A PLACE TO DISCOVER

Combining the atmosphere of a small New England liberal arts college with the resources and opportunities of a major research university, the University of New Hampshire is a place where all students can find or create their own niche and succeed.

From classroom to coastline, the driving force at UNH is the spirit of discovery. Discovery describes the core educational experience we provide for students, in which new knowledge, ways of thinking, problem-solving skills, and skills of citizenship are acquired and practiced.

UNIVERSITY of NEW HAMPSHIRE

Undergraduate Catalog 2007–2008 BULLETIN
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Introduction

What makes the University of New Hampshire (UNH) a great institution? Every day, brilliant, dedicated, inventive, hard-working people come together to teach, learn, and discover, always with an entrepreneurial spirit that has made many of our academic and research programs world-class. They are motivated by passion, by a spirit of inquiry, and by a desire to give back to their communities.

What makes UNH outstanding is that we combine the “best of both worlds.” We offer students the living and learning environment of a small New England liberal arts college with the breadth, spirit of discovery, and civic commitment of a land-, sea-, and space-grant research university. This is rare among American institutions of higher education, and students and faculty will tell you it is our greatest asset.

The University Today

Today the University of New Hampshire is made up of dozens of academic departments, interdisciplinary institutes, and research centers that attract students and faculty from around the world. As state-of-the-art facilities are built to support academic growth, and new residence and dining halls are built to meet the growing popularity of campus life, the University continues to rest lightly on the Durham landscape. Some 13,000 students and hundreds of faculty and staff live and work amid the rolling hills and riverbeds of one of the most beautiful campuses in the nation.

The University of New Hampshire is strong and highly responsive to the needs of its public mandate—one that increasingly results in productive partnerships not only with the state, but the region and nation. The University of today has met its greatest expectations and stands on the threshold of unlimited possibilities.

Look around the University today: what you see is not one, but a great many communities brought together in the process—at once profoundly personal and inextricably social—of discovery and engagement concerning issues of the greatest public importance.

You see a campus in which world-class research centers and laboratories, graduate seminars, undergraduate honors classes, service-learning projects, and student internships have mobilized the University’s capacities for teaching, research, and partnership building.

You see faculty and students from health and human services and liberal arts working as part of the Carsey Institute to undertake applied and policy research on improving the quality of family life. You see the University’s working scientists, mathematicians, engineers, and educators engaging in the Joan and James Leitzel Center to improve mathematics, science, and engineering education from kindergarten through college. You see researchers come together from across the University to undertake a ground-breaking study of the complexities of improving the region’s air quality in the era of modern industry.

A Powerful Linking of Teaching and Research

Where the University of New Hampshire has linked teaching and research programs with the practical realities of life, it has set the international standard with centers and institutes whose names have become synonymous with excellence in such fields as computer interoperability, ocean mapping, child study and development, and experiential education.

Such research power translates into exceptional educational opportunities for our talented students. The University prides itself on graduating students who have undertaken significant research. In recent years hundreds of students, from all disciplines, have experienced the thrill of designing their own research projects, collaborating with faculty, and presenting their findings in a public forum. Robust undergraduate research programs enable students to conduct research year-round, as freshmen and seniors, on campus and around the world.

The University’s international research opportunities program was the first of its kind and serves as a model for others nationwide. Today the internationalization of the University is an accomplished fact. The study abroad program and international studies major are strong and growing. Faculty are in demand as visiting professors at universities around the globe (many as Fulbright Fellows), and bring their experiences back to Durham.

Mission

UNH offers a broad array of undergraduate, professional, and research and graduate programs. Nearly ninety percent of the full-time faculty members hold doctoral or terminal degrees, and many have earned national and international reputations.

The University of New Hampshire has a threefold mission: the scholarly functions of teaching, research, and public service.

Teaching. All undergraduate programs of instruction at the University are built on a program of general education. The objec-
tives of general education carry through the undergraduate subject major, as students refine and apply their skills and discover the relationships among fields of study. At every level, students enjoy close contact with individual faculty members who are dedicated to research and scholarship; this is an advantage for students, because active scholars and researchers teach by sharing their own learning.

**Research.** The activity of research embraces all the arts and sciences at the University: it is an integral part of both undergraduate and graduate programs. In doctoral study, and in many master's programs, thesis research is a primary mode of learning. As a land-, sea-, and space-grant institution, the University of New Hampshire has a special obligation to conduct applied research in the areas of agriculture, marine sciences, and engineering, and to disseminate the findings to the state and nation.

**Public Service.** The University fulfills its special responsibility for the welfare of the state through UNH Cooperative Extension, through the Office of Continuing Education and Summer Session, and through research and consultation on particular needs of New Hampshire citizens. The University is dedicated to collaborative learning inside and outside the classroom.

**The UNH Library**

The UNH 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 more than a million volumes and 6,000 periodical subscriptions, the library has government publications, maps, sound recordings, compact discs, video cassettes, DVDs, and manuscripts. The library offers extensive electronic resources including indexes in a wide variety of subject areas, databases supplying full-text periodical and newspaper articles, and statistical data sets. Experienced librarians and staff provide expert service to people seeking information or research assistance.

The library is a member of the elite Boston Library Consortium, whose members include some of the most well-known research institutions in the nation. Through the consortium, UNH faculty, faculty emeriti, students, and staff at both the Durham and Manchester campuses have full access to a combined collection of more than 31 million volumes via interlibrary loan and on-site visits to member libraries.

The Dimond Library offers three grand reading rooms, seating for 1,200, 21 miles of shelving for books, and the Dimond Academic Commons (DAC). The DAC (Main Floor) features "one-stop" shopping for information needs, including reference assistance, IT help, high-tech equipment, and collaborative work space. Wireless access, computer workstations, and laptop hookups are available throughout the building.

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, the Engineering/Mathematics/Computer Science Library is in Kingsbury Hall, and the Physics Library is in Nesmith Hall. All branches have reserve materials, reference collections, circulating collections, periodicals, and electronic resources. All branch materials are indicated in the UNH Library catalog.

For more information on Dimond and the branch libraries, visit www.library.unh.edu.

**The Campus**

The home of the main campus of the University is Durham—one of the oldest towns in northern New England—near the picturesque seacoast of New Hampshire. 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 natural open space among the buildings. College Woods, on the edge of campus, includes five miles of well-kept paths through 260 acres of forest.

During the last decade, major building and renovation projects have revitalized the UNH campus while maintaining its traditions. In 2002, the University celebrated the completion of Mills Hall, its newest and very beautiful residence hall; 2003 saw completion of the new Holloway Dining Commons. Renovations of Murkland and Congreve Halls have also been completed. The soon-to-be-completed Kingsbury Hall renovation and expansion project will give science students new project space, a modern lab wing, and high-tech classrooms.

In 2004, UNH was named one of the Top 25 Most Entrepreneurial Colleges by The Princeton Review and Forbes.com, ranking 10th in the nation.

Admission

UNH welcomes campus visitors. Prospective students are encouraged to contact the Office of Admissions in order to arrange a campus tour and/or group information session. Campus tours are led by student admissions representatives who provide a general overview of academic programs and campus life opportunities. Professional staff members are available to provide information about the criteria used by the Admissions Committee in reviewing candidates and to address specific concerns. Please call the Office of Admissions at (603) 862-1360 for further information or to schedule a visit, or visit the Web at www.unh.edu/admissions.

Academics

UNH's ranking was based on the efforts of the Whittier School of Business and Economics. UNH was the only public university in the Northeast to make the top 10.

**Accreditation**

The University of New Hampshire is accredited by the New England Association of Schools and Colleges, Inc., which accredits schools and colleges in the six New England states. Accreditation by the association indicates that the institution has been carefully evaluated and found to meet standards agreed upon by qualified educators. Specialized programs of study are also accredited by various professional organizations.

All degree programs at the University are approved for veterans' educational benefits. Individuals are encouraged to contact the veterans coordinator in Stoke Hall about specific questions.

The University supports the efforts of secondary school officials and governing bodies to have their schools achieve regional accredited status to provide reliable assurance of the quality of the educational preparation of its applicants for admission.

**Admission Criteria**

Admission to a bachelor's degree program is based upon successful completion of a strong secondary school program of college preparatory coursework. Primary consideration is given to the academic record, as demonstrated by the quality of candidates' secondary school course selections and achievement, recommendations, and the results of the SAT and/or ACT exam. Consideration is also given to character, initiative, leadership, and special talents.
Most successful candidates present at least four years of English and mathematics, three or more years of laboratory science, three or more years of social science, and two years of study in a single foreign language. Three years of a single foreign language are preferred. Recommended mathematics preparation includes the equivalent of algebra I, geometry, algebra II, and trigonometry or advanced math.

Students who plan to specialize in engineering, biological/physical science, mathematics, or forestry should present at least four years of mathematics including trigonometry, as well as laboratory coursework in chemistry and/or physics. Students pursuing business-related studies should have also completed four years of mathematics including trigonometry. For students planning to major in health-related disciplines, four years of math, as well as laboratory courses in biology and chemistry, are strongly recommended.

Applicants may indicate a prospective major on the application for admission. An undecided applicant may apply for admission into a bachelor's program as an "undeclared" student to any one of the University's five school and college divisions in Durham and at UNH Manchester.

(For information concerning bachelor and associate degree programs offered through UNH Manchester, see page 131; for information concerning the Thompson School of Applied Science, see page 121.)

Many University students request a change in major during their undergraduate years, and most are approved. These changes are possible after a student has been at the University for at least a semester and has permission from the appropriate college dean and department chairperson. In recent years, however, the University has not always been able to honor all requests for a change of major, most notably into nursing or occupational therapy.

Admission Test Requirements
All candidates for admission to bachelor's degree programs are required to submit the results of the SAT or ACT exam, both with essays. Applicants graduating from high school in 2006 or later must submit SAT or ACT results with the new essay portion. SAT subject tests are not required, but a foreign language subject test may satisfy the foreign language requirement of the bachelor of arts degree. Required scores vary by test.

International students whose primary language is not English must submit the results of a Test of English as a Foreign Language (TOEFL). The recommended minimum TOEFL score is 213 (computer version) or 550 (paper version) or 80 (Internet version).

Music Candidates
Candidates applying for programs in the Department of Music must make arrangements with the department chairperson for an audition (603) 862-2404. Details regarding audition requirements may be obtained from the department.

Admission Deadlines
The Admissions Office welcomes high school students who seek fall semester freshman admission to apply any time after the start of the senior year and before the February 1 priority deadline. Admission notifications are provided on a continuous basis through April 15th. Admitted freshmen have until May 1 to confirm their intent to enroll at the University.

The review of freshman candidates begins as soon as a complete application (including official grade reports through the first marking period of senior year and a confirmed senior-year course schedule, the results of the SAT or ACT, and a letter of recommendation) is on hand. To apply ensuring early action (an "early reading" by mid-January of the senior year), candidates must submit admission applications by November 15. In some cases, the Admission Committee will request senior mid-year grade reports in order to make a final admission decision.

All positive admission decisions made prior to the completion of a candidate's coursework in progress are considered "provisional" and are subject to the verification of satisfactory senior year achievement when final high school transcripts are reviewed by the Admission Committee.

Accepted candidates are required to confirm their intention to enroll with the payment of an enrollment fee by May 1. An additional deposit is required by May 1 to reserve on-campus housing.

Deferred Admission
The University considers applicants for deferred admission, which enables students to reserve a space at the University while taking time off from school for work or travel. The University may not be able to offer deferred admission in certain program areas.

Advanced Standing
The University recognizes outstanding secondary school work by means of advanced placement and credit for those who have taken enriched or accelerated courses before entering college. Applicants qualify for such credit by successfully completing course-work for college credit and satisfactory achievement on University approved placement examinations, including the College Board Advanced Placement (AP) Tests, International Baccalaureate (IB) Higher Level Examination Test Results, or through the College Level Examination Program (CLEP).

The University accepts AP Tests in every subject area, with credit and course equivalency based on the score achieved. Contact the Office of Admissions for further information (603) 862-1360 or visit www.unh.edu/admissions/ap.

The University awards 8 semester credits for each IB Higher Level Examination Test Results of 5, 6, or 7. Students should have official results sent directly to the Admission Office. The University recognizes up to 32 semester credits of CLEP General Examination tests which may be applied as elective credit only. Scores must be 500 or better in the humanities, natural sciences, and social sciences-history exams. The minimum score for mathematics is 500 and for the English exam with essay, 500. Subject exams, when applicable, may be used to satisfy either departmental or general education requirements. UNH does not accept all CLEP subject exams.

Maximum credit accepted for all credit by exam and advanced placement testing is 64 semester hours.

Associate Degree Candidacy
The University accepts candidates for associate in applied science degree programs who have demonstrated ability and motivation for learning through academic achievement, work experience, and/or military service.

Students may be considered for admission to associate in applied science degree programs offered by the University's Thompson School of Applied Science. Candidates applying as high school seniors must submit the results of the SAT or ACT, both with essay. Students granted freshman admission to the Thompson School are eligible to live in a University residence hall.

Eligibility for Degree Candidacy
Applicants who meet the appropriate requirements for admission may become candidates for any undergraduate degree offered by the University. However, applicants having a bachelor of arts degree will not be admitted into a program of study that
awards the same degree (e.g., B.A., History, and B.A., Zoology). Applicants can earn more than one bachelor of science (B.S.) degree, provided that each degree is in a different field. Applicants may also be admitted into a program awarding a different degree (e.g., B.A., History, and B.S., Biology; or B.A., History, and A.A.S., Applied Business Management).

**Readmission**

An undergraduate who withdraws, does not register for UNH coursework in a given semester, or is suspended or dismissed from the University thereby terminates degree candidacy and must apply for readmission by the following deadlines: fall semester, June 1; spring semester, November 1. Readmission applications are processed in the Office of Admissions; however, decisions regarding readmission are made in consultation with the Division of Student Affairs and the dean’s office of the University college division to which the student is applying.

Before seeking readmission, students on academic suspension must remain away from school for at least one semester. Applications from suspended students should include a statement about the applicant’s readiness to resume University work.

Only under extraordinary circumstances will students be readmitted after dismissal for academic reasons. Applications submitted by dismissed students are reviewed by the University’s Academic Standards and Advising Committee.

It may not be possible for readmission applicants to enroll in programs with established enrollment limitations.

**Transfer Students**

UNH encourages applications from transfer students. Admission consideration includes review of course selection, academic achievement, and the extent to which that selection addresses the University’s general education requirements. Transfer credit is awarded for completed courses with a grade of C or better, provided those courses are comparable to courses offered at UNH. Each course must carry at least 3 semester credits to qualify for general education consideration. Transfer credit evaluations are provided with the offer of admission.

Students enrolled in one of the University’s associate degree programs who desire admission to a bachelor’s degree program at UNH apply as transfer students through the Office of Admissions.

Some programs may have enrollment limitations. Transfer students may contact the Department of Housing (603) 862-2120 to determine the availability of on-campus housing or (603) 862-0303 for assistance locating off-campus housing.

Priority deadlines for transfer applicants are October 15 for the spring semester and March 1 for the fall semester.

No portion of a student’s grade-point average will transfer; that is, external averages will not be calculated with UNH grades.

**New England Regional Student Program**

The University participates in the New England Regional Student Program, in which each public college and university in New England offers certain undergraduate majors to students from other New England states. Under this program, admitted students pay the UNH in-state tuition plus an additional percentage. Students must indicate on the application the specific major for which they are applying. Information about the curricula may be obtained from the New England Board of Higher Education, 45 Temple Place, Boston, MA 02111, or call (617) 357-9620, www.nelhe.org.

**Special Student Status**

UNH offers a special student classification for persons who wish to participate in University coursework on a full-time basis without entering a degree program. Special (non-degree) students register for coursework through the Registrar’s Office. In evaluating requests for full-time status, the Office of Admissions generally applies the same criteria used in the review of applicants for admission to degree candidacy. Special students have full access to academic support services. Students must maintain satisfactory achievement to continue with University coursework.

**Resident Status**

All students attending any division of UNH in any capacity shall be charged tuition at a rate to be determined by their primary, legal domicile. Those domiciled within the state of New Hampshire pay the in-state rate. Those domiciled elsewhere pay the out-of-state rate.

Students are classified as residents or nonresidents for tuition purposes at the time of admission to the University. The decisions, made by the Office of Admissions, are based upon information furnished in students’ applications and any other relevant information.

All applicants living in New Hampshire are required to submit a notarized statement to the effect that they, if financially independent, or their parents, if financially dependent, have been legally domiciled in New Hampshire continuously for a period of at least twelve months immediately prior to registering for the term for which the student is claiming in-state status. Students admitted from states other than New Hampshire or from foreign countries are considered nonresident throughout their attendance at the University unless they have acquired bona fide domicile in New Hampshire.

If students maintain residency apart from that of their parents, they must clearly establish that they are financially independent and that their residence in New Hampshire is for some purpose other than the temporary one of obtaining an education at the University.

To qualify for in-state status, students must have been legally domiciled in New Hampshire continuously for a period of at least twelve months prior to registering for the term for which in-state status is claimed.

The burden of proof in all cases is upon the applicant. The University reserves the right to make the final decision concerning resident status for tuition purposes.

A copy of the rules governing residency may be obtained from the Office of Admissions.

**Financial Aid**

The University Financial Aid Office assists students who are unable to meet educational expenses entirely from their own family resources. Aid is available in the form of grants and scholarships, loans, and part-time employment. The financial aid brochure gives program information, application procedures, and deadlines.

In many communities, scholarships and loans are available locally. School principals and guidance counselors have information about these sources of assistance, which are available to both high school seniors and adult students.

Before applicants may be considered for assistance by the University, they must submit the Free Application for Federal Student Aid (FAFSA). Applicants may obtain the FAFSA from local high schools or from the UNH Financial Aid Office.

The financial aid application deadline for aid awarded by the University is March 1. This is the date by which your fully completed FAFSA must be received by the federal processor.

The importance of meeting this deadline cannot be overstated. While there are some types of aid (e.g., Pell Grants and Stafford
Loans) for which you may apply after this deadline, it is likely that you will receive substantially less total aid if your application is late. For the past several years, applicants applying after the deadline did not receive any aid awarded by UNH (SEOG, tuition grant, Perkins Loan, or work study).

It is the University's position that the student applicant is accountable for the accuracy and timely submission of the FAFSA. We realize that in most cases a student's parent(s) also participates in completing the form. However, it is the student who is ultimately responsible for monitoring the application process. Students should not wait until being admitted to the University before applying for financial aid.

Note: There is reference on the FAFSA to a "deadline" of May 1. Do not be misled by this date. It is not the financial aid deadline at UNH or most other colleges.

Grants and Scholarships
Admitted undergraduate degree candidates who will attend UNH on a full- or part-time basis may be considered for tuition grants and University scholarships. The basic consideration is financial need, although some scholarships are awarded on the basis of scholastic attainment, participation in extracurricular activities, or meeting specific requirements of a donor.

The University participates in the federally sponsored Federal Supplemental Educational Opportunity Grant Program, which is designed to assist needy students who are admitted degree candidates.

Federal Pell Grant Program
Students may apply directly to the federal government for a Pell Grant using the FAFSA. Students must reapply each year for a grant.

Loan Programs
Two loan funds are administered by the University: UNH Loan Fund and Federal Perkins Loans. Admitted undergraduate and graduate degree candidates who will attend the University on at least a half-time basis may be considered for these loans. Financial need must be clearly demonstrated, and loans may be used only for educational expenses.

Most states now have higher education loan plans established by the Higher Education Act of 1965. Contact your local bank, other lender, or the Financial Aid Office for information.

Part-Time Employment
The Federal Work-Study Program, both academic year and summer, assists students who, as determined by the Financial Aid Office, need financial assistance for their educational expenses. Admitted undergraduate and graduate degree candidates attending at least half time are eligible for consideration.

Students who do not qualify for the Work-Study Program may find part-time employment on or near campus.

ROTC Scholarships
Reserve Officer Training Corps scholarships are offered on a competitive basis by both the Army and the Air Force. Entering freshmen may compete for four-year scholarships during the last year of high school. A variety of scholarships are also available to students already attending the University.

Scholarships pay up to full tuition, all mandatory fees, and required textbooks. In addition, all scholarship recipients receive a tax-free monthly subsistence allowance. Finally, students with a four-year or three-year ROTC scholarship compete for a room and board grant for the entire time they are on the scholarship.

For more information, contact the Admission Office: Army ROTC, at (603) 862-1078 or the Air Force, at (603) 862-1480.

Campus Life
At the University of New Hampshire, getting involved is a big part of campus life. Inside the classroom and beyond, UNH students bring energy and passion to everything they do.

Housing
The University offers students a variety of housing options, including small halls of approximately 100 students to medium halls and large halls (ranging from 400 to 600 students). Our newest residence halls offer students suite style living ranging from four to eight person suites. Upperclass undergraduates may also choose from either of two on-campus apartment complexes: the Gables and Woodside apartments. These apartment complexes are designed to meet the more independent and self-reliant lifestyles of upperclass students. Theme-based housing is offered in many buildings on campus. Some of our programs are located in the minidorms, where each house focuses on a theme, and Smith Hall, where the focus is on international and intercultural activities. There is also a residence hall for students participating in SELF (Students Electing to Live Free), a program whose participants have chosen not to use alcohol or any chemical substances.

The Department of Housing and the Residential Life Office are committed to providing a living environment that maintains high standards of health and safety. Full-time professional directors manage the residence halls and work with a student staff to offer special programs and enforce hall standards.

Undergraduate University housing is available to all full-time baccalaureate degree candidates and to associate in applied science degree candidates. Offers of housing to associate in arts degree and Division of Continuing Education students are made on a case-by-case basis. Students are not required to live on campus.

Offers for on-campus housing are sent to all accepted new freshmen. Transfer and readmitted students may apply for housing upon admission to the University. Offers will be made on a space-available basis. All application materials are available at the Department of Housing located in Pettee House.

For more information, contact the Department of Housing (603) 862-2120 or visit the department's Web site at www.unh.edu/housing/.

Dining
UNH Dining is committed to exceeding the expectations of our guests and takes pride in maintaining our position as a leader in the food service industry. The freshest ingredients, flexible menus, various meal plans, and special events have earned us over 20 awards presented by the National Association of College and University Food Services. Flexible meal plans give students the option of eating at one of the three dining halls or using Dining Dollars or Cat's Cache at one of six retail locations around campus. Our three dining halls serve all-you-care-to-eat meals in comfort. Menu choices include popular favorites such as pizza, burgers, and stir-fry as well as vegan and vegetarian options, a well-stocked deli, and tremendous salad bars. Fresh-baked breads, desserts, and other selections are also available. Students who have dietary needs or concerns can meet with a registered dietician and executive chef to review menu selections. Parents can send goodie packages or personalized birthday cakes to students. As a land-grant University, UNH is committed to supporting and advancing the state's agricultural economy. Small, family farms are not only
part of the state’s heritage, but play a vital, active role in current economy and culture. In recognition of the many benefits a vibrant agriculture affords in New Hampshire, our sustainability efforts raise awareness and educate students, staff, and community members about the local agricultural landscape and its role in sustaining physical and economic health and well-being, now and in the future.

Memorial Union Building

The Memorial Union Building (MUB) is the University’s community center and is the official war memorial of the state of New Hampshire. The MUB provides opportunities for student involvement and offers space for programs, meetings, and study, as well as for major public events, movies, and other entertainment. Students, faculty, and staff serve on the Memorial Union Board of Governors and work with the director to set policies and establish the budget for the building’s operation. The original building was a gift from UNH alumni and first opened its doors in 1957. Currently, the MUB has complete wireless capabilities in all public spaces and meeting rooms.

Headquartered in the MUB are the Information Center; Office of Multicultural Student Affairs, two movie theaters; the UNH Copy Center; the UNH Bookstore; the Ticket Office; specific lounge/study space for nontraditional, commuter and graduate students; and Granite Square Station & Shipping, which provides undergraduate mail boxes and UPS shipping service. Computing and Information Services provides a computer cluster and Help Desk with walk-in service. The Games Room is equipped with pool and ping pong tables. The Entertainment Center and Wildcat Den provide a comfortable atmosphere for relaxing with live acoustic performances as well as socializing and study space. The Food Court offers expanded dining options, and food service is also available at the Coffee Office. The Student Senate Office, WUNH-radio, The New Hampshire (the student newspaper), and nearly 60 other student organizations have office space in the MUB.

The Leadership Center (MUB 122) currently serves as the hub for student involvement at the University of New Hampshire and is home to four offices: Greek Affairs, Off-Campus & Commuter Student Services, Student Organization Services, and Project LEAD. Whether a student is interested in joining a student organization or starting a new one, participating in one of many leadership development programs, or simply learning about campus resources—this is the place! Student and professional staff members oversee the University recognition process for all student organizations and are available for advising or training on topics related to organizational development and program planning.

Off-Campus and Commuter Student Services strives to connect the half of the student population who do not live in University housing to campus. Programs, such as Good Morning Commuters and the Commuter Connection listerv, bring information to students about campus happenings, events, and activities. Off-Campus and Commuter Services also helps students understand the ins and outs of moving off campus by providing educational sessions in the residence halls.

Recognized student organizations and University departments are encouraged to use rooms in the MUB. Reservations can be arranged via the scheduling Web site www.unh.edu/mubscheduling, calling MUB Scheduling at (603) 862-1526, or stopping in the Office of the Memorial Union to fill out a form. For a complete listing of Memorial Union programs, services, and events, phone the Information Center at (603) 862-2600 or visit the Web site at www.unhmub.com.

Cultural Events

Students at the University can participate in a rich cultural life. Numerous lectures, films, concerts, exhibitions, meet-the-artist receptions, master classes, dance performances, and theatrical productions are offered throughout the year. The UNH Celebrity Series, the Art Gallery, and the Departments of Music, Theatre and Dance, and Art and Art History bring artists of international stature to campus.

The fine and performing arts are an integral part of undergraduate education. Programs are frequently incorporated into coursework. For further information or a brochure call the numbers listed below:

- **Department of Music** (603) 862-2404
- **The Art Gallery** (603) 862-3712
- **Art and Art History** (603) 862-2190
- **Theatre and Dance** (603) 862-2919
- **UNH Celebrity Series** (603) 862-3242 or www.unh.edu/celebrity
- **Traditional Jazz Series** (603) 862-2404
- **Memorial Union Ticket Office** (603) 862-2290 or www.unhmub.com

Campus Recreation

Many opportunities for leisure activities, regardless of skill or ability, are offered through Campus Recreation. The Hamel Student Recreation Center is available to all full-time matriculating students and recreation pass holders, seven days a week (excluding UNH holidays and shutdowns). The center offers participants two multipurpose courts, a group exercise studio, club/martial art studio, an 8,000 square foot fitness center with more than 100 exercise stations, with cardio-theater including five TVs, three basketball/volleyball courts, an indoor track, a lounge, several classrooms, locker rooms, towel and lock service at the equipment room, saunas, and synthetic sports fields. The Department of Campus Recreation offers a variety of activities designed to make it easier to reach personal fitness goals and have fun. Participants may take part in one of the many group exercise classes such as step aerobics, Reebok cycling, water aerobics, or cardio kickboxing. Other opportunities include yoga, pilates, racquetball, personal training, massage therapy, or running in the Homecoming 5K Race. Noncredit courses are also offered including CPR and First Aid, and many more. Recently a climbing boulder was added for those perfecting their climbing skills. Many outdoor adventure trips are also available each year.

The intramural sports program consists of 25 different sports and activities offered to co-rec, men's and women's teams. Intramural sports are organized, competitive leagues and tournaments officiated by trained students. These activities generally take place Sunday through Thursday and are 3-7 week leagues or short elimination tournaments. The Department of Campus Recreation assists special interest groups or sport club teams to reflect the varied recreation and cultural preferences of campus community members. Some of the 27 clubs are intensely competitive, requiring a daily commitment to workouts and conditioning. They compete either on an inter-collegiate basis with New England teams or sponsor University tournaments. Other clubs meet on a casual “come when you can” basis. The wide variety of clubs can meet every interest or skill level.

Campus Recreation also operates the Swazey indoor pool (located in the field house) and the UNH outdoor pool. The indoor pool is an 8-lane by 25-yard facility with 1- and 3-meter diving boards. Offerings include many open swim hours, water aerobics classes, American Red Cross courses and swim lessons, masters swimming, and many other programs/events/rentals.
The UNH outdoor pool is located beside the recreation center and is operated seasonally and hosts several special events throughout the summer. Offerings include private and group swim lessons, masters swimming, birthday party rentals, and other special events.

In addition to the Recreation Center, the Department of Campus Recreation offers ice skating in the Whittemore Center arena, manages a large outdoor recreation facility on Mendum's Pond in Barrington with its own sailing and canoe center, runs the Department of Campus Recreation arena, manages a large outdoor recreation facility on Mendum's Pond in Barrington and supports the men's crew boat house. One of the largest student employers on campus, Department of Campus Recreation provides opportunities for more than 300 student employees in a variety of positions. For further information call (603) 862-2031 or visit campsusrec.unh.edu.

Programs and Services for Students

From international education to residential life, academic advising to internships and writing, the University offers programs and services to help every student get the most out of their college experience.

Advising Services

Every UNH student is assigned an academic adviser, who provides help in choosing courses and planning a program of study. Each college within the University also has an advising office. Other sources of help, for academic or personal problems, are described below.

Center for Academic Resources (CFAR)

The Center for Academic Resources offers a comprehensive program of academic-related services to undergraduate students. Participants work on an individual basis or in group seminars with trained staff members to improve their academic performance and enhance their educational experience. The center offers learning skills instruction, drop-in subject area tutoring, study groups, computer usage, course information, clarification of academic goals, personal advising, and referral. The center serves approximately 1,600 students a year. There is no cost associated with these services.

Additional services are available through the Student Support Services component for students enrolled in four-year programs who meet income and disability criteria. These services include individualized subject-area tutoring, support for students with learning disabilities, graduate school advising and preparation, computer support, and scholarship search assistance. Student Support Services is 82 percent federally funded through a $303,868 grant from the U.S. Department of Education. UNH contributes 18 percent or $67,236 as matching funds.

Located at Wolff House (8 Ballard Street, next to Health Services), the center is open weekdays from 8:00 a.m. to 4:30 p.m. and evenings by appointment. For further information call (603) 862-3698 (voice/TTY), fax (603) 862-0840, or visit the Web site at www.cfar.unh.edu.

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/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 by calling the Counseling Center at (603) 862-2090. When necessary, the center’s staff assists with outside mental health referrals.

The staff, which includes licensed 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. The Counseling Center is fully accredited by the International Association of Counseling Services, Inc. and offers a predoctoral internship training program that is accredited by the American Psychological Association.

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 Counseling Center’s Web site at www.unhcc.unh.edu/index.html.

Athletics, Men’s and Women’s

UNH participates in the following intercollegiate men’s athletics programs: basketball, cross country, football, hockey, soccer, swimming, track and field, and volleyball. An undergraduate athletic pass provides access to certain sporting events on a space available basis. (See also Campus Recreation, page 7.)

Cat’s Cache

Cat’s Cache is a debit account accessed with a UNH ID card. Cat’s Cache is a convenient way to make purchases on-campus at many locations including all UNH dining operations, the UNH bookstore, and most vending machines, the Acorns Restaurant at the New England Center, the pro shop at the Hamel Recreation center, and many off-campus merchants. There are no minimums, no fees, and no penalty for withdrawals. Account balances carry from semester to semester and year to year. Cat’s Cache is available to all campus community members including students, faculty, and staff.

All UNH ID cardholders have a Cat’s Cache account. To make a deposit, use one of our convenient account management centers with cash or a credit or debit card, at onlinecardoffice.com/unh with a credit or debit card, or in person at the Dinning and ID Office located in Room 101 of Halloway Commons with cash or a check. You may also make deposits through the on-line remittance form during eligible periods.

Cat’s Cache is intended for purchases and not for cash withdrawals as an ATM card would allow. You cannot withdraw cash from your account unless you withdraw the entire amount. For more information about Cat’s Cache, visit www.unh.edu/dining and follow the Cat’s Cache links.

Computing and Information Services

www.unh.edu/cis

Computer access. All students have access to networked computing resources on campus. UNH has five student computing clusters that offer more than 200 computer systems running Windows XP, Mac OS X, and Linux, as well as scanners and high-speed laser printers. All clusters are completely networked, offer a suite of productivity and design software, provide access to the World Wide Web and other Internet resources, and give students personal network storage for documents. The clusters are staffed by student consultants who assist with questions or problems. One location is available 24 hours a day. For information and cluster hours, call (603) 862-0058 for an automated recording, or visit clusters.unh.edu.
Training. Each semester, courses are offered on a variety of topics. Register for a course via the Web at training.unh.edu. For more information, call (603) 862-4242.

Purchase and repair. Students may purchase their own computers at the UNH Computer Store, which sells Apple and Dell computers; Apple, Epson, Dell, 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 is located at the CIS Center, Hewitt Annex, 54 College Road. The computer service center has a customer service counter at the MUB, room 201.

CIS Help Desk and Dispatch Center. As a unit of Help Desk Professional Services, the CIS Help Desk and Dispatch Center provides UNH and USNH faculty, students, and staff with a centralized contact point for computer-related questions and concerns. Telephone consulting to address inquiries on various computer applications is available at (603) 862-4242. Inquiries may also be made online at www.unh.edu/HelpDesk. Supported products include Macintosh and Windows-compatible software, communication and network products, Internet utilities, central computer applications, and USNH central administrative software applications. For a list of CIS-supported products, go to www.unh.edu/supported-products/. The Help Desk and Dispatch Center also provides central UNH computer-user accounts administration and support as well as UNH network connection problem assistance.

Walk-In Services. CIS Telecommunications and Client Services coordinates Walk-In Services, located at MUB 109. Walk-In Services offers kiosks for e-mail access, Web browsing, and CIS Knowledge Base searches. Staff is available to discuss UNH computing and voice communication-related issues, including central system account distribution, voice mail and account password resets, virus scanning services, wireless connectivity, file conversion, and disk/file repair and recovery. Walk-In Services also distributes CD Loaner Kits containing the latest anti-virus software and UNH network software programs.

ResNet. UNH's Residential Network provides a high speed network connection, as well as anti-virus and spyware educational programs, for each student living in the residence halls and undergraduate apartments on campus. There are no monthly fees or time limits for using ResNet. There are minimum standards for hardware and software. For information, visit the ResNet Web site at at.unh.edu/resnet.

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

Disability Services for Students
The University of New Hampshire is committed to providing students with documented disabilities equal access to University programs and facilities. The University will make reasonable accommodations to promote student independence and access to the full range of college activities at UNH.

All students with a disability who anticipate the need for services, should self-identify and provide written documentation to Disability Services for Students. Please submit documentation as soon as possible after acceptance to smooth coordination of available services. Documentation requirements are available at www.unh.edu/disability-services. Disability Services is located in the Memorial Union Building, room 118, (603) 862-2607 (voice/TTY).

General Information for Students with Disabilities
Students seeking accommodations, assistive technology, or arrangements for accessible classroom locations should contact Disability Services for Students at (603) 862-2607 (voice/TTY).

Most major buildings have ramps and many have elevators and adapted restroom facilities. Contact Disability Services or Affirmative Action with questions about building facilities.

Students with disabilities who require handicap parking permits for on-campus use must seek the permits from the Department of Motor Vehicles (DMV) of their home state (that is, the state where their driver's license was issued). Applications for New Hampshire handicap permits are available at Parking Services. Processing of New Hampshire permits, however, must still be done by the DMV of the student's home state. Please note: All students using handicap parking permits must still purchase either a commuter or on-campus resident pass. Questions about temporary handicap parking should be directed to Parking Services at (603) 862-1010.

For more information about dietary restrictions due to disability please contact Food Service: University Hospitality Services at (603) 862-2583.

Students with disabilities who need accessible housing and plan to live in campus residence halls should contact Housing early to allow for timely arrangements of appropriate rooms and location. Please contact Housing at (603) 862-2120.

UNH has specifically-equipped vans with lifts which transport students on campus to other locations along the Wildcat transit routes. For information on this service or for special arrangements possible during periods of inclement weather, please contact Wildcat Access (formally known as Handivan) at (603) 862-2630.

All B.A. candidates must fulfill the University's foreign language requirement by the end of their sophomore year. A student with a documented disability may petition the foreign language board for course substitutions on the basis that the disability will prevent her from successfully mastering the foreign language requirement. Students wishing to pursue this process must contact Disability Services for Students.

No otherwise qualified individual may be excluded from or denied access to any program, course of study, or any other offering of the University, solely on the basis of a disability. Concerns regarding the institution's compliance with the Americans with Disabilities Act (ADA), or Section 504 of the Rehabilitation Act of 1973 should be addressed to the ADA/504 Compliance Officer, Affirmative Action Office at (603) 862-2930 (Voice/TTY).

Greek Life at UNH
Greek life at UNH has a long and rich history, with the first fraternity founded in 1896 and the first sorority founded in 1913. Today the Greek community at UNH has more than 800 members, which is about 8 percent of the student body. The Greek System is comprised of five national sororities, seven national fraternities, and one local fraternity, all governed by the Interfraternity and Panhellenic Councils. These organizations commit themselves to the values of scholarship and academics, leadership and campus/community involvement, social development, philanthropy and community service, and brotherhood and sisterhood. Fraternities and sororities are special living and learning environments providing members with hands-on
General Information

experience in developing leadership, organization, and communication skills. Greek life can enhance the college experience with long-lasting friendships and the special bonds of brotherhood and sisterhood.

The Office of Greek Affairs directly supervises the governing councils and individual chapters. This office is staffed by a full-time coordinator and various part-time and volunteer assistants. Any questions regarding membership in these organizations can be directed in person to the Office of Greek Affairs, 122A Memorial Union Building, or by phone, (603) 862-1002.

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 site at www.unh.edu/oiss. To schedule an appointment, call (603) 862-1288 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.

Multicultural Student Affairs
The Office of Multicultural Student Affairs (OMSA) creates opportunities for people to participate in an inclusive community and to explore and understand diversity, injustice, and equity. Their work is grounded in an understanding of diversity that includes people of all abilities, ages, ethnicities, genders, nationalities, races, religions/spiritual traditions, socioeconomic classes, and sexualities.

Providing support and development for students of color (Asian/Asian American/Pacific Islander, Black, Middle Eastern, Latino/a, Native American, Biracial/Multiracial), and for lesbian, gay, bisexual, transgender, questioning (LGBTQ) and allied students, OMSA offers cultural and educational programs which encourage leadership potential within a multicultural context, provides referrals to obtain support and help from other people and programs on campus, gets students connected, helps students to learn more about race, sexuality, and gender, responds to acts of intolerance, and helps all members of the University Community to feel safe and welcome at UNH.

The Office of Conduct and Mediation at (603) 862-3377, or visit the Web site at www.unh.edu/ocm.

The UNH Mediation Program provides community members with an opportunity to talk about and resolve disputes in an alternative and non-adversarial manner. Students or University community members or organizations can access mediation or conflict resolution training or consultation by self-referral. Mediation and/or conflict resolution training or consultation is also available as an alternative to filing conduct charges against a student in some situations. Mediation is provided by trained neutral mediators, who are in charge of and guide the process in a neutral setting and confidential process. The mediators are not involved in the dispute, do not take sides, and do not make any decision for the disputants. The mediators are part of this community-based mediation program and are supervised by the Office of Conduct and Mediation Programs. Some examples of situations appropriate for mediation include issues arising out of relationships such as roommate, friendships, dating partners, neighbors, teammates, organization members, landlord/tenants, etc. Through mediation, disputants are able to identify the issues in a conflict, have their perspective heard and acknowledged, and communicate about how to better understand and solve their problem(s). The mediators, who are often peers, facilitate communication between the parties and empower the students to generate options for resolution and ultimately assist the development of their own resolution to the dispute. The Mediation Program is a larger component of the effort.
to provide students with the opportunity to develop important life skills such as conflict resolution, anger management, and effective communication skills. For more information call (603) 862-3377.

**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; increasing networking among women; and informing the community of issues relating to the status of women. The commission reports annually to the president on its activities and findings. Commission membership consists of a chairperson and volunteer representatives from University students, faculty, and staff. Candidates for membership are recommended by the commission and appointed by the UNH president. Located in Thompson Hall, 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 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. Established in 1997, 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 identifies, recommends, and supports creative strategies for promoting and supporting campus diversity; it responds to issues, needs, and concerns identified within the community; it works to establish effective and collaborative working relationships among 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. A central resource for people of color on campus is the Office of Multicultural Student Affairs (OMSA). Contact OMSA at (603) 862-2050 or on the Web at www.unh.edu/omsa. The commission is located in Thompson Hall. Call (603) 862-1058 or visit the commission’s Web page at www.unh.edu/cspc for more information.

**President’s Commission on the Status of Gay, Lesbian, Bisexual, and Transgender Issues**

The mission of the UNH President’s Commission on the Status of Gay, Lesbian, Bisexual and Transgender Issues is to facilitate the development of a university community that is equitable and inclusive of all sexual orientations and gender identity and expressions. The commission assists the president in monitoring the campus climate for gay, lesbian, bisexual, and transgender faculty, staff, and students; reviews policies and programs; and makes recommendations for improving the campus climate.

Established in 1992, the commission meets monthly during the academic year. Its membership includes gay, lesbian, bisexual, transgender, and allied University faculty, staff, and students who are appointed by the president. Students from the gay, lesbian, bisexual, transgender, and allied community who are interested in participating on the commission are encouraged to contact the chair. Call (603) 862-1058, or visit the commission’s Web page at www.unh.edu/glbt.

**Police, University**

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 police and Security Services units.

Police department staff members participate in a number of programs for the UNH community including adopt-a-dorm and a women’s self-defense program. The department also provides literature regarding crime prevention. 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, (603) 862-1427.

**Residential Life**

Residential Life staff members focus on integrating students’ learning outside the classroom with traditional learning in the classroom. Staff members work with students, helping them to succeed academically, become positively involved in the hall and University community, and make friends. They accomplish this by providing students with social and educational opportunities, along with daily interaction.

The Residential Life staff includes a director, a team of 30 professional staff members, and 150 resident assistants (RAs) who are a carefully selected group of undergraduate and graduate students. Each residence hall is staffed with at least one full-time professional and several resident assistants.

The director of residential life also serves as assistant vice president for student and academic services. In addition, Residential Life staff members often initiate responses to individual student emergencies. The assistant vice president also assumes co-responsibility for leadership development, establishing joint ventures with academic programs, orienting new students to the University, and educational and social programming.

Students are welcome to stop by the Residential Life Office, located in 13A Hitchcock Hall, or call for more information at (603) 862-2268.

**Sexual Harassment and Rape Prevention Program (SHARPP)**

SHARPP is a University of New Hampshire-based crisis intervention center dedicated to providing free and confidential services to survivors of sexual assault, sexual harassment, childhood sexual abuse, incest, intimate partner violence, and stalking, and their allies. In addition, SHARPP’s Outreach Program provides education and awareness programs on sexual and interpersonal violence to the greater University of New Hampshire community. SHARPP’s services are largely supported by volunteers; volunteering for SHARPP provides many opportunities for the development of leadership skills.

SHARPP’s Direct Services include a 24-hour crisis line, emergency medical accompaniment, criminal justice and University judicial process advocacy, support in obtaining academic assistance, support groups,
also provides crisis services and support for those who are close to the survivor, including roommates, parents, friends, family members, and instructors.

SHARPP's Outreach program provides the highest quality awareness and educational programming, including campus-wide peer education programs for students in the residential halls, classrooms, and Greek houses, and orientation activities and training for athletic teams, student organizations, and faculty and staff. SHARPP also sponsors awareness events and activities throughout the year.

The SHARPP office is located at 6 Garrison Ave., Verrette House. The office is open Monday through Friday, 8:00 a.m.-4:30 p.m. The Web site is www.unh.edu/sharpp/. The crisis line and administrative number is (603) 862-3494. SHARPP is also available through a toll free number at 1-888-271-7233 and by TTY at 1-800-735-2964. After hours, all calls will be returned by a trained advocate within 10 minutes. All calls are free and confidential.

Student and Academic Services

The University of New Hampshire has made a commitment to "provide students an innovative, high quality, coherent, and integrated educational experience." This commitment outlined in the Academic Plan obligates us to create a learning environment that offers students the greatest opportunity to grow and that provides sufficient connection to the "outside world" for the opportunity to test the relevance and the effectiveness of what they are learning. Such an approach to higher education also requires that we provide the support and direction necessary for the success of our students' endeavors.

The Division of Student and Academic Services seeks to forge integral links between the academic and non-academic aspects of student life, to create better connections between curriculum and co-curricular experiences, and to foster high expectations for academic and personal excellence for all students. The focus of this division is on assisting students to be successful at UNH, contributing to a process of intellectual, personal, and social development that produces graduates who are well-educated, well-adjusted, and prepared to realize their goals and contribute to their communities and society with intellect, professional competence, social awareness, the capacity for effective civic engagement, and respect and understanding for the diversity of people and the world around them.

The Office of the Vice President for Student and Academic Services provides students with information, assistance in problem resolution, and referrals. For more information or assistance, call the office at (603) 862-2053.

University Advising and Career Center

The University Advising and Career Center, Hood House, (603) 862-2064, provides academic advising to undeclared students in the College of Liberal Arts, provisional English and provisional psychology majors. It supports all students and alumni in career exploration. The center's professional staff provides assistance to students in clarifying their interests and skills as they relate to developing a program of study at the University and declaring a major, offering opportunities to explore career possibilities, and aiding in securing employment. Vocational assessments (Myers-Briggs type indicator and Jackson Vocational Interest Survey) are offered to help individuals to identify potential majors and careers. A career library, a nationwide parent/alumni career mentor network comprised of more than 500 members, and an internship office help students explore career possibilities. Job opportunities are offered through online recruiting. Specific job notices are also offered on the center's Web site. Additionally, the center sponsors a variety of fairs and activities that bring students into contact with prospective employers and internship opportunities, and help to prepare students for careers.

The center is also the campus resource for students seeking admission to medical and related health profession schools and law school. More broadly, the center assists students considering graduate education, sponsors a graduate and professional school fair, administers national tests for post-baccalaureate study, and guides individuals to resources across the University. The center's Web page is at www.unh.edu/uacc/.

University Internships

Supported by the federally funded Job Locator Development Program, the internship office in University Advising and Career Center helps students locate preprofessional internships in settings ranging from traditional business and research facilities to more uniquely tailored environments that reflect academic and career interests. Students who wish to engage in career-oriented work experiences should consult with an appropriate faculty sponsor regarding the possibility of receiving academic credit.

Students who wish to secure internships should consult the internship postings listed on the UNH Monster Trak link on the center's Web site. Postings are also listed in the center. Several academic departments also have internship listings posted.

For more information regarding internships, consult the center's Web site at www.unh.edu/uacc or contact the center at (603) 862-2064.

Veterans Information

The UNH veterans' coordinator, located in the Registrar's Office at (603) 862-1595, provides counseling on all aspects of veterans' benefits and 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, day care, career planning, employment, financial aid, tutoring assistance, remedial training, handicapped services, and Vietnam Veterans Outreach. The coordinator also provides a framework for networking among campus veterans. For further information, send e-mail to Lonn.Sattler@unh.edu.

University Writing Program

The University Writing Program is dedicated to making all UNH students successful writers. The University Writing Committee and program staff research, organize, develop, and support a wide range of activities that help students and faculty. The writing program conducts routine and directed assessments of the University writing requirement and the writing intensive (WI) courses that all undergraduates must take. The Writing Committee reviews applications for WI course status as well as student petitions and waivers that allow non-standard and transfer courses to count as writing intensive. UNH has a highly successful writing fellows program that allows specially prepared students to work with writers in specific writing intensive courses. Frequent seminars, workshops, and classes offer both faculty and students the opportunity to learn more about writing, teaching with writing, and emerging technologies for writing.

Robert J. Connors Writing Center

The Robert J. Connors Writing Center provides individual writing conferences to members of the University community. Collaborating on writing helps students excel in classes and beyond. Writers of all skill levels are encouraged to visit the center to have conversations about their writing. Peer
The Connors Writing Center stresses a focus on higher level concerns such as organization, development of ideas, and clarity, but writing assistants are also equipped to discuss sentence-level concerns such as grammar and punctuation. The center welcomes all students, including those whose first language is not English. Writing assistants are trained to work with ESL and EFL students of all levels.

The center offers one-on-one conferences by appointment or by walk-in. Conferences are free and usually last about 50 minutes. The writer’s goals set the course for the conference, and students decide whether tutors communicate the results of the conference to their instructors.

Students may call (603) 862-3272 for an appointment or visit the Writing Center in Hamilton Smith, room 7. The Writing Center also offers a walk-in satellite location at Dimond Library. Visit the Writing Program’s Web site at www.unh.edu/writing.

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**Health Services**

The University has a state-licensed and nationally-accredited (aaahc.org) health and wellness program.

**Health and Counseling Fee**

All undergraduate and graduate degree candidates and all full-time non-degree candidates pay a mandatory health and counseling fee. For the academic year 2006-2007, the health and counseling fee was $535. The health fee covers many outpatient care needs that are available at Health Services. However, charges not covered by the health fee are the responsibility of the student. Students should check with the Health Services business office at (603) 862-2840 with any questions.

**Health Insurance**

The University is undergoing changes at this time with regard to health insurance for undergraduate students. Please contact the Director of Finance and Administration at Health Services at (603) 862-2853 or check the Web site at www.unh.edu/health-services for current information about health insurance.

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**Health Record Requirement**

In order to provide effective care, Health Services requires that undergraduate students who have been formally accepted for a bachelor's or associate's degree candidacy, and who register for five or more credits, must have health information on file with Health Services. This information will include three forms provided by Health Services on its Web site at www.unh.edu/health-services. These include a physical assessment and immunization form, to be completed by a medical provider and mailed to Health Services, and a health history form, to be completed by the student on-line.

Proof of immunity to MMR is mandatory (UNH Academic Policy 02.14). Students must meet one of the following criteria for proof of immunity: have received two vaccinations at least one month apart after 12 months of age, have positive titers (blood test), have health provider documentation of past history of the diseases, or have been born before 1957. Students requesting a religious exemption from measles vaccinations must complete the UNH Health Services Request for Exemption, form 202.5. Students from countries where TB is endemic are required to either provide documentation of being tested within six months prior to enrollment or provide documentation of treatment for either latent or active TB or a negative chest radiograph if the test is positive. It is the responsibility of students to complete the forms before the beginning of classes. Any student failing to complete these requirements may not be cleared to register for future classes.

**Medical Services**

Health Services provides comprehensive, student-focused, primary medical care, laboratory testing, radiology, and pharmacy services. During the regular academic year, the clinical staff consists of board-certified physicians, nurse practitioners, nurses, and medical assistants who have experience working with adolescents and young adults and are committed to prevention and holistic care. They work in teams, three of which focus on general medicine services, commonly seeing, for example, infectious diseases, injuries, and mental health concerns. The fourth team focuses on women's health and provides annual exams, PAP tests, and numerous other services for women. There is also a travel clinic providing clearance and immunizations for foreign travel and an allergy clinic providing allergy shots. One may speak by telephone with a triage nurse for advice at any time. Limited services are available for faculty and staff.

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**Medical/Psychological Withdrawals**

All students seeking assistance with medical withdrawals or those who will be out of school for extended periods of time due to medical emergencies should be in touch with Health Services at 862-1098. Information is also available on the Web at www.unh.edu/health-services/withdrawal.html.

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**Office of Health Education and Promotion**

The Office of Health Education and Promotion (Room 249, Health Services Center) presents educational workshops and facilitates ongoing educational groups on a variety of physical and emotional health issues. Confidential assessment and referral are also available. The office offers alcohol and other drug counseling, nutrition counseling, stress management counseling, tobacco cessation services, and confidential HIV counseling and testing. A health educator/nurse provides education and support to students living with chronic illnesses. Massage therapy is also available. The resource library (Room 218) contains information on physical and emotional health issues, including HIV/AIDS, alcohol, tobacco, and other drugs, men's and women's health issues, wellness, stress management, sexuality, nutrition, and eating concerns. These services and programs reflect Health Services's commitment to assisting students in achieving optimal health and well-being. Appointments are made at the Office of Health Education and Promotion, or by calling (603) 862-3823.

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The staff maintains close relationships with outside specialists in the Seacoast area to whom they may refer patients. Well-staffed and well-equipped community hospitals are nearby and an emergency ambulance service is available in Durham at all times. For after-hours urgent care, Health Services has an agreement with one of the local hospitals to provide care for students.

General medical appointments may be made by calling (603) 862-2856, and women's health appointments by calling (603) 862-1806.
The cost for 2006-2007 at the University averages about $21,000 for residents of New Hampshire and about $33,500 for nonresidents. See the following chart for a breakdown of these costs.

UNH bills are sent electronically only. Bills are posted to student MyUNH (blackboard.unh.edu) accounts. Students are notified through UNH assigned e-mail addresses when new bills are posted.

### Fees and Expenses

#### Fees and Expenses (2006-2007)**

<table>
<thead>
<tr>
<th></th>
<th>In-state residents</th>
<th>Non-residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition Fees</td>
<td>$8,240</td>
<td>$20,690</td>
</tr>
<tr>
<td>Activity fee</td>
<td>92</td>
<td>92</td>
</tr>
<tr>
<td>Recreational fee</td>
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<td>Memorial Union fee</td>
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<tr>
<td>Student athletic fee</td>
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<tr>
<td>Health and counseling fee</td>
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<tr>
<td>Technology fee</td>
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<td>108</td>
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<tr>
<td>Transportation fee</td>
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</tbody>
</table>

#### Subtotal of Required Expenses

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<tr>
<th></th>
<th>In-state residents</th>
<th>Non-residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room and Board</td>
<td>$10,401</td>
<td>$22,851</td>
</tr>
<tr>
<td>Double room</td>
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<tr>
<td>Silver Meal Plan</td>
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</table>

#### Total Estimated Expenses

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<tr>
<th></th>
<th>In-state residents</th>
<th>Non-residents</th>
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</thead>
<tbody>
<tr>
<td>Estimated Expenses</td>
<td>$7,584</td>
<td>$17,851</td>
</tr>
<tr>
<td>(to cover books, supplies, transportation, misc.)</td>
<td>3,000</td>
<td>3,000</td>
</tr>
</tbody>
</table>

#### Approximate Costs

<table>
<thead>
<tr>
<th></th>
<th>In-state residents</th>
<th>Non-residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional Fee</td>
<td>$21,000</td>
<td>$33,500</td>
</tr>
</tbody>
</table>

#### Tuition*

Tuition for the academic year 2006-2007 was $8,240 for N.H. residents and $20,690 for nonresidents. The rates per credit hour in 2006-2007 were $343 for N.H. residents and $862 for nonresidents.

Students are permitted to enroll for more than 20 credits only with the approval of their college or school dean. Persons carrying more than 20 credits will be billed a per-credit fee for each credit above 20 credits, whether or not a student has obtained the dean's approval.

(See per-credit hour rates above.) No refund will be made if a student subsequently drops a course, bringing the credits to 20 or fewer. Undergraduates registering for fewer than 12 credits pay the per-credit hour charge, plus a registration fee of $20 per semester. The minimum charge for any recorded course is the per-credit charge of 1 credit hour.

### Fees*

Required fees for 2006-2007 included a Memorial Union fee ($300) for the use and administration of the student union; a recreational fee ($350) for support of recreational facilities; a student activity fee ($92) for support of the undergraduate newspaper, yearbook, student government, student lawyer, student radio station, and other student organizations; a technology fee ($108); a student athletic fee ($726) to provide support for athletic programs; a health and counseling fee ($535) to provide general health care through University Health Services; and a Transportation fee ($50) to provide student transportation services.

There are no waivers of these fees. The services and facilities are available to all the extent to which each student uses them, and the assessment is determined. Students who withdraw or drop to part-time after classes begin are eligible for refund of fees at the same rate as tuition refunds listed previously.

As a condition of enrollment, all international students are required to purchase the International Sickness and Injury Plan sponsored by UNH. There are no exceptions to this policy.

A $45 contribution may be included to sponsor the UNH Parents Association.

### Mandatory Fees Include

#### Recreation Fee

Use of indoor pool at the field house
Use of athletic facilities at the Whittemore Center, which includes:
- Aerobics
- Saunas
- Locker rooms

With an additional fee:  
- CPR/First Aid course
- Ballroom dancing
- Lifeguard instruction

#### Health Services Fee

For information on health services, see page 13.

#### Memorial Union Fee

For more information on the Memorial Union Building, see page 7.

#### Athletic Fee

Admittance to all home games of organized sports at UNH

Financial support for athletes and athletic teams
Activity Fee
Support for the following organizations:
The undergraduate newspaper
Yearbook
Student government
Student lawyer
Student radio station
Movies at reduced rates
For more information, check the Get Involved guide available at the Memorial Union Building.

Technology Fee
Support for the following:
Student computing clusters
Walk-in Help Desk services
Technology-enhanced classrooms
infrastructure
Academic technology liaisons
Technology-enhanced learning

Transportation Fee
Student transportation Services:
Campus Connector
Wildcat Transit
Safe rides
Amtrak Quik Ticket trip
Non-emergency rides

Room and Board*
Room and board charges averaged $7,584 for the 2006-2007 academic year for a double room with a mandatory meal plan.

New students accepting a space on campus must include a $200 housing deposit with a signed application; for returning students, the deposit is $500. Written notification of cancellation of the room application or assignment received before August 15 will result in forfeiture of the deposit only. Written notification of cancellation after August 15 and before Friday of the first week of class will result in a charge of one-fourth of the full semester's housing fee.

If the student fails to occupy the assigned room by Friday of the first week of class or cancels the agreement by mutual consent, or if for disciplinary or nonrenewal actions the agreement is canceled, the student will receive a 75 percent refund of the semester's housing fee. Cancellation after the first Friday of classes and before thirty days after registration will result in a 50 percent refund of the semester's housing fee. Cancellation thirty days after registration will result in no refund of the housing fee. Students who check in or move in to a hall or apartment, move out, and do not withdraw from the University are charged the full housing fee. If the agreement is canceled, the total amount of the housing deposit will be applied against any unpaid University charges.

Refunds of meal plans will be granted only on approval waivers or upon withdrawal from the University. If a refund is approved for an Unlimited Meal Plan, the balance will be prorated by the number of weeks the student attended classes. Block Meal Plans will be prorated by the number of meals consumed. Unused Dining Dollars will be refunded minus any applicable bonus. If a student has spent any part of the bonus, that amount will be charged to the student account.

Rebates
Any amount owed to the University will be deducted from any rebate due to a student.

Deposits and Course Fees
Refundable deposits may be required to cover locker keys or loss or breakage in certain departments. A charge will be made for individual lessons in music, as noted in the description of applied music courses. A charge will be made for riding lessons and scuba, as noted in the sections on animal sciences and physical education. Some courses carry special fees to cover the costs of special equipment, field trips, etc.; these are noted in the course descriptions. Thompson School students pay curriculum fees to cover special costs in their programs (see the Thompson School section). Students will be charged a computer use fee for courses requiring computer access and/or common access accounts. For certain courses, there are also lab fees.

Other Expenses
Books and classroom supplies cost approximately $800 annually. These may be purchased at the University Bookstore.

Personal expenses vary considerably with individual students and include clothing, laundry, recreation, incidentals, and travel.

Payment
All bills for tuition, fees, room and board and other semester charges are due in full on the payment due date for each semester. A late fee may be assessed to student accounts not paid in full by that payment due date. Student accounts not paid in full within 30 days after the payment due date may be assessed additional late fees, default charges, interest and/or collection costs, and the student may be subject to deregistration from classes.
UNIVERSITY ACADEMIC REQUIREMENTS

To graduate from the University of New Hampshire, baccalaureate and associate in arts students must fulfill four types of University requirements: writing, general education, degree, and major. For associate in applied science degree requirements, see page 122.

University Writing Requirement

As the cornerstone of any higher education, academic and disciplinary literacy is the concern of the entire faculty and the whole University curriculum. Understanding that literacy is a long-term development process, the University community is committed to the following goals for student writing and learning:

- Students should use writing as an intellectual process to learn material, to discover, construct, and order meaning.
- Students should learn to write effectively in various academic and disciplinary genres for professional and lay audiences.
- Students should learn to display competence with the generic features and conventions of academic language.

Writing Intensive Courses

All bachelor's degree candidates are required to complete four “writing intensive” courses, which must include English 401 (Freshman Composition) and three additional “writing intensive” courses, one of which must be in the student’s major, and one of which must be at the 600-level or above. Specific courses that fulfill the writing requirement are listed at unhinfo.unh.edu/registrar/registration.html. Some courses have both writing intensive and non-writing intensive versions, such as HIST 405 and HIST 405W. In those cases, only the sections attached to the “W” courses will be writing intensive.

Please note that some cross-listed courses are also writing intensive. For the most current information on cross-listed courses, visit the Web site listed above.

General Education Program

The general education program is designed to emphasize the acquisition and improvement of those fundamental skills essential to advanced college work, especially the abilities to think critically, to read with discernment, to write effectively, and to understand quantitative data. It aims to acquaint the student with some of the major modes of thought necessary to understanding oneself, others, and the environment. It seeks to develop a critical appreciation of both the value and the limitations of significant methods of inquiry and analysis. Its goal, moreover, is the student’s achievement of at least the minimal level of literacy in mathematics, in science and technology, in historical perspectives and the comprehension of our own and other cultures, in aesthetic sensibility, and in the diverse approaches of the humanities and the social sciences to understanding the human condition.

General education is intended to serve as a foundation for any major. It aims to go beyond the mastery of job-related skills and educate students so that they learn how to learn. The program is based on the premise that change is the dominant characteristic of our times and that the truly useful education stresses intellectual adaptability and the development of those problem-solving abilities, cognitive skills, and learning techniques vital to lifelong learning.

General Education Requirements

Students must fulfill the following general education requirements:

1. one course in writing skills, which must be taken during a student’s first year. This course will satisfy the English 401, First Year Writing component of the writing requirement;
2. one course in quantitative reasoning, which must be taken during a student’s first year;
3. three courses in biological science, physical science, or technology, with no more than two courses in any one area;
4. one course in historical perspectives;
5. one course in foreign culture (may also be satisfied by approved study abroad programs);
6. one course in fine arts;
7. one course in social science; and
8. one course in works of philosophy, literature, and ideas.

General education requirements shall not be waived on the basis of special examinations or placement tests, except for the College Board Advanced Placement tests and the College Level Examination Program (CLEP) tests. The required courses cannot be taken on a pass/fail basis. No single course may be counted in more than one general education category. Academic departments may or may not permit general education courses to count toward requirements for a major. Each course must carry at least 3 credits to qualify for general education consideration.

The specific courses that fulfill each category of the general education requirements are printed below. Any course appearing in this list will fulfill a general education requirement if taken after September 1, 2007. For the most current listing of general education courses, go to: unhinfo.unh.edu/registrar/geneduc/genedreq.html.

1. Writing skills
ENGL 401

2. Quantitative reasoning
ADM 430
ADMN 420
BIOC 528
CIS 425
CS 405, 407, 410
EREC 525
HHS 540
MATH 420, 424, 425, 439
PHIL 412
PSYC 402
SOC 502

3. Biological science, physical science, and technology

Biological science
ANSC 401
BIOC 411, 412, 413, 414, 416
BSCI 405, 406, 431
HMP 501
KIN 527, 607
MICR 407, 501
MLS 444A
NR 410, 433
NUTR 400
OT 513
PBIO 400, 412, 421
ZOOL 401, 412, 444A, 474, 507, 508
4. Historical perspectives
ANSC 415, 444
CHEM 444
ENGL 515
FS 444
GEOG 586
HIST 405, 406, 410, 421, 422, 435, 436, 444, 444A, 444B, 444C, 444D
483, 497, 505, 506, 511, 512, 521, 522, 531, 532, 565, 567, 579
HMP 505
HUMA 510C, 511C, 512C, 513C, 514C, 515C
ITAL 681A, 682A
KIN 444B, 561
POLT 403, 508
RS 483

5. Foreign culture
ANTH 411, 500, 512, 515, 650
CHIN 425, 503, 504
ENGL 581
FREN 425, 426, 503, 504, 525, 526
GEOG 401, 402, 541
GERM 503, 504, 523, 524, 525
GREK 503, 504, 505, 506
HIST 425, 563
INTR 438
ITAL 425, 503, 504, 525
JPN 425, 503, 504
LATN 503, 504
LLC 444A, 444B
NR 660
POLT 553, 555, 556
RUS 425, 503, 504
SPAN 503, 504, 525, 526

6. Fine arts
AMST 444C
ARTS 444A, 480, 487, 532, 570, 571, 572, 573, 574, 580, 581
CA 502
FREN 522
HUMA 510A, 511A, 512A, 513A, 514A
INCO 480
LLC 444D
MUSI 401, 402, 444, 501, 502, 511
PHIL 421
SOC 580
THDA 435, 436, 438, 450, 459, 461, 462, 463, 487, 546, 548, 583

7. Social science
ADMIN 444
ANSC 405, 444A
ANTH 412, 625
CD 415
CLAS 506
CMN 455, 457
ECN 414, 412
ECON 401, 402
EDUC 444, 444A
ENGL 405, 444B, 444F
ERE 409, 411
FS 525, 545
GEOG 581, 582
GERO 600
HHS 444, 510
HMP 401
HUMA 510D, 511D, 512D, 513D, 514D, 515D
INCO 401, 402
KIN 444A, 560
LING 405, 444B, 444F
NURS 535
NUTR 405
POLT 402, 444, 450, 505, 560, 564, 565, 566, 567
PSYC 401, 444, 444A
RMP 444, 490, 550, 570
SOC 400, 444, 500, 520, 530, 540
SW 444, 525, 550
WS 401, 444

8. Works of literature, philosophy, and ideas
AMST 444A, 444B, 501, 502
ANTH 450
BIOL 444
CLAS 401, 402, 421, 422, 444, 500
CMN 456
ECN 444
ECS 400
FREN 500, 651, 652
GERM 500, 520, 521
HIST 484
INCO 450
ITAL 500, 521, 522, 651, 652, 681B, 682B
LLC 444, 444C
PHIL 401, 417, 424, 430, 435, 436, 444, 444A, 520, 525, 540, 560, 570, 660
POLT 401, 407, 444A, 520, 521, 522, 523, 524
PORT 500
PSYC 571
RMP 511
RS 484
RUSS 426, 500, 521, 522, 593
SPAN 500, 522, 650, 651, 652, 653, 654

*Available only to honors program students and others who have obtained special permission.
**Students may take either HUMA 480A or 480B but not both.
***Students may not receive credit for both ITAL 681A and 681B or 682A and 682B.
†For students who complete the entire sequence of HUMA 510, 511, 512, and 513, enrolling in different discussion sections each time, a fifth general education requirement (in foreign culture) will be waived, although additional credit hours will not be granted.
‡Offered only at UNH Manchester.
Degree Requirements

Requirements in this catalog apply to students who enter the University between July 1, 2007 and June 30, 2008. (Students who entered the University at an earlier time but who wish to change to the requirements of this catalog must apply to the appropriate office for the change.) Students will be held responsible for all work required for graduation and for the scheduling of all necessary courses. Students are each provided one free copy of the catalog that is in effect at the time of their entry to the University. They are expected to keep that copy for the duration of their time at the University. Any other copies must be purchased, and availability cannot be guaranteed.

Modifications tend to occur in major programs during the period of students' undergraduate careers. Students are expected to conform to these changes insofar as they do not represent substantive alterations in their course of study.

Note: Although the University will try to provide sufficient facilities so that students may pursue any major or curriculum for which they meet the requirements, such a privilege cannot be guaranteed, since rapidly increasing enrollment sometimes results in the overcrowding of required specialized courses. On occasion, students may remain in a crowded curriculum if they are willing to take certain courses during the summer session.

Bachelor of Arts

1. At least 128 credits in courses numbered 200-799, with a cumulative grade-point average of 2.00 for all courses taken at the University in which a grade is given.
2. Completion of the University general education requirements.
3. Completion of the University writing requirement.
4. Proficiency in a foreign language at the level achieved by satisfactory work in a one-year, college-level course. This requirement may be fulfilled by taking a College Board foreign language achievement test or by completing the equivalent of a full-year elementary course in any foreign language (must be 8 UNH credits or equivalent), or by completing the equivalent of a semester of a course in a foreign language beyond the elementary year (must be 4 UNH credits or equivalent), or by completing the equivalent of a one-year college-level course in American Sign Language (must be 8 UNH credits or equivalent). Students should be aware that not all majors accept American Sign Language as a means to satisfy departmental foreign language proficiency requirements and should check with their advisers. The proficiency in a foreign language requirement must be satisfied by the end of the sophomore year. No credit is awarded for elementary year college coursework if the student has had two or more years of that language in high school.

Note: A student with a documented disability who wishes accommodation on the basis that the disability will prevent him or her from successfully mastering a foreign language requirement, or whose foreign language requirement was waived in high school because of a documented disability, must contact the Disability Services for Students Office, 118 Memorial Union Building, (603) 862-2607 (Voice/TDD).

Bachelor of Fine Arts, Bachelor of Music

Requirements for the B.F.A. degree are on page 31; for the B.M. degree, on page 44.

Bachelor of Science

1. At least 128 credits in courses numbered 200-799, with a cumulative grade-point average of 2.00 for all courses taken at the University in which a grade is given.
2. Completion of the University general education requirements.
3. Completion of the University writing requirement.
4. For specific requirements, check individual departmental or program listings. See also pages 53, 72, 83, 102, and 131.

Associate in Arts

For degree requirements, see page 131.

Associate in Applied Science

For degree requirements, see page 122.

Dual Degrees

The opportunity to pursue simultaneously two undergraduate degrees enhances and broadens the education of certain students. The program is only for those students who can adequately handle the requirements for two different degrees and who can reasonably allocate the additional time and effort needed for the program. Except for specific five-year degree programs (page 22), a student may not pursue two different degree levels simultaneously.

Requirements

1. Students desiring dual degrees must petition the college dean or deans involved for permission.
2. Students must have a minimum 2.50 cumulative grade-point average.
3. Students planning to take one degree in a highly prescribed curriculum should register as freshmen in the appropriate school or college for that curriculum.
4. It is expected that candidates for two degrees will complete 32 credits beyond those required for the first degree.
5. Students can earn more than one bachelor of science (B.S.) degree, provided that each degree is in a different field. Students cannot earn more than one bachelor of arts (B.A.) degree.
6. Transfer students already holding a baccalaureate degree from another accredited institution may pursue an additional baccalaureate degree at the University of New Hampshire provided they fulfill the previously listed requirements. The degree received at the first institution will be accepted by UNH as awarded by that institution.

Supervision

As soon as a student is accepted as a candidate for two degrees, the appropriate dean(s) will appoint supervisors for each of the proposed majors. The supervisors and the student will work out a basic course plan for the two degrees and inform the appropriate dual degree dean(s) of the plan. The supervisors will maintain joint control over the student's academic program. The college offices and the supervisors will receive copies of grade reports and other records for students pursuing two degrees.

Minimum Graduation Average

A cumulative grade-point average of 2.00 in University of New Hampshire courses is the minimum acceptable level for undergraduate work in the University and for graduation. In addition, some majors require a grade-point average greater than 2.00 in certain courses or combinations of courses. The Academic Standards and Advising Committee examines the records of students periodically and may place academically deficient or potentially deficient students on warning, or may exclude, suspend, or dismiss those who are academically deficient.
Quota of Semester Credits

Students registering for more than 20 credits must receive the approval of the college dean.

Baccalaureate and Associate in Arts undergraduates are assigned class standing on the basis of semester credits of academic work completed with a passing grade, as follows: to be a sophomore—26 credits; to be a junior—58 credits; to be a senior—90 credits.

Residence

"Residence" means being enrolled in University of New Hampshire (including UNH Manchester) courses after admission to and matriculation in a degree program. Students who are candidates for a bachelor's degree must attain the last one-quarter of total credits for the degree in residence unless granted permission by the Academic Standards and Advising Committee to transfer part of this work from other accredited institutions.

Leave of Absence or Withdrawal from the University

Students who leave the University are required to file formal notification with the registrar.

Majors, Minors, and Options

Majors and some interdisciplinary minors are described under their various schools and colleges; other interdisciplinary and intercollege minors are described in Special University Programs, page 109.

Student-Designed Majors

See Special University Programs, page 114, for requirements for a student-designed major.

Second Majors

Bachelor's degree students may choose to fulfill the requirements of two dissimilar major programs, provided they obtain the approval of their principal adviser and the dean(s) of the college(s) in which the programs are offered, and comply as follows:

1. If the two majors are offered in different schools or colleges within the University, the admissions requirements of each must be satisfied.

2. If the two majors have two distinct degrees, e.g., B.A., B.S., or some other designated degree, students must choose which of the two degrees is to be awarded and fulfill all requirements for that degree.

3. No more than 8 credits used to satisfy requirements for one major may be used as requirements for the other major.

Minors

Bachelor's degree students may earn a minor in any undergraduate discipline designated by the University. A list of minors is available from the advising coordinator in each college or school (or see the program descriptions for each college or school in this catalog). Students must consult with their major adviser and also the minor supervisor. A minor typically consists of 20 credits with C- or better and a 2.00 grade-point average in courses that the minor department approves. Courses taken on the pass/fail basis may not be used for a minor. No more than 8 credits used to satisfy major requirements may be used for the minor. Students should declare an intent to earn a minor as early as possible and no later than the end of the junior year. During the final term, an application should be made to the dean to have the minor shown on the academic record.

Options

Some degree programs offer a selection of options (e.g., art history and art studio through the Department of Art and Art History). These concentrations allow students to specialize within a discipline. The choice of option is recorded on the student's transcript.

Grades

Grading and honors policies as stated in this catalog apply to all undergraduate students.

Instructors assign grades as listed below; grade points per credit are indicated in parentheses. For all undergraduate courses, grading standards established by the Academic Senate are that a C indicates competent, acceptable performance and learning; B indicates superior performance and learning; and A indicates excellent performance and learning. These standards apply to all undergraduate courses, instructors, departments, subjects, and colleges. The University reserves the right to modify grading and honors practices.

Students earning a semester or cumulative grade-point average less than 2.00 are placed on "academic warning."
Pass/Fail
While earning a bachelor's degree, students may choose the pass/fail grading alternative for a maximum of 4 credits per semester up to a total of 16 credits toward the degree.

Pass/fail cannot be used for general education requirements, for writing intensive courses, for courses required by a student's major or second major, for option or minor requirements, for ENGL 401, or for repeated courses. In addition, B.A., B.F.A., and B.M. degree candidates may not use pass/fail for courses taken to meet the foreign language requirement, and no Whittemore School course may be taken on a pass/fail basis by a student majoring in administration, economics, or hospitality management.

The minimum passing grade for credit is a D- (0.67); any grade below this minimum is a fail. All grades will be recorded on the grade roster as A, B, C, D, F, or intermediate grades. The pass/fail marks will be placed on students' transcripts and grade reports by the Registrar's Office. The course will not be included in the grade-point calculation, but the pass or fail will be recorded, and in the case of a pass, the course credits will be counted toward degree requirements. Associate in Arts students, see page 131.

Honors
An undergraduate degree student, after completion of at least 12 graded credits in University of New Hampshire courses, is designated as an honor student for a given semester if the student has a) completed at least 12 graded credits for that semester and earned at least a 3.20 semester grade-point average; or b) earned at least a 3.20 cumulative grade-point average and at least a 3.20 semester grade-point average regardless of the number of graded credits that semester.

These categories are used: 3.20 to 3.49 (honors); 3.50 to 3.69 (high honors); and 3.70 to 4.00 (highest honors).

Bachelor's degree candidates who have earned honors for their entire work at the University will be graduated with honors based on the final cumulative grade-point average, provided that a minimum of 64 graded credits have been completed in University of New Hampshire courses. The Latin equivalent of the honors classification will appear on the student's academic record and diploma. The student's honors classification will be noted in the commencement program.

Academic Honesty
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.
**Degrees and Major Programs of Study**

**College of Liberal Arts**
The teacher education division of the College of Liberal Arts coordinates the five-year undergraduate/graduate teacher education program. See page 32.

- Bachelor of Arts
- Anthropology
- The Arts
- Art History
- Art Studio
- Classics
- Communication
- Media Practices
- English
- English/Journalism
- English Literature
- English Teaching
- European Cultural Studies
- French
- French Studies
- Geography
- German
- Greek
- History
- Humanities
- International Affairs (dual major)
- Justice Studies (dual major)
- Latin
- Linguistics
- Music
  - Music History
  - Music Theory
  - Performance Study
  - Preteaching
- Philosophy
- Political Science
- Psychology
- Russian
- Sociology
- Spanish
- Theatre
- Women's Studies

**Bachelor of Fine Arts**
- Fine Arts

**Bachelor of Music**
- Music Education
- Performance
- Theory

**College of Engineering and Physical Sciences**

- Bachelor of Arts
- Chemistry
- Chemistry and Physics Teaching
- Earth Science Teaching
- Earth Sciences
  - Oceanography
- Mathematics
- Physics

- Bachelor of Science
  - Chemical Engineering*
  - Bioengineering
  - Energy
  - Environmental Engineering
  - Chemistry*
  - Civil Engineering*
  - Computer Engineering*
  - Computer Science*
  - Bioinformatics
  - Computer Engineering*
  - Electrical Engineering*
  - Environmental Engineering*
    - Industrial Processes
    - Municipal Processes
  - Environmental Sciences*
    - Hydrology
    - Ecosystems
    - Soil and Watershed Management
  - Geology*
  - Mathematics*
  - Mathematics Education*
    - Elementary
    - Middle/Junior High
    - Secondary
  - Mathematics, Interdisciplinary
    - Computer Science
    - Economics
    - Electrical Science
    - Physics
    - Statistics
  - Mechanical Engineering*
  - Physics*
    - Chemical
    - Materials Science

**School of Health and Human Services**

- Bachelor of Science
  - Communication Sciences and Disorders
  - Family Studies
  - Child and Family Studies
  - Health Management and Policy
  - Public Health
  - Kinesiology
    - Athletic Training
    - Exercise Science
  - Outdooor Education
  - Physical Education Pedagogy
  - Sport Studies
  - Nursing
  - Occupational Science
  - Recreation Management and Policy
  - Program Administration
  - Therapeutic Recreation
  - Social Work

**College of Life Sciences and Agriculture**

- Bachelor of Arts
  - Plant Biology
  - Zoology

- Bachelor of Science
  - Animal Sciences
  - Bioscience and Technology
  - Equine Sciences
  - Preveterninary Medicine
  - Biochemistry
  - Biology
    - Ecology, Evolution, and Behavior Biology
    - General Biology
    - Marine and Freshwater Biology
    - Molecular, Cellular, and Developmental Biology
    - Community and Environmental Planning
    - Dairy Management
    - Environmental Conservation Studies
    - Environmental Horticulture
    - Environmental and Resource Economics
    - Environmental Sciences*
      - Hydrology
      - Ecosystems
      - Soil and Watershed Management
    - Medical Laboratory Science
      - Clinical Chemistry
      - Clinical Hematology
      - Clinical Immunohematology
      - Clinical Microbiology
      - Microbiology
      - Nutritional Sciences
      - Plant Biology
      - Tourism Planning and Development
      - Wildlife Ecology
      - Zoology

- Bachelor of Science in Forestry
  - Forestry*
    - Forest Management
    - Forest Science

*Designated degree (the name of the specialization is included on the diploma; e.g., B.S. in Chemistry).
Whittemore School of Business and Economics
Bachelor of Arts
Economics
Financial and Managerial Economics
International and Development Economics
Public Policy Economics

Bachelor of Science
Business Administration
Accounting
Entrepreneurial Venture Creation
Finance
Information Systems Management
International Business and Economics Management
Marketing
Student-Designed Economics
Hospitality Management

Thompson School of Applied Science
Associate in Applied Science
Applied Animal Science
Applied Business Management
Civil Technology
Community Leadership
Food Services Management
Forest Technology
Horticultural Technology

University of New Hampshire at Manchester
Associate in Arts
General Studies

Associate in Applied Science
Community Leadership

Associate in Science
Biological Sciences
Business Administration

Bachelor of Arts
Business
Communication Arts
English
History
Humanities
Politics and Society
Psychology

Bachelor of Science
Computer Information Systems
Electrical Engineering Technology*
Computer Technology
Mechanical Engineering Technology*
Nursing
Sign Language Interpretation

Five-Year Degree Programs
Bachelor of Arts and Master of Education**
Bachelor of Science and Master of Education**
Bachelor of Science and Master of Science in Accounting
Bachelor of Science and Master of Science in Biochemistry
Bachelor of Science and Master of Science in Occupational Therapy

Interdisciplinary Majors
Bachelor of Arts/Bachelor of Science
International Affairs

Bachelor of Science
Environmental Sciences
Hydrology

Interdisciplinary Minors
Adolescent and Youth Development
African American Studies
Agribusiness
Air Force Leadership Studies
American Studies
Animal Behavior
Architectural Studies
Asian Studies
Canadian Studies
Child Life
Cinema Studies
Community Planning
Deaf and Hard of Hearing Studies
Disabilities
Environmental Engineering
Genetics
Gerontology
History and Philosophy of Science
Humanities
Hydrology
Illumination Engineering
Justice Studies
Latin American Studies

Marine Biology
Materials Science
Ocean Engineering
Oceanography
Plant Pest Management
Race, Culture, and Power
Religious Studies
Russian Studies
Sustainable Living
Technology, Society, and Values
War and Peace Studies
Wetland Ecology
Women’s Studies

Advisory Committees
Prelaw
Premedical/Prehealth Care Professional

Graduate School
Master of Arts
Master of Science
Master of Arts in Liberal Studies
Master of Arts in Teaching
Master of Business Administration
Master of Education
Master of Fine Arts
Master of Public Administration
Master of Public Health
Master of Science for Teachers
Master of Social Work
Certificate of Advanced Graduate Study
Doctor of Philosophy

*Designated degree (the name of the specialization is included on the diploma; e.g., B.S. in Chemistry).

**Also Master of Arts in Teaching.
The following abbreviations are used to identify undergraduate and graduate courses offered at the University. An asterisk (*) preceding the letters identifies those disciplines offering graduate-level coursework.

**College of Liberal Arts**
- ANTH Anthropology
- ARTS Art and Art History
- *ARTS Painting*
- CHIN Chinese
- CLAS Classics
- CMN Communication
- *EDUC Education*
- ENGL English
- ECS European Cultural Studies
- FREN French
- GEOG Geography
- GERM German
- GREK Greek
- *HIST History*
- HUMA Humanities
- ITAL Italian
- JPN Japanese
- *JUST Justice Studies*
- LLC Languages, Literatures, and Cultures
- LATN Latin
- LING Linguistics
- *MUSI Music*
- *MUED Music Education*
- *POLT Political Science*
- PHIL Philosophy
- PORT Portuguese
- *PSYC Psychology*
- RS Religious Studies
- RUSS Russian
- SCSC Social Science
- *SOC Sociology*
- *SPAN Spanish*
- THDA Theatre and Dance
- WS Women's Studies

**College of Engineering and Physical Sciences**
- CHE Chemical Engineering
- CHEM Chemistry
- CIE Civil Engineering
- CS Computer Science
- ESCI Earth Sciences
- ECE Electrical and Computer Engineering
- *ENGR Engineering*
- ENE Environmental Engineering
- MATH Mathematics and Statistics
- ME Mechanical Engineering
- MS Materials Science
- OE Ocean Engineering
- PHYS Physics
- TECH Technology (nondepartmental)

**School of Health and Human Services**
- *COMM Communication Sciences and Disorders*
- *FS Family Studies*
- *HHS Health and Human Services*
- *HMP Health Management and Policy*
- *KIN Kinesiology*
- *NURS Nursing*
- *OT Occupational Therapy*
- *PHP Public Health*
- *RMP Recreation Management and Policy*
- *SW Social Work*

**College of Life Sciences and Agriculture**
- *ANSC Animal Sciences*
- *BCHM Biochemistry*
- *BIOL Biology*
- *CD Community Development*
- *EREC Environmental and Resource Economics*
- *GEN Genetics*
- *LSA Life Sciences and Agriculture*
- *MICR Microbiology*
- *MLS Medical Laboratory Science*
- *NR Natural Resources*
- *NUTR Nutritional Sciences*
- *PHIO Plant Biology*
- *RAM Resource Administration and Management*
- *RECO Resource Economics*
- *TOUR Tourism Planning and Development*
- *ZOOL Zoology*

**Whittmore School of Business and Economics**
- *ACFI Accounting and Finance*
- *ADMN Business Administration*
- *DS Decision Sciences*
- *ECON Economics*
- *HMGT Hospitality Management*
- *MGT Management*
- *MKTG Marketing*

**Additional Programs**
- AERO Aerospace Studies
- AMST American Studies
- *ENED Environmental Education*
- *EOS Earth, Oceans, and Space*
- GERF Gerontology
- GRAD Graduate School
- IA International Affairs
- INCO Intercollage
- *LS Liberal Studies*
- MILT Military Science
- *NRES Natural Resources and Earth Systems Sciences*

**Thompson School of Applied Science**
- AAS Applied Animal Science
- ABM Applied Business Management
- AM Agricultural Mechanization
- CT Civil Technology
- COM TSAS Communication
- CSL Community Leadership
- FORT Forest Technology
- FSP Food Services Management
- HT Horticultural Technology
- MTH TSAS Mathematics
- SSCI TSAS Social Science

**University of New Hampshire at Manchester**
- ADM Business Administration
- ASL American Sign Language
- BSCI Biological Science
- CA Communication Arts
- CIS Computer Information Systems
- ECN Economics
- ET Engineering Technology
- INTR Sign Language Interpretation

**Colleges and Schools**
- COLA College of Liberal Arts
- CEPS College of Engineering and Physical Sciences
- SHHS School of Health and Human Services
- COLSA College of Life Sciences and Agriculture
- WSBE Whittemore School of Business and Economics
- TSAS Thompson School of Applied Science
- UNHM University of New Hampshire at Manchester
- GRAD Graduate School
It is the purpose of the College of Liberal Arts, as a center of learning and scholarship, to help students achieve an understanding of the heritage of civilization and to educate them in the tradition of the past and realities of the present so they may recognize and act upon their obligations to the future.

The college seeks to meet the educational needs of each student through the development of interests and skills, which, combined with the individual's potential, make possible a richer, more useful life.

Degrees

The College of Liberal Arts offers three degrees: bachelor of arts, bachelor of fine arts, and bachelor of music.

Bachelor of Arts

These programs primarily provide a broad liberal education along with a major in one of the fields listed on this page. For requirements for the bachelor of arts degree and information regarding these majors, see Degree Requirements and Programs of Study, pages 18 and 30.

Bachelor of Fine Arts

This curriculum provides training for students who plan to enter a professional graduate school. For requirements for the bachelor of fine arts degree, see Art and Art History, page 30.

Bachelor of Music

This curriculum provides professional training in performance, in musical theory, and in music education, and it allows students to develop their talent to a standard equivalent to the one achieved at conservatories of music. For requirements for the bachelor of music degree and information regarding the curriculum, see page 44.

Degrees include Music Education; Organ; Piano; Strings, Woodwinds, Brass, or Percussion Theory; and Voice.

Combined Programs of Study

In addition to pursuing a single major, students may combine programs of study as follows:

Minors: See page 19; see also interdisciplinary minors, page 22, and below.

Second Majors: See page 19.

Dual-Degree Programs: See page 18.

Student-Designed Majors: See page 114.

Other combined programs and interdisciplinary opportunities: See page 110.

Interdisciplinary Programs

African American Studies

www.unh.edu/afamstudies/

The African American studies minor provides students with an interdisciplinary approach to a central dimension of United States history, literature, and culture. Many aspects of African American history and culture have been central to the development of the United States, highlighting both the nation's problems and its promise, and affecting virtually all areas of academic study through the years, from the humanities to the sciences. The minor therefore is designed to serve the needs of all students, regardless of their ethnic or cultural background, complementing their work in their major fields of study while serving also as a focused corrective to traditionally marginalized approaches to African American experience.

African American studies consists of five 4-credit courses, including an introductory course, a required history course, and three other approved offerings. Students must take at least one course at the 600 or 700 level. The required core courses provide students with a general understanding of the broad and diverse spectrum of African American history, literature, and culture. Electives enable students to develop that understanding by way of special topics courses in their major fields of study, including some that provide students with an opportunity to relate African American issues to African American studies. Students must earn a C- or better in each course, and maintain a 2.00 grade-point average in courses taken for the minor. Electives may include a senior seminar.

Students interested in minoring in African American studies should contact the coordinator, Funso Afolayan, Department of History, 415 Horton Social Science Center, (603) 862-3026, e-mail fsa@unh.edu; or African American Studies office, 329 Huddleston Hall, (603) 862-3753; e-mail afam.minor@unh.edu.
American Studies (AMST)

**Required Courses**
- ENGL 517/AMST 502, Introduction to African American Literature and Culture
- INCO 450, Introduction to Race, Culture, and Power
- HIST 505 or 506, African American History

**Elective Courses**

Electives are approved for the minor and announced, each semester, in the Time and Room Schedule and on the American Studies Web site, www.unh.edu/amstudies.

American Studies is the interdisciplinary study of United States culture in all its varied aspects. Students learn to connect history, art, politics, religion, popular culture, literature, and other features of American life and to examine both the differences and the similarities among, for example, different cultural and ethnic groups, historical periods, and media. We are an intercollege minor drawing courses from fifteen departments, courses emphasizing the interrelationship among current methodologies, thought, and scholarship concerning the study of American culture and society. We encourage students to take advantage of the rich resources of the New England region through internships and independent studies at local museums, libraries, historical societies, and other institutions dedicated to the study and preservation of American culture. Students can also participate in exchange programs at universities with other regional or ethnic studies programs. Independent study, field work projects, and exchanges must be approved by the faculty member supervising the work and by the coordinator of the American Studies minor.

The American Studies minor consists of five courses. Students must take American Studies 501 as early as they are ready to do so. In addition, students must take at least one other American Studies course (preferably more), and at least one course concentrating on an issue of race, gender, or ethnicity in America (stated [*] courses). No more than two courses of the five may be at the 500 level (departmental prerequisites may be waived for American Studies students at the discretion of the instructor). Students must earn a C- or better in each course and maintain a 2.00 grade-point average in courses taken for the minor.

Because of the range and breadth of possible American studies concentrations, students are urged to see the coordinator and fill in an intent to minor form as soon as they become interested in the minor, preferably by the beginning of their junior year. Students may wish to focus their coursework in the minor around a coherent topic, either chronologically or thematically. Examples include but are not limited to: a specific historical period (for example, the twentieth century); race, ethnicity, gender, or class in America; popular culture; the arts; Native American studies; regional studies; urban, rural, and natural environments; American institutions (education, sports, religion, etc.). Students might also consider concentrating their major work in courses related to American Studies.

Interested students should contact the American Studies office, 329 Huddleston, (603) 862-3753; e-mail amst.minor@unh.edu.

**Courses**

- **AMST 444A**, Portable, Exportable Nation
- **AMST 501**, Introduction to American Studies, and one of the following:
  - **AMST 502**, Introduction to African American Literature and Culture
  - **AMST 504**, Introduction to Native American Studies
- **AMST 603**, Photography and American Culture
- **AMST 604**, Landscape and American Culture
- **AMST 605**, Film in American Culture
- **AMST 607**, Religion in American Life and Thought
- **AMST 608**, Women Artists and Writers, 1850-Present
  - **AMST 609**, The African American Experience in the Twentieth Century
- **AMST 610**, New England Culture
- **AMST 611**, Indigenous New England
- **AMST 612**, Periods in American Culture
- **AMST 613**, Regions in American Culture
- **AMST 614**, Native American Studies Topics
- **AMST 615**, Asian American Studies Topics
- **AMST 620**, Internship
- **AMST 665**, Applied American Environmental Philosophy
- **AMST 695/6**, Special Topics in American Studies
- **AMST 697/8**, Seminar in American Studies
- **AMST 750**, Applied American Environmental Philosophy
- **AMST 795/6**, Independent Study

*These courses concentrate on issues of race, gender, or ethnicity in America.

**Elective Courses**

Electives are approved for the minor and announced each semester in the Time and Room Schedule and on the American Studies Web site, www.unh.edu/amstudies.

**Asian Studies**

**www.unh.edu/asiann-studies**

To appreciate the Asian peoples—their languages, their history, their society, their political economic systems—and the Asian experiences in the United States, the Asian Studies minor is designed to be broadly inclusive. Students are required to choose five courses from a variety of Asian courses offered at UNH, no more than three of which can be from one individual discipline. Students are strongly encouraged to enroll in Asian languages classes at UNH as well as explore Asian courses at other U.S. and Asian institutions. For further information, please contact Lawrence C. Reardon, coordinator, Department of Political Science, 241A Hutton Social Science Center, (603) 862-1858; e-mail chris.reardon@unh.edu.
ANTH 500E, People and Cultures of South Asia
ARTS 697, Arts of the Far East
CHIN 401/2, Elementary Chinese
CHIN 425, Introduction to Chinese Culture and Civilization
CHIN 503/4, Intermediate Chinese
CHIN 795/96, Independent Study in Chinese
CLAS 413/4, Elementary Sanskrit

Canadian Studies

A minor in Canadian studies brings together expertise currently held by UNH faculty into a systematic program of study allowing students to add to their major program interests a specialization in some aspect of Canadian society. Students will be exposed to courses and independent study opportunities in subject areas including Canadian history, geography, political science, sociology, health care and management, linguistics, natural resources, business, and Quebec language, literature, and culture.

Additionally, students will have opportunities to study in Canada through established study abroad opportunities between UNH and several universities in Quebec and Nova Scotia. The possibility for internships at, for example, the Canadian Embassy in Washington, D.C., also exists.

Please consult the Canadian studies Web site regularly for further information. Canadian Studies students are required to earn 20 credits.

Required Courses/16 credits
Four courses chosen from
HIST 567, History of Canada
GEOG 514, Geography of Canada and the US
FRN 526, Intro to Francophone Cultures
FRN 676, Topics in Francophone Cultures
FRN 785, Francophone Literatures
POlt 558, Government and Politics of Canada
HMP 750, Comparative Health Care Systems

Combined study abroad experience in Canada for up to 16 credits or
Study abroad experience in Canada for up to 4 cr. equivalent or independent study (up to 4 cr. equivalent) for a total of 16 credits

One course/4 cr. Independent study
This course can be taken in any department, but must be at the 700 level. The student will work with a willing faculty member who will supervise research having 100 percent Canadian content and which will result in a research paper.

Cinema Studies

The minor in cinema studies offers a variety of opportunities to study a predominant contemporary form of narrative, aesthetic, and social discourse: the moving photographic image. Film is the primary medium of study for the minor, but the cinematic practices of video and television may also be included as potential areas of interest. Courses consist of interdisciplinary approaches to the analysis of cinema, covering works from the silent period to the present, from the U.S. and other nations, and from “mainstream” and “alternative” groups. Students learn the art, geography, history, technology, economics, and theory of cinema, while also learning the language for analyzing its forms and practices. The minor allows for organized and meaningful study of the moving photographic image, from a wide range of scholarly interests and approaches which complement the increasingly significant place of cinema in many major disciplines and other programs. Students in this program become keenly aware of themselves as members of a culture of the moving photographic image.

Cinema studies students are required to take five courses. Students must earn at least a C- in each course and maintain a 2.00 grade-point average in courses taken for the minor. “Double counting” of minor course credits with major course credits will be left to the discretion of existing major departments, with the exception that no more than 8 credits, if approved, will “double count.” Courses in cinema studies should be taken in the following sequence: first, one introductory course, ENGL 533, or CMN 550, followed by one history or theory of film course LLC 540, followed by at least two of the more advanced and/or focused courses, and one of the elective courses.

Interested students should contact the Cinema minor coordinator, Piero Garofalo, Languages, Literatures, and Cultures, (603) 862-3769.

Introductory Course (one required)
ENGL 533, Introduction to Film Studies
CMN 550, Cinema and Society

History and Theory of Film (one required)
LLC 540 History of Film
ENGL 613, Film Theory

Advanced and/or Focused Courses (two required)
CMN 650, Critical Perspectives on Film
ENGL 616 A, Studies in Film: Genre
ENGL 616 B, Studies in Film: Authorship
ENGL 616 C, Studies in Film: Narrative and Style
GERM 523, Women and German Film
GERM 524, Special Topics in German Film
ITAL 525, Italian Cinema
LLC 440, Cultural Approaches to Film and Fascism
RUSS 426, Film and Communism
SOC 670, Sociology and Nonfiction Film

Elective Courses (one required)
Electives are drawn from an approved list of courses for the minor, which is compiled and announced every semester. Students may also choose from the advanced and/or focused courses. Elective courses have a significant cinema studies component and may have another disciplinary focus as well. Contributing departments and/or programs include: American studies, anthropology, arts, communication, English, French, geography, German, history, humanities, Italian, music, philosophy, political science, psychology, Russian, sociology, Spanish, theatre and dance, and women’s studies. Students should check with the cinema minor coordinator each semester for approval of the elective.

History and Philosophy of Science

What is science? When people ponder this question, they are often led to seek answers outside the sciences themselves. This interdisciplinary minor is planned to help students address historical and philosophical questions about science. In the history of science, we ask: How did we come to hold the beliefs we do about the natural world? How were the great scientists of the past led to the discoveries for which they are remembered? Why did people in the past have very different ideas on issues like the motions of the heavens or the nature of the human body? Is it a puzzling reality of world history that the human understanding of nature, society, and the mind has varied greatly with place and time. This intriguing variety also raises philosophical questions: What separates science from pseudoscience or religion? How can we decide whether scientific knowledge will have good or bad consequences for humanity? Can science ever reach the ultimate truth about the universe?
The minor in history and philosophy of science offers courses in such diverse departments as economics, history, mathematics, philosophy, and psychology. It presupposes no specialized scientific background and may be combined with any undergraduate major. Five 4-credit courses are required for the minor, with no more than three from any single department.

Students interested in taking the minor should contact the coordinator, Jan Golinski, Department of History, Horton Social Science Center; e-mail jan.golinski@unh.edu.

ECON 615, History of Economic Thought
ECON 698, Topics in Economics
ECON 798, Economic Problems
HIST 521, The Origins of Modern Science
HIST 522, Science in the Modern World
HIST 523, Introduction to the History of Science
HIST 621, 622, History of American Thought
HIST 651, 652, European Intellectual History
HIST 654, Topics in History of Science
HUMA 651, Humanities and Science: The Nature of Scientific Creativity
MATH 419, Evolution of Mathematics
PHIL 424, Science, Technology, and Society
PHIL 435, The Human Animal
PHIL 630, Philosophy of the Natural Sciences
PHIL 683, Technology: Philosophical and Ethical Issues
PHIL 725, Philosophy of the Social Sciences
PHIL 780, Special Topics in Philosophy
PSYC 591, Forensic Psychology
PSYC 591, Special Topics in Psychology
PHIL 741, Evolution of Mathematics
PHIL 751, The Great Psychologists
PSYC 591, Special Topics in Psychology
PHIL 770, History of Psychology
PSYC 771, Psychology in 20th-Century Thought and Society
*with approval

Humanities (HUMA)
www.unh.edu/humanities-program
(For course descriptions, see page 196.)

The Humanities minor studies the fundamental questions and issues of human civilization. (For a more complete description of the Humanities Program, see Humanities, page 38.) The minor consists of a minimum of 20 credits of academic work (five courses), with a minimum grade of C from the following courses:

Two courses from the S10/S11/S12/S13/S14/S15 sequence:
HUMA 510, The Ancient World: An Interdisciplinary Introduction
HUMA 511, The Medieval World: An Interdisciplinary Introduction
HUMA 512, The Renaissance and Early Modern: An Interdisciplinary Introduction
HUMA 513, The Modern World: An Interdisciplinary Introduction
HUMA 514, The Twentieth Century, Part I: 1900-1945
HUMA 515, The Twentieth Century, Part II: 1945-1999

Two courses from other Humanities Program courses, one of which should be at the 600-level
HUMA 401, Introduction to the Humanities
HUMA 444, Idea of University
HUMA 500, Critical Methods in the Humanities
HUMA 592, The Blues
HUMA 607, The American Character: Religion in American Life and Thought
HUMA 608, Arts and American Society: Women Writers and Artists, 1850-Present
HUMA 609, Ethnicity in America: The Black Experience in the Twentieth Century
HUMA 610, Regional Studies in America: New England Culture in Changing Times
HUMA 650, Humanities and the Law: The Problem of Justice in Western Civilization
HUMA 651, Humanities and Science: The Nature of Scientific Creativity
HUMA 730, Special Studies in the Humanities

Humanities Program Seminar
HUMA 700, Seminar in the Humanities or another approved course

For more information on the Humanities major or minor, please consult the coordinator, Catherine Peebles, G19 Murkland Hall, (603) 862-3638; e-mail huma@unh.edu.

Justice Studies Minor
www.unh.edu/justice-studies
(For course descriptions, see page 199. For program information on the dual major in justice studies, see page 39.)

Justice studies is an interdisciplinary area that blends topics from humanities departments (e.g., philosophy), social science departments (e.g., psychology, sociology, women's studies), and departments that include both humanities and social science faculty (e.g., history, political science), and professionally-oriented departments (education, family studies, social work). Some of the topics studied include courts, family violence, rights, substance abuse, juvenile justice, school law, children as witnesses, hate crimes, and community policing. The goal is to produce graduates who have a higher level of knowledge about law and justice in American society and in the world so that they will mature into more knowledgeable and effective citizens. The justice studies minor is intended for students who are looking for careers in the justice system but do not have the time in their academic schedule to complete the dual major program.

The minor in justice studies requires students to take a total of five courses (20 credits) each completed with a grade of C- or better in order to complete the program. Students are allowed to "double count" no more than two courses towards their major and minor, and are not allowed to take more than two courses from any one department (except for justice studies).

Required Courses
POLT 507, Politics of Crime and Justice, and/or SOC 515, Introduction to Criminology
JUST 401, Introduction to Justice Studies

Elective Courses
Students are required to select three elective courses from the Justice Studies approved course list. This list is approved and published yearly by the Justice Studies Executive Committee. Departmental offerings that are currently accepted for the minor include:

CD 717, Law of Community Planning (offered every other year)
CMN 698, Studying the Police
EC 718, Law of Natural Resources and Environment
EDUC 767, Students, Teachers and the Law
FS 794, Families and the Law
FS 797, Children, Adolescents and the Law
HMP 734, Health Law
HIST 497W, Crime and Punishment in Modern Society
HIST 509, Law in American Life
HIST 559/560, History of Great Britain
HIST 609, Special Topics: American Legal History
HMGT 625, Hospitality Law (only HMGT majors allowed)
HMGT 627, Employment Law
HUMA 650, Humanities and the Law: The Problem of Justice in Western Civilization
JUST 401, Introduction to Justice Studies
JUST 501, Justice Studies Research Methods
JUST 550/551, Mock Trial (must take year-long course)
JUST 601/602, Field Experience
JUST 650, Special Studies in Comparative Justice Systems
JUST 651, Field Studies in the Hungarian Justice System
JUST 695, Special Topics in Justice Studies (no more than two courses)
JUST 701, Senior Seminar (writing intensive course)
KIN 798, Sports Law
MGT 647, Business Law (only Business Administration, Accounting and Business Administration, and Management allowed)
MGT 648, Business Law II
NR 566, Wildlife Enforcement I
OES 552, Corrections, Treatment and Custody
OES 554, Juvenile Delinquency
PHIL 436, Social and Political Philosophy
PHIL 635, Philosophy of Law
PHIL 660, Law, Medicine and Morals
PHIL 701, Value Theory
PHIL 740, Advanced Topics in Philosophy of Law
POLT 407, Law and Society
POLT 507, Politics of Crime and Justice
POLT 508, Supreme Courts and the Constitution
POLT 513, Civil Rights and Liberties
POLT 520, Justice and the Political Community
POLT 660, Terrorism and Political Violence
POLT 701, The Courts and Public Policy
POLT 707, Criminal Justice Administration
POLT 708, Administrative Law
PSYC 591, Forensic Psychology
PSYC 755, Psychology of Law (Research Methods Prerequisite)
PSYC 756, Psychology of Crime and Justice (Research Methods Prerequisite)
PSYC 791, Advanced Topics: Psychology of Hate
RMP 772, Law and Public Policy in Leisure Services (must have junior/senior status)
SOC 515, Introductory Criminology (or MGT 507)
Students who are interested in minoring in the justice studies program will need to file an Intent to Minor form. This form is available in the Justice Studies Office or can be downloaded from the Web site at www.unh.edu/justice-studies. Offices are located in Room 202, Huddleston Hall, and are open Monday through Friday 9 a.m. to 12 p.m. and 1 p.m. to 4 p.m. For more information contact Professor Ellen Cohn at (603) 862-3197, e-mail ellen.cohn@unh.edu; or Deb-Brie Briand at (603) 862-1716, e-mail justice.studies@unh.edu.

Latin American Studies Minor
www.unh.edu/amstudies/latam.html

The Latin American Studies minor provides an interdisciplinary approach to the study of Latin America. People of Latin American or Latino heritage will soon comprise the largest minority group in the U.S. Knowledge of Latin America is especially valuable for students who plan to work in education, international organizations, government, social services and business, as well as for those who plan to undertake graduate study in Latin America. The minor requires five courses which represent three disciplines. Latin American History (HIST 531 or 532) is required. Spanish or Portuguese language courses through the intermediate level are required (completion of SPAN 504 or PORT 504 at UNH, or equivalent courses or equivalency testing). Academic study in Latin America is strongly recommended. Elective courses must be approved by the Latin American Studies minor coordinator or committee and at least 50 percent of any selected course must focus on Latin America.

Queer Studies Emphasis
www.unh.edu/queerstudies/index.html

The queer studies emphasis provides students with opportunities to research and understand the history, status, challenges, contributions, and changes in the lives of gay, lesbian, bisexual, and trans-gendered individuals and movements. This emphasis enables students to explore the relationship between gender and sexual orientation, and to understand queer discourse across the intellectual landscape, in the humanities, the arts, and the social sciences. The increasingly public face of queer life has generated new fields of study in the academy. As this new area evolves it provides a framework to address the phenomena of queer life and intellectual developments through the exploration of the ideas, social pressures, historical circumstances, constraints, and powers that guide queer communities.

The emphasis consists of interdisciplinary coursework in queer studies and is open to all students. Students who wish to pursue the queer studies emphasis should consult with the queer studies coordinator at queer.studies@unh.edu or contact the program through the women’s studies office (603) 862-2194.
Religious Studies
(For course descriptions, see page 237.)

Director: David Frankfurter

The religious studies program at the University of New Hampshire currently offers an interdisciplinary minor, bringing together courses in several fields that address religion as a cultural, logical, or expressive phenomenon in human history. A religious studies major is available through the self-designed major program. Religious studies courses at UNH avoid theological or confessional biases and emphasize multicultural tolerance and diversity.

Requirements of the religious studies minor include the basic two-semester sequence, History of World Religions (RS/HIST 483) and Patterns in World Religions (RS/HIST 484), the advanced Minors’ Seminar in Religious Studies to be taken one’s senior year (RS 699), and at least two other courses either cross-listed in religious studies, announced in the Religious Studies Bulletin, or otherwise relevant to the study of religion (by student’s petition to the program director). Students especially interested in religious studies are encouraged to combine the minor with further pertinent coursework in one of the established departments contributing to the program: history, philosophy, anthropology, and English. The religious studies self-designed major involves seven courses beyond the minor requirements, at least five of which are 600 or higher. The program director can aid in advising such a major program.

Courses included in the biannual Religious Studies Bulletin ordinarily have some degree of focus on issues related to the academic study of religion, conceptualizing religion or religious influences as a principal problem, asking comparative questions, and/or developing models of cross-cultural usefulness. Courses listed here are generally offered at least once every two years:

Historical-Cultural
RS/HIST 483, History of World Religions
HIST 585, Middle East History to the Medieval Islamic Era
HIST 587, Africa South of the Sahara
HIST 589, Islam in Africa
RS/ENGL/AMSTUD 607, Religion in American Life and Thought
RS/ANTH 617, Religion and Conflict in South Asia
HIST 642, Religious Conflict in Early Modern Europe
HIST 688, African Religions

Theoretical
PHIL 417, Philosophical Reflections on Religion
RS/HIST 484, Patterns in World Religions
ANTH 616, Religion, Culture, & Society
RS/HIST 682, Cults & Charisma
RS 699, Senior Seminar in Religious Studies
RS/ANTH 770, Anthropology of the Sinister

Textual
ENGL 518, The Bible as Literature
HIST/RS 576, The Hebrew Bible in Historical Context
HIST/RS 601, Seminar in Religious Texts
HIST/RS 689, The New Testament in Historical Context

Interested students should also be alert for special topics courses in history (HIST 600), English (ENGL 697/698), anthropology (ANTH 500), religious studies (RS 600), and other disciplines that might be relevant to the study of religion. Copies of the Religious Studies Bulletin, which includes all such courses each semester, can be picked up outside the director’s office.

Students interested in the religious studies minor should see the director to fill out an intent-to-minor form by the beginning of their junior year. For more information, consult the director, David Frankfurter, Department of History, 436, Horton Social Science Center, (603) 862-3015; e-mail davidtf@hopper.unh.edu.

Women’s Studies Minor
www.unh.edu/womens-studies
(For course descriptions, see page 246.)

The women’s studies minor offers students an interdisciplinary introduction to the status and contributions of women in various cultures and historical eras. (For a more complete description, see page 52.)

For the women’s studies minor, students must complete 20 credits of women’s studies courses. These must include WS 401, Introduction to Women’s Studies, and WS 798, Colloquium in Women’s Studies, normally taken at the beginning and end of the course sequence, respectively. It may be possible to substitute WS 797, (Internship) for WS 798, (Colloquium), but please discuss with your WS adviser. In between, students should select other women’s studies courses or cross-listed courses from departmental offerings.

Other women’s studies courses are WS 595, Special Topics in Women’s Studies; WS 632, Feminist Thought; WS 795, Independent Study; WS 796, Advanced Topics in Women’s Studies; and WS 797, Internships. Departmental offerings include the following regularly repeated courses:

ARTS 487, Themes and Images in Art: Major Mythic Images of Women
ARTS 690, Women Artists of the Nineteenth and Twentieth Centuries
CMN 567, Images of Gender in the Media
CMN 583, Gender and Expression
ECON 698, Topics in Economics: Women in Economic Development
ENGL 585, Introduction to Women in Literature
ENGL 586, Introduction to Women Writers

ENGL 685, Women’s Literary Traditions
ENGL 785, Major Women Writers
FS 545, Family Relations
FS 757, Race, Class, Gender, and Families
HIST 565, Women in Modern Europe
HIST 566, Women in American History
NURS 595, Women’s Health
PHIL 510, Philosophy and Feminism
SOC 630, Sociology of Gender

Students may complete the minor requirements by selecting from other courses that are offered as special topics by the departments. In the past, such offerings have included the following:

AMST 696/HIST 609, Women, Law, and Culture
ANSC 415, Women in Science
ARTS/ENGL/HUM 608, Arts in American Society: Women Writers and Artists, 1850 to Present
CMN 397, Rhetoric of Early Women’s Rights
CMN 696, Feminist Voices
EDUC 701, Sex Roles, Learning, and School Achievement
ENGL 694, GLBTQ Literature
ENGL 797, Shakespeare’s Sisters: Women Writers of the English Renaissance
FREN 525, French Women: Subject and Object
FREN 635, French Women in Life and Literature
GERM 520, Women in German Literature and Society
GERM 523, Women in German Film
HIST 665, Themes in Women’s History
FS 797, Race, Class, Gender, and the Family
PHIL 510, Philosophy and Feminism [Rev. 10/06]
SPAN 798, Women Writers of the 20th Century

Students who wish to minor in women’s studies should consult with the coordinator, 203 Huddleston Hall, (603) 862-2194.

Special Centers

Center for the Humanities

The Center for the Humanities, located in Huddleston Hall, was established in 1986 to support the arts and humanities at UNH. It currently involves approximately twelve departments and more than 125 faculty members from across the University, representing such fields as literature, fine arts, anthropology, philosophy, folklore, history, religious studies, foreign languages, and literature. The Center for New England Culture is a unit of the Humanities Center.

Participation in the activities of the center is open to faculty members from across the University who are interested in the humanities as they are broadly defined. The center acts as a forum for discussion and intellectual cross-fertilization regarding humanistic issues and perspectives; it fosters and supports creative research in the humanities, both within and among disciplines; it assists humanities faculty in their educational and curricular activities in general,
and in the development of interdisciplinary courses and programs in particular; it serves the humanities faculty, students, programs, and community by assisting in the development and dissemination of educational and research materials; it fosters and develops outreach activities in the humanities for the state and region; and it is a focus for the humanities within the University, the state, and the region.

Programs of Study

The bachelor of arts programs provide a broad liberal education with a concentration involving a minimum of 32 credits in a major field. Departments may specify certain (but not more than thirteen) required courses. Students must declare a major before the beginning of the junior year. Degree candidates also should satisfy the foreign language proficiency requirements by the start of their junior year. A bachelor of fine arts degree program and a bachelor of music degree program are also available.

Anthropology (ANTH)
www.unh.edu/anthropology/
(For course descriptions, see page 151.)
Chairperson: Stephen P. Reyna
Professors: Joe L. P. Lugalla, Stephen P. Reyna, Nina Glick Schiller
Associate Professors: Justus M. Ogembo, Robin E. Sheriff, Deborah Winslow
Assistant Professor: William A. Saturno

Anthropology asks the question: What does it mean to be human? We answer this fundamental query with a global perspective on the human condition as students explore both the similarity and diversity of human experience. Through courses that cover a wide range of societies throughout the world, we investigate the human condition, past and present. Introductory courses provide an overview of the fields of anthropology: social and cultural anthropology, archeology, physical anthropology and linguistics. More advanced courses provide the opportunity for students to pursue intensive study of particular topics in cross-cultural perspective. The department emphasizes critical thinking and writing skills and encourages close faculty/student contact in seminar courses and at the upper level. Students, in consultation with their academic adviser, have the opportunity to take courses in other departments that complement specific foci in anthropology.

At this time of increasing globalization, anthropology provides students with a broad overview of diverse peoples and cultures. Majors are therefore well-prepared to live in a rapidly changing world. The major both prepares students for graduate-level studies and serves as a foundation for a wide range of careers. With backgrounds in anthropology, our students become teachers, social workers, public policy experts, forensic investigators, health practitioners, primatologists, international business executives, and community and economic development specialists, as well as pursuing various other careers.

Majors must complete a minimum of 40 credits in anthropology with grades of C or better and in accordance with the following requirements:

**Required:**
ANTH 412 or 413
ANTH 511
ANTH 701
ANTH 702
2 additional courses numbered below 599 (of which 1 must focus on a specific geographical area)
4 additional courses numbered 600 or above (of which 2 must be in designated seminar format, one seminar at the 700-level)

ANTH 411 may not be applied toward the requirement for the major.
American Sign Language may not be applied toward the foreign language requirement.
Honors in major and senior thesis options are also available.

Students who declare a major in anthropology are expected to make steady progress towards fulfillment of major requirements. Normally, this means taking at least one anthropology course per semester until all of the requirements have been met. A student who has fulfilled most of the major requirements may request an exception to this policy from their adviser.

Students wishing to major in anthropology should consult with the anthropology chairperson.

The anthropology minor consists of 20 credits in anthropology courses with a C or better at least one of which must be numbered above 600.

Art and Art History (ARTS)
www.arts.unh.edu/
(For course descriptions, see page 153.)
Chairperson: Michael McConnell
Professors: David S. Andrew, Grant Drumheller, Patricia A. Emison, Craig A. Hood, Scott Schnepf, David R. Smith, Mara R. Witzling
Associate Professors: Eleanor M. Hight, Maryse Sears McConnell, Michael McConnell, Jennifer K. Moses, Langdon C. Quin
Assistant Professors: Benjamin S. Cariens, Brian W.K. Chu, Julee Holcombe
Affiliate Assistant Professor: Vicki C. Wright

The courses offered by the Department of Art and Art History provide an opportunity, within the liberal arts framework, for students to acquire a thorough knowledge of the basic means of visual expression, to study intensively the history of art, or to prepare themselves for a career in art teaching. In addition, these courses offer foundation experience for students who are interested in art but are majoring in other departments in the University. The Department of Art and Art History offers programs leading to a bachelor of arts degree in either studio art or art history and a bachelor of fine arts degree in studio art. Certification for art teaching in the public schools is also offered in cooperation with the Department of Education (see page 32).

The University reserves the right to retain selections from a student's work for a period of not more than two years.

Bachelor of Arts Curriculum (Studio)
Students selecting to work toward a bachelor of arts degree in studio art must complete a minimum of thirteen courses (52 credits), with a minimum grade of C- in each course.

**The following courses are required:**
ARTS 532, Introductory Drawing
ARTS 546, Introductory Painting
ARTS 567, Introductory Sculpture
ARTS 551, Photography

**One of the following**
ARTS 536, Introductory Printmaking: Intaglio
ARTS 537, Introductory Printmaking: Lithography

**One of the following**
ARTS 501, Ceramics
ARTS 525, Woodworking

**Three additional courses in a studio concentration**
ARTS 580, Survey of Art History I
ARTS 581, Survey of Art History II
Two 600-level art history courses

While these courses represent the minimum departmental requirements for the studio art major, students may wish to plan a program involving greater depth in one or several of the studio areas.

Art History Major
The art history major provides a comprehensive, in-depth study of Western art from the ancient world to the present and some exposure, as well, to non-Western cultures and artistic traditions. All courses in the program teach basic skills of interpretation and critical analysis within the framework of broad cultural perspectives that connect the visual arts to larger historical developments. They also teach
good writing and research skills. In addition, art history majors typically branch out into other fields, such as history, literature, and foreign languages. By the time they graduate, most majors are well equipped to pursue such traditional careers in the field as museum and gallery work, teaching, publishing, or librarianship. But because art historical education is so broad, it also prepares students for a variety of other, more flexible options, such as law, business, or architecture.

Students must complete a minimum of eleven courses (44 credits). Two introductory-level courses are required from one of the following: 1) ARTS 580 and 581; 2) ARTS 480 and one other 400-level art history; 3) ARTS 480 and one 500-level art history other than ARTS 580 or 581.

The upper-level requirements for the major include five 600- or 700-level courses (at least one each from the following categories: pre-Renaissance, Renaissance/Baroque, modern, and architectural history); and ARTS 795, Methods of Art History; ARTS 799, Seminar in Art History; ARTS 532, Introductory Drawing; and one other studio course. These courses must be completed with a minimum grade of C-. Art history majors receive preferential placement in ARTS 532. Students contemplating graduate school should learn German, and, if possible, either French, Italian, or another language relevant to their areas of interest.

Bachelor of Fine Arts Major

Incoming freshmen wishing to enter the bachelor of fine arts (B.F.A.) degree program must first apply for, and be admitted to, the bachelor of arts (B.A.) studio arts major. After taking the introductory studio art courses at UNH, interested students can then seek out two faculty members to sponsor their application for the B.F.A. program. Studio majors generally wait until they are well into the intermediate-level courses before submitting a portfolio for the B.F.A. review which is held before a full faculty committee twice a year.

The B.F.A. curriculum provides training for students who plan to enter professional graduate school or pursue careers as professional artists. Students selecting to work toward a B.F.A. degree must complete a minimum of 84 credits, with a minimum grade of C- in each course.

The following courses are required:
- ARTS 532, Introductory Drawing
- ARTS 546, Introductory Painting
- ARTS 551, Photography
- ARTS 567, Introductory Sculpture
- ARTS 580, Survey of Art History I
- ARTS 581, Survey of Art History II
- ARTS 598, Sophomore Seminar
- ARTS 632, Intermediate Drawing
- ARTS 798, Seminar/Senior Thesis (8 credits)

Six courses in a studio concentration

Three additional art electives

Two 600-level art history courses

The possible areas of concentration within the department are: 1) painting, 2) sculpture, and 3) individualized programs. Individualized programs may be designed in the following subject areas: a) ceramics, b) drawing, c) printmaking, d) photography, and e) furniture design. Proposals for individualized programs are accepted only by permission of the departmental chairperson, the major adviser, and the departmental bachelor of fine arts committee. Candidates applying for the bachelor of fine arts program are required to submit a portfolio to the B.F.A. committee, which meets each semester one week before preregistration.

Art Education Curriculum

The program in art education is organized into a five-year, teacher-education sequence. This curriculum is designed to prepare teachers of art in the public schools. The satisfactory completion of the B.A. studio art curriculum and required education courses and the fifth-year internship will satisfy the initial certification requirements for teachers of art in the public schools of New Hampshire and in most other states.

Art education majors may take accredited crafts courses at other institutions as art electives.

Minors in the Department of Art and Art History

All minors require five courses (20 credits). Students must receive a minimum grade of C- in all required courses. Only two courses from the art and history major requirements can be applied towards the minor.

A maximum of two courses (8 credits) may be transferred from another accredited institution, provided UNH has accepted them as transfer credits. Transfer courses must be a minimum of 3 credits. Students with transfer courses that are accepted with less than 4 semester credits must still meet the 20 credit requirement for completion of the minor.

Minor in Architectural Studies

The minor in architectural studies provides an interdisciplinary introduction to the history, theory, and methods of architecture and its symbolism. The program allows students who are interested in this field to receive programmatic recognition for their work. It is designed to assist those who a) are contemplating enrollment at a school of architecture; b) are particularly interested in architectural history; c) want to supplement their technical majors (e.g., civil engineering) with strong academic minors; or d) plan to pursue careers in preservation, education, community service, and public relations.

The minor in architectural studies consists of five courses (20 credits) distributed in the following way:

Two courses in architectural history chosen from
- ARTS 574, Architectural History
- ARTS 654, 17th- and 18th-Century American Architecture
- ARTS 655, Early Modern Architecture: Revolution to World War I
- ARTS 656, Contemporary Architecture: The Buildings of Our Times
- ARTS 799, Seminar in Art History
- ARTS 455, Introduction to Architecture
- ARTS 532, Introductory Drawing

An elective chosen in consultation with the program coordinator of the architectural studies minor (an additional course in architectural history, a studio course, or some other appropriate elective)

Admission to the architectural studies minor will be authorized by the program coordinator. Interested students should consult with the coordinator in advance of selecting the minor.

Minor in Art

The minor in art consists of five courses (20 credits) chosen from the offerings of the department, two of which must be at the 500 level or above.

Minor in Art History

The art history minor offers those majoring in other fields (including studio art) the chance to gain a serious knowledge of aspects of the history and meanings of Western art from antiquity to the modern world. Particularly for those working in history and the humanities, a minor in art history will provide new interdisciplinary perspectives on their major fields. The minor consists of five courses (20 credits) with a distribution that includes one introductory course from the 400-500 level and the remaining four courses chosen from the 600 level or above.

Minor in Studio Arts

The minor in studio arts consists of five courses (20 credits) with a distribution that includes Arts 532, Introductory Drawing; two studio courses from the 600 level or above; and two additional studio courses chosen from the offerings of the department.
Chinese (CHIN)
www.unh.edu/languages/LLC/index.htm
(For program description, see Languages, Literatures, and Cultures, page 40. For course descriptions, see page 160.)

Classics (CLAS)
www.unh.edu/classics/
(For program description, see Languages, Literatures, and Cultures, page 40. For course descriptions, see page 162.)

Communication (CMN)
www.unh.edu/communication/
(For course descriptions, see page 163.)
Chairperson: Lawrence J. Prelli
Professors: Beverly James, Sheila McNam, Joshua Meyrowitz, Lawrence J. Prelli
Associate Professors: Patrick J. Daley, Melissa D. Deem, James M. Farrell, Sally W. Jacoby, John Lannamann
Assistant Professors: Jennifer L. Borda, Carol Conaway, Mardi J. Kidwell
Lecturer: R. Michael Jackson

The Department of Communication offers a major that emphasizes a range of integrative studies in human communication, including rhetorical studies, media studies, and interpersonal/small group studies. Students are taught analysis of communication transactions through historical, critical, and empirical investigations. Students examine verbal, nonverbal, and mediated messages across a wide spectrum of communication interactions: interpersonal, small group, and mass. They explore connections and interrelationships among various types of communication, theoretical perspectives, and methodological approaches.

While the major emphasizes critical analysis and understanding grounded in theory and research, application of understanding to a variety of communication settings and processes is an important dimension of study.

Students wishing to declare communication as a major should contact the director for majors, Professor Patrick Daley, for application information and requirements.

Communication Major
Majors must complete nine courses (36 credits) with a 2.00 overall average in the major. The distribution of required courses for the major is as follows:

Three introductory courses
CMN 455, 456, and 457 (12 credits). Majors must earn a grade of C or better in each introductory course before moving on to the same area 500-level courses.

Three 500-level courses, one from each of the following areas
Media Studies (prerequisite: C or better in CMN 455): CMN 515, 519, 550, 567, 596
Rhetorical Studies (prerequisite: C or better in CMN 456): CMN 504, 507, 557, 597
Interpersonal Studies (prerequisite: C or better in CMN 457): CMN 503, 530, 572, 583, 598
Majors must earn a grade of C or better in all intermediate-level courses. CMN 599 cannot be used to fulfill an intermediate course requirement.

Three advanced courses from among any of the three areas of study (prerequisites: CMN 455, 456, and 457 with grades of C or better, and an area-relevant 500-level prerequisite course with a grade of C or better). Majors must earn a grade of C or better in all advanced-level courses.

A maximum of 4 credits of independent study (CMN 795) may be counted toward the major. CMN 799 (Honors Thesis) and CMN 796 (Commentary) cannot be used to fulfill an advanced course requirement.

Transfer students must complete 18 credits of their communication coursework at UNH to complete the major satisfactorily. Exchange students may transfer no more than 10 approved credits from another institution to be applied toward completion of the communication major at UNH.

Rhetoric and Public Address Minor
The rhetoric minor consists of five courses (20 credits). Students must complete CMN 456, Propaganda and Persuasion, with a grade of C or better. Any additional four rhetoric courses with a grade of C or better from the following list will satisfy the minor requirements; however, one of the listed 500-level courses is required prior to enrollment in any 600- or 700-level course: CMN 504, 507, 557, 600, 607, 645, 656, 657 (may be taken more than once, with different topics), 697, and 703.

Media Practices Option
This option is designed for qualified students who want to augment their Communication major at Durham with training in media production and applied media communication through courses in the Communication Arts Department at the Manchester Campus. Qualified students who meet all requirements will graduate with a BA degree in Communication with a Media Practices Option. In addition to Communication major requirements, students are required to take two designated media practices courses at the Manchester campus and complete a media practices internship (CMN 599). Students must maintain both an in-major and cumulative GPA of at least 2.5 to satisfactorily complete the Media Practices Option.

Education (EDUC)
www.unh.edu/education
(For course descriptions, see page 172.)
Chairperson: E. Scott Fletcher
Professors: Michael D. Andrew, John J. Carney, Todd A. DeMitchell, Ann L. Diller, Janet Elizabeth Falvey, David J. Hebert, Barbara E. Houston, Bruce L. Mallory, Sharon N. Oja
Research Professor: David C. Hagner
Affiliate Professor: Tom L. Franke
Affiliate Associate Professor: Wanda S. Mitchell
Assistant Professors: Vincent J. Connelly, Leslie J. Couse, Mary K. Fries, Suzanne E. Graham, John F. Hornstein, Loan T. Phan, Judy Sharkey
Research Assistant Professors: Cheryl Daly, Cheryl M. Jorgensen, Mary C. Schuh
Affiliate Assistant Professors: Cari A. Moorhead, Jeanne E. Ormrod
Clinical Assistant Professor: Jane Thompson
Lecturers: Timothy J. Churchard, Paul M. Loranger

Basic Programs
At the undergraduate level students have the opportunity to begin taking courses in teacher preparation programs which will lead to teacher licensing at the graduate level in elementary and secondary education. They may also wait to prepare to teach solely at the graduate level.

Students majoring in music, mathematics, nursery/kindergarten, and physical education have the option of participating in a five-year program leading to licensure and a graduate degree. Or they may choose the four-year option in those majors which leads to licensure at the undergraduate level. Students interested in the four-year option in these areas should contact the departments for information. Students interested in agriculture and occupational education should contact Professor Michael Andrew in the Department of Education.
Elementary teaching and most secondary areas require completion of a one-year graduate program which leads to a master's degree and teacher licensure. Most students who plan to teach in elementary and secondary schools apply to the Graduate School to complete a five-year program. In the five-year program students begin preparation for teaching at the undergraduate level with a semester of field experience (EDUC 500, Exploring Teaching) and professional coursework in education. Students complete a baccalaureate degree outside of education and move into a fifth year of study and a full-year internship leading to the M.Ed. or M.A.T. degree and licensure in teaching.

There are also opportunities for study or certification at the graduate level in administration, counseling, elementary and secondary teaching, early childhood, reading, special education, and adult and occupational education. The department encourages students interested in graduate study or in relevant undergraduate courses to meet with these graduate program coordinators in the Department of Education.

Students at the undergraduate level who are interested in special education or early childhood education can begin to complete prerequisite coursework for the graduate program leading to certification in special education (K-12) or early childhood education. For students seeking the M.Ed. in special education or early childhood education without certification in general education, it is not necessary to complete Education 500. For coursework that can be taken at the undergraduate level, students should see program advisers in the Department of Education.

Program Philosophy and Mission

Unit Mission Statement The following conceptual framework guides all of the programs which prepare professionals in education at the University of New Hampshire.

The professional education unit at the University of New Hampshire seeks to prepare practitioners who will become leaders in their own practice settings and within their profession, applying knowledge to improve education for all students and enrich the lives of clients. Immersion in subject matter, research, theory, and field-based experience provides a base for our graduates to make well-reasoned judgments in complex situations, render informed decisions, model exemplary practice, and take initiative for planned change.

* Students in the five-year program may combine their program for teacher licensure with a master’s program in their major field department.

Students learn to establish caring environments which celebrate individual differences and backgrounds while fostering cooperation and educational improvement. We stress reflective critical inquiry as a mode of study and community-building as a means for promoting change. We value and support both our students’ local practice and their broader leadership within the profession.

Mission of Programs in Teacher Education

The following mission statement gives direction to the basic and advanced programs in teacher education.

We seek to prepare beginning teachers who demonstrate excellence in classroom practice and who will become educational leaders. Our graduates will possess the knowledge, skills, and dispositions required for outstanding classroom practice and eventual leadership within the local school community and the larger education community.

Undergraduate Work toward Teacher Certification in Elementary and Secondary Education

Phase I. Enroll in Exploring Teaching: Education 500.

Students are encouraged to take EDUC 500, Exploring Teaching, as a sophomore, but completion during junior or senior year could also leave enough time for other education course requirements.

Exploring Teaching is also available through the Live, Learn, and Teach summer program, which is open to juniors and seniors. For information, contact the Department of Education, 209 Morrill Hall. A positive recommendation from the Exploring Teaching instructor is required before further coursework is taken in the teacher education program.

Phase II. Professional Coursework in Education at the Undergraduate Level

Education 500 is a prerequisite to further work in the teacher education program. An undergraduate receives a co-adviser in the Department of Education (usually the Exploring Teaching instructor). This co-adviser works with the students, along with the major adviser to plan the undergraduate portion of the five-year teacher education program.

Every student must take 4 credits in each of five areas (EDUC 700, Educational Structure and Change; EDUC 701, Human Development and Learning: Educational Psychology; EDUC 703, Alternative Teaching Models; EDUC 705, Alternative Perspectives on the Nature of Education; EDUC 751, Educating Exceptional Learners). EDUC 707, Teaching Reading through the Content Areas, is required for some secondary subject licensure areas. Elementary education students are required to have four methods courses: one each in the teaching of reading, mathematics, science, and social studies. Those who do not intend to use this coursework for initial licensing may enroll with instructor permission. All 700-level education courses at UNH are restricted to students with junior or senior standing. These courses may also be taken at the graduate 800-level.

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 above.

Phase III. Internship and Graduate Phase of the Teacher Education Program

Undergraduates should apply to the Graduate School by Nov. 1 in the first semester of the senior year for the final phase of the teacher education program.

The final phase of the program includes a full-year internship, electives, and a program portfolio and colloquium. This phase normally takes an academic year plus a summer to complete.

Students with an undergraduate G.P.A. of 3.2 or greater may be allowed to begin the program in the second semester of the senior year, earning a maximum of 8 graduate credits.

The year-long internship (EDUC 900/901) is part of the final stage of the five-year program. It meets the goals of increased clinical experience and better integration of theory and practice.

The internship is a teaching and learning experience in which the intern is involved in an elementary or secondary school over the course of an entire school year. Interns become a part of the school staff, sharing appropriate instructional tasks, and often carrying the full instructional duties in one or more classes.

Interns are mentored and supervised by a school staff member who is designated as a “cooperating teacher.” A UNH faculty member collaborates in intern supervision and conducts a weekly seminar for all interns with whom she is working.

The internship is a full-time experience for 6 graduate credits each semester. It typically begins in September and runs through May or June. Due to the intensive time commitment, it is recommended that, at most, only one course be taken in addition to the internship each semester.

Before the internship, all students will have completed a bachelor’s degree with a major outside of education. Because of this, they will possess a depth of knowledge in a
Admission to the Program

1. Undergraduate Grade-point Average
The undergraduate grade-point average of the middle 50 percent of students admitted to the graduate programs in teacher education falls in the range of 3.15-3.53.

2. The Graduate Record Examination Scores
The Graduate Record Examination (GRE) scores of the middle 50 percent of students admitted to the graduate programs in teacher education fall in the following range: Verbal, 410-550; Quantitative, 450-600; Analytical, 540-650.

3. Recommendations
Positive recommendations from EDUC 500, Exploring Teaching, or the equivalent and from those able to relay information about a candidate’s performance in teaching situations or related areas are important. Recommendations from undergraduate subject major professors are also important.

In our admission 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 students—each and every one; 3) the ability to interact positively with children and adults; 4) the 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 a given environment, especially in the context of a classroom; 7) the ability to make reasonable judgments in the context of complex situations that change from moment to moment; 8) the capacity for clear thinking and an ability to translate complex thoughts into simple and clear explanations; 9) superior academic skills: extensive knowledge of at least one major discipline, intellectual curiosity, and the ability to be open to the unknown; 10) a disposition to take charge of one's own learning, which includes the active pursuit of feedback and the willingness to take thoughtful risks.

Early Admission
Provision exists for UNH seniors to apply for early admission to the Graduate School, i.e., admission for the second semester of the senior year. Such candidates may petition to have up to 8 credits of graduate coursework simultaneously count toward the bachelor’s and master’s degree. A student must be admitted to the Graduate School before the start of the semester in which the course(s) will be taken in order to receive graduate credit. A minimum of a 3.2 cumulative grade-point average is required to qualify for early admission.

Students interested in early admission apply using the regular graduate school application.

Four-Year, Undergraduate Option
A bachelor's degree including a one-semester teaching requirement allows students to be recommended for licensure in certain specialized areas. Those areas are: mathematics, music, nursery/kindergarten education, and physical education.

These program options include a major appropriate for the licensure being sought, in addition to the following core professional courses or their equivalent: EDUC 500, Exploring Teaching; EDUC 700, Educational Structure and Change; EDUC 701, Human Development and Learning: Educational Psychology; EDUC 703, Alternative Teaching Models; EDUC 705, Alternative Perspectives on the Nature of Education; EDUC 751, Educating the Exceptional Learner; and EDUC 694, Supervised Student Teaching.

For admission to supervised student teaching, a minimum 2.50 overall (2.80 for nursery/kindergarten) grade-point average at the time of application is required. Applications are due by March 1 of the junior year for the fall semester and October 15 of the senior year for the spring semester, An unofficial transcript and a current résumé must accompany your application. Return applications to the Department of Education Office, 203 Morrill Hall.

Students may also become licensed for kindergarten through grade three (early childhood licensure) by completing the master's degree program in early childhood.

English (ENG)
www.unh.edu/english
(For course descriptions, see page 176.)

Chairperson: Janet Aikins Yount

The English Major

The English major has two chief objectives: to provide all students with a common core of literary experience and to provide each student with the opportunity of shaping a course of study to suit individual interests.

The flexibility and freedom inherent in the second of these objectives places a responsibility upon students to devise a program that has an intelligent rationale. For example, students with a strong interest in creative writing or linguistics may wish to take only the minimum number of advanced literature courses required for the major and fill their upper-division requirements with courses in the writing of fiction, poetry, creative non-fiction, or in the study of the English language, language formation, and other areas of linguistics. Students who intend to pursue graduate study in literature written in English should choose more than the minimum number of advanced literature courses and should seek a broad historical background. For these students, the "English Literature major" would perhaps be a more appropriate choice than the standard "English major." All students should secure the assistance and approval of their advisers in formulating an early plan for the major program.

For the English major, students must complete a minimum of 40 credits of major coursework with a grade of C- or better, with the exception of ENGL 419, which must be completed with a grade of C or better.

Students must complete ENGL 419, two 500-level courses (or one 500-level course and ENGL/LING 405), and seven courses numbered 600 and above. In selecting these courses, students must be sure to meet the following distribution requirements:

1. Two courses in literature written before 1800: either two advanced courses (numbered 600 or above), or one advanced course and ENGL 513.
2. Two courses in literature written since 1800: either two advanced courses, or one advanced course and one course from the following list: ENGL 514, 515, or 516.

Students interested in majoring in English should consult Susan Dumais, coordinator of the Department of English, (603) 862-1313.

The English Literature Major

The English Literature major offers students the opportunity for a focused and comprehensive study of literature written in the English language. The English Literature major engages students in the range of approaches to literary study that now characterize the field: the historical study of national traditions, literary theory, the study of texts in cultural context, genre studies, and the critical analysis of representations of identity, especially in terms of race, gender, ethnicity, and sexuality. It builds on the existing English major a series of requirements that ensure students’ greater immersion in literature, and it foregrounds research. In these ways, the program will be especially useful to those students who wish to go on to graduate school in English and other fields, as well as various kinds of professional training, including law school.

For students planning other career paths, the English Literature major will help them gain the ability to read critically, write papers that synthesize research results in a sustained analysis, and develop familiarity with the historical and cultural contexts that inform written expression. Beyond these more practical career concerns, this major is ideal for students who are passionate about reading fiction, poetry, creative nonfiction, and other kinds of imaginative literature.

For the English Literature major, students must complete a minimum of 40 credits of major coursework with a grade of C- or better, with the exception of ENGL 419, which must be completed with a grade of C or better. Additional requirements include two 500-level courses, one of which must be a survey course; ENGL 619; and ENGL 787. Seven courses must be completed at the 600 level or higher. In selecting courses, students must be sure to meet the following distribution requirements. Please note that, in many cases, a single course may satisfy a requirement in two or more categories.

1. Two courses in literature written prior to 1800. Either two advanced courses (600 level and above) or one advanced course and ENGL 513.
2. Two courses in literature written since 1800. Either two advanced courses or one advanced course and one of the following: ENGL 514, 515, or 516.
3. One American literature course at the 600/700 level.
4. One British literature course at the 600/700 level.
5. Two courses that investigate and question representations of identity (ENGL 517, 540, 555, 581, 585, 586, 681, 685, 690, 738, 739, 740, 775, 777); genre, including film, with the exception of ENGL 533 (616, 618, 630, 631, 632, 777); and/or theoretical positions (ENGL 713, 714). Other courses may count, when relevant and with prior written approval of the adviser.

Students interested in majoring in English Literature should consult Susan Dumais, coordinator of the Department of English, or the director of the English Literature program.

The English Teaching Major

This major is designed for students wishing to teach English in middle or high schools. Completion of this undergraduate major does not in itself, however, meet state certification requirements. To meet these requirements, students should enroll in the undergraduate major and, by September 15 of their senior year, apply for the fifth-year teaching internship and master’s degree program. (For a full description of the program, see page 32.) Undergraduate English Teaching majors must pass the following English courses with an average of 2.50 or better: ENGL 419, 514, 516, 619, 657, 725-726 or 710 and 792, 718 or 791, and two additional literature courses numbered 600 or above. ENGL 513 may be substituted for one of these two courses. A writing portfolio is also required.

Students interested in majoring in English Teaching should consult Susan Dumais, coordinator of the Department of English, or the director of the English Teaching program.
The English/Journalism Major
The English/Journalism major is designed for students considering careers in print journalism or related fields. Students who complete the program are ready for entry-level writing or editing positions on newspapers or magazines.

The program allows students to develop their writing, reporting, and editing skills while developing a strong background in English literature. English/Journalism majors must complete ENGL 419 with a grade of C or better and the literature requirements of the standard English major. In addition, they must complete ENGL 501 (Creative Nonfiction) and ENGL 621 (Newswriting) with a grade of B or better; ENGL 622 (Advanced Newswriting); at least one other on-campus journalism course (ENGL 703, 704, 711, 721, 722, 723); and a journalism internship (ENGL 720) approved by the director of the journalism program. Except where otherwise noted, major courses must be completed with a C- or better. Many journalism students work for the on-campus student newspaper, The New Hampshire. Many students hold summer jobs in journalism, and some have part-time journalism jobs during the school year.

Students interested in the English/Journalism major should see Susan Dumais, coordinator of the Department of English, or the director of the English/Journalism program.

Writing Programs
The Department of English offers courses for students interested in becoming writers. Up to four consecutive creative writing workshops can be taken in fiction or in poetry, as well as a course in form and theory of either genre. The instructors for these courses are professional writers. Interested students should inquire at the department office.

European Cultural Studies (ECS)
(For course descriptions, see page 182.)
European Cultural Studies (ECS) is an interdisciplinary major in which students study the field of cultural analysis in conjunction with an individually designed focus on a European topic. Each student will work with an adviser and the ECS Steering Committee to design a course of study that best suits the student's interests and goals. The ECS major is driven in part by the belief that language is an integral part of culture and not merely a tool for the study of literature. By the same token, the study of European history, philosophy, politics, and so forth, can only be enriched by the addition of critical perspectives developed in literature and language study.

The ECS major has five objectives:
1. It will introduce students to the major contours of European history, politics, languages and arts.
2. It will introduce students to the social, political, economic, and cultural developments of the new unifying Europe.
3. The cultural studies component of the major highlights the contentious nature of this "unifying Europe." Thus the major will prepare students for work in fields related to Europe and European/American relations. More generally it will encourage a nuanced perception of cultural differences, which will in turn affect students' perceptions of themselves and others as participants in an uneasily shared world.
4. Cultural studies skills will facilitate and enable students to consider the past not just as an academic subject but as an unfolding inherited tradition.
5. A B.A. in European cultural studies will be a preparatory degree for graduate study in numerous fields from international relations to the humanities.

European Cultural Studies Major
The ECS major consists of 40 credits to be distributed in the following way:
1. Course on Europe (ECS 400). Course on European topics, covering art, literature, history, political science or other domains. (4 credits)
2. Course on cultural studies (ECS 500). Introduction to the field of Cultural Studies as applied to the study of Europe. In years when ECS 500 is not offered, students may take ENGL 619 (Critical Approaches to Literature) or HIST 625 (Intellectual European History). (4 credits)
3. Foundation Courses (8 credits).  
a. Languages: 504 or equivalent in a European language or an approved alternate course.
b. Arts/Humanities or Social Sciences: One course from the following offerings: ARTS 580 or 581 (Survey of Art History), ENGL 651 or 652 (Comparative Literatures, when inclusive of European literatures), Humanities 501, 502, 503 (when focused on European topics), Music 402 (Survey of Music History), ECON 630 (Comparative Study of Economic Systems), HIST 435 or 436 (Western Civilization), HIST 565 (Women in European History), HIST 650 (European Socialism), HIST 656 (20th Century Europe), POLIT 550 (Major Foreign Governments), POLIT 552 (Contemporary European Politics).

4. Focus Courses: The focus of the major consists of an individually designed grouping of four courses that will allow students to pursue their interests and will give coherence to the major. Students will discuss their proposed curriculum with an ECS adviser and submit a proposal to the ECS Steering Committee. Possible foci include: European art and identity; politics and culture in modern Europe; history of European science and philosophy; focus by nation. At least two courses for the focus must be at the 600-level or higher (16 credits).

5. Course on Critical Methods in Cultural Studies prepares student for research and writing techniques needed to complete the senior thesis. (4 credits).

6. Senior Thesis (ECS 798/799). Students will work together with their advisers to formulate their topic, consider appropriate approaches, locate relevant resources and write a thesis. At the end of the semester, students present their work to a committee of three ECS faculty members (4 credits).

European Cultural Studies Minor
The minor in European cultural studies consists of 20 credits (five courses), including ECS 500, 504-level in a European language, two foundation courses in (one in arts/humanities, one in social sciences), and one elective.

French (FREN)
www.unh.edu/languages/LLC/French/index.htm
(For program description, see Languages, Literatures, and Cultures, page 39. For course descriptions, see page 40.)

Geography (GEOG)
www.unh.edu/geography
(For course descriptions, see page 186.)
Chairperson: Alasdair D. Drysdale
Professor: Alasdair D. Drysdale
Assistant Professor: Blake Gumprecht

Geography is best defined as the discipline that describes and analyzes the variable character, from place to place, of the Earth as the
The foreign language requirement may be met in any of the following: French, Italian, Spanish, Portuguese, German, Russian, Chinese, Japanese, Arabic, Latin, or Greek. Other languages may be considered by petition. Students interested in majoring or minoring in geography should consult with the supervisor, Alasdair Drysdale.

German (GERM)
www.unh.edu/languages/LLC/German/index.htm
(For program description, see Languages, Literatures, and Cultures, page 39. For course descriptions, see page 187.)

Greek (GREK)
www.unh.edu/languages/LLC/Classics/index.htm
(For program description, see Languages, Literatures, and Cultures, page 39. For course descriptions, see page 188.)

History (HIST)
www.unh.edu/history
(For course descriptions, see page 190.)

Chairperson: Jan V. Golinski
Professors: Jeffrey M. Diefendorf, Ellen Fitzpatrick, David Frankfurter, Cathy A. Frierson, Jan V. Golinski, J. William Harris, Janet L. Polasky, Harvard Sitkoff, William R. Woodward
Affiliate Professor: Stephen H. Hardy, Benjamin Harris, Laurel Ulrich, William R. Woodward
Associate Professors: Funso Afolayan, W. Jeffrey Bolster, Kurk Dorsey, Eliga H. Gould, Nicoletta F. Guibace, Yan Lu, Gregory McMahon, Julia E. Rodriguez, Lucy E. Salyer, Cynthia J. Van Zandt, Ethel Sara Wolper
Affiliate Associate Professor: Robert L. Macieski
Assistant Professors: David Bachrach, Molly Girard-Dorsey, Amanda Wunder
Research Assistant Professor: Judith N. Moyer
Lecturer: Richard M. Brabander, Jeffrey A. Fortin

The study of history is an essential element of the liberal education. The history major provides both an awareness of the past and the tools to evaluate and express one's knowledge. The student who majors in history will have the opportunity to study the breadth of the human past and will acquire the skills in critical reading and writing which form the foundation of the educated life. The study of history may include all of human culture and society and provides tremendous latitude in the subjects which may be studied. The interdisciplinary nature of the field makes it a natural focus for study which may encompass a variety of other fields.

To complete a major in history, students must take ten 4-credit history courses or their equivalent. Students who enter the University as history majors should plan to take the first required course, HIST 500 (Introduction to Historical Thinking) as soon as possible. To declare a major in history, students must have taken HIST 500 or have registered for it and have completed two other history courses with a C- or better. The second required course, HIST 797 (Colloquium in History), is usually taken during the senior year. Students should consult the list of topics for HIST 797 and may choose to complete HIST 797 in their junior year. Besides HIST 500 and HIST 797, a major must take at least eight courses, of which a minimum of three must be at the 600 level or above. Only one HIST 695 (Independent Study) may be used to fulfill the 600-level requirement, and no more than two independent study courses may count toward the ten-course requirement. No more than two 400-level courses may be counted toward the major requirements. Students must receive at least a C in HIST 500 and HIST 797, and at least a C- in the other eight courses. They must maintain a 2.00 or better in all history courses. General education courses offered by the department may be counted for major credit or for general education credit, but not for both.

A student's program of study must include two parts:

1. An area of specialization. A student must select at least four courses to serve as an area of specialization within the major. Up to two courses (each 4 credits or their equivalent) in the area of specialization may be taken in other departments; such courses must be 500 level or above and have the approval of the student's adviser. The area of specialization may be in a nation, region, a time period, or an interdisciplinary field.

2. Complementary courses. A student must select, in consultation with his or her adviser, at least three history courses in fields outside the area of specialization, chosen to broaden his or her understanding of the range of history. Normally, each major should take at least one course from each of Groups I, II, and III, unless explicitly excused by the student's adviser.
The program must be planned in consultation with an adviser. A copy of the program, signed by one's adviser, must be placed in one's file no later than the second semester of one's junior year. Courses at the 700-level will be judged by the adviser as to their applicability for area of specialization or complementation. The program may be modified with the adviser's approval.

For transfer students, a minimum of five of the semester courses used to fulfill the major requirements must be taken at the University. One upper-level course may be transferred to satisfy the requirement that a major must take at least three courses numbered 600 or above. Transfer students must complete both HIST 500 or its equivalent and HIST 797.

A minor in history consists of 20 semester credits with C- or better and at least a 2.00 grade-point average in courses that the Department of History approves. Courses taken on a pass/fail basis may not be used for the minor. No more than 12 credits in 400-level courses may be used for this minor. For transfer students, a minimum of two of the semester courses, or 8 credits, must be taken at the University of New Hampshire with a grade of C- or better.

Students intending further work in history beyond the bachelor's degree are urged to take HIST 775, Historical Methods.

Students intending to major in history should consult with the department secretary in Horton 405. Suggested programs for students with special interests or professional plans are available in the department office.

Undergraduate Awards for Majors
The Philip M. Marston Scholarship, an award of $500, is available to students who are interested in colonial or New England history and have demonstrated financial need. There are course requirements for this scholarship. More details are available from the history office.

Each spring, the members of the departmental undergraduate committee choose history majors to receive the following prizes in history:

The William Greenleaf Prize is given for the best senior colloquium paper. Award candidates must have a minimum grade-point average of 3.20 in history courses. Individuals may nominate themselves or may be nominated by faculty members.

The Allen Linden Prize for the best senior history thesis is funded by the Signal Fund.

The Charles Clark Prize is for the best essay or research paper submitted by a history major and is funded by the Signal Fund. Phi Alpha Theta, the history honor society, is an international scholastic organization dedicated to promoting historical study on the undergraduate and graduate levels. Admission to the UNH Psi Pi chapter is open to undergraduates with an overall grade-point average of 3.20 and a grade-point average of 3.20 or better in history courses.

Humanities (HUMA)
www.unh.edu/humanities-program
(For course descriptions, see page 196.)
Coordinator: Catherine M. Peebles
The Humanities Program examines the fundamental questions and issues of human civilization. Through studying diverse texts in the arts, music, literature, history, philosophy, and science, students seek answers to questions that thoughtful human beings must address in the course of their lives. Whether these questions come from Socrates (What is justice?), from Sir Thomas More (What is obligation to God?), from Raphael (What is beauty?), from Newton (What are the laws of nature?), or from Martin Luther King, Jr. (What is freedom?), they direct our attention to enduring human concerns and to texts that have suggested or illustrated the most profound and powerful answers.

Humanities Major
The humanities major consists of a minimum of 40 credits of academic work, with a minimum grade of C, including the following core requirements:

Critical Methods in the Humanities (HUMA 500). Students will be made acquainted with the methods and technology required for research in the humanities. Students should take this 4-credit course during the sophomore or junior year.

Integrated Core Courses (HUMA 510, 511, 512, 513, 514, 515). Each student takes at least two courses (8 credits) from the 510-515 sequence, preferably in the freshman and/or sophomore year.

Seminar in the Humanities (HUMA 700). Each student takes at least one offering (4 credits) of the Seminar in the Humanities, preferably during the junior or senior year. This seminar provides an opportunity for in-depth reading, viewing, and/or listening to texts and artifacts. The emphasis is on the multiple perspectives and methodologies that can be brought to bear upon these works from several humanistic disciplines.

Research Project in the Humanities (HUMA 798/799). Each student participates in the research seminar (for a total of 4 credits) throughout the senior year. The seminar provides a context within which students may discuss and receive directions in the course of completing a major research paper, the senior thesis. At the end of the second semester, students present their research to the faculty and their fellow students.

Additional Requirements. Beyond the 20 credits of core requirements, each student must fulfill the following requirements: 1) a minimum of 8 additional credits from other Humanities Program courses; 2) an additional 12 credits from Humanities Program offerings and from the offerings of other departments and programs, with the advice and approval of each student's major adviser or the program coordinator. These offerings should bear some relation to the student's particular interests and senior research paper, as seems appropriate in each individual case.

Humanities Minor
The humanities minor consists of the following courses: 1) two courses (8 credits) from the 510/511/512/513/514/515 sequence; 2) two courses (8 credits) from other Humanities Program courses, one of which should be at the 600-level; and 3) seminar in the humanities (HUMA 700) or another approved course.

Inquiries about the humanities major and minor should be directed to Catherine Peebles, coordinator of the Humanities Program, G19 Murkland Hall, (603) 862-3638; e-mail huma@unh.edu.

International Affairs Dual Major
(For program description, see Special University Programs, page 109.)

Italian Studies (ITAL)
www.unh.edu/languages/LLC/Italian/index.htm
(For program description, see Languages, Literatures, and Cultures, page 39. For course descriptions, see page 199.)

Japanese (JPN)
www.unh.edu/languages/LLC/index.htm
(For program description, see Languages, Literatures, and Cultures, page 39. For course descriptions, see page 199.)
Justice Studies Dual Major (JUST)
www.unh.edu/justice-studies/
The Justice Studies Dual Major Program is an interdisciplinary area that blends topics from humanities departments (e.g., philosophy), social science departments (e.g., psychology, sociology, women's studies), departments that include both humanities and social science faculty (history, political science), and professionally-oriented departments (education, family studies, social work). Some of the topics studied include courts, family violence, rights, substance abuse, juvenile justice, school law, children as witnesses, hate crimes and community policing. Students will be required to choose a first major before they will be able to declare justice studies as a second major. The goal is to produce graduates who have a higher level of knowledge about law and justice in American society and in the world so that they will mature into more knowledgeable and effective citizens. The justice studies dual major is intended for students who are looking for careers in the justice system or who seek graduate training in law or social sciences and humanities related to the law.

Required Courses
The dual major in justice studies requires students to take a minimum of eight courses (32 credits) each completed with a grade of C- or better. Students are required to have a GPA of a 2.5 or better before they can be accepted into the program. The dual major cannot be declared until after a first major has been declared. No more than two courses can count for the first major and dual major. An unlimited number of dual major courses can be used to satisfy general education requirements.

JUST 401, Introduction to Justice Studies
JUST 501, Justice Studies Research Methods (Prerequisite: a statistics course)
JUST 601, Field Experience (juniors/seniors only) or JUST 602, Research Field Experience (juniors/seniors only)
JUST 701, Senior Seminar (Writing Intensive Course)
POLT 407, Law and Society and/or
SOC 515, Introductory Criminology, and/or POLIT 507, Politics of Crime and Justice

Elective Courses
Students are required to select three elective courses from the Justice Studies approved course list. This list is approved and published yearly by the Justice Studies Executive Committee.

CD 717, Law of Community Planning (offered every other year)
CMN 698, Studying the Police
EC 718, Law of Natural Resources and Environment
EDUC 767, Students, Teachers and the Law
FS 797, Children, Adolescents and the Law
FS 794, Families and the Law
HMP 734, Health Law
HIST 497W, Crime and Punishment in Modern Society
HIST 509, Law in American Life
HIST 559/560, History of Great Britain
HIST 609, Special Topics: American Legal History
HMGT 625, Hospitality Law (only HMGT majors allowed)
HMGT 627, Employment Law
HUMA 650, Humanities and the Law: The Problem of Justice in Western Civilization
JUST 401, Introduction to Justice Studies (required course)
JUST 501, Justice Studies Research Methods (required course)
JUST 550/551, Mock Trial (must take year-long course)
JUST 601/620, Field Experience (required course)
JUST 650, Special Studies in Comparative Justice Systems
JUST 651, Field Studies in the Hungarian Justice System
JUST 695, Special Topics in Justice Studies (no more than two courses)
JUST 701, Senior Seminar (required course, writing intensive course)
KIN 798, Sports Law
MGT 647, Business Law (only Business Administration, Accounting and Business Administration and Management allowed)
MGT 648, Business Law II
NR 566, Wildlife Enforcement I
QES 552, Corrections Treatment and Custody
QES 554, Juvenile Delinquency
PHIL 436, Social and Political Philosophy
PHIL 635, Philosophy of Law
PHIL 660, Law, Medicine, and Morals
PHIL 701, Value Theory
PHIL 740, Advanced Topics in Philosophy of Law
POLT 407, Law and Society
POLT 507, Politics of Crime and Justice
POLT 508, Supreme Court and the Constitution
POLT 513, Civil Rights and Liberties
POLT 520, Justice and the Political Community
POLT 660, Terrorism and Political Violence
POLT 701, The Courts and Public Policy
POLT 707, Criminal Justice Administration
POLT 708, Administrative Law
PSYC 591, Forensic Psychology
PSYC 755, Psychology of Law (Research Methods Prerequisite)
PSYC 775, Psychology of Crime and Justice (Research Methods Prerequisite)
PSYC 791, Advanced Topics: Psychology of Hate
RMP 772, Law and Public Policy in Leisure Services (must have junior/senior status)
SOC 515, Introductory Criminology
SOC 525, Juvenile Crime and Delinquency
SOC 535, Homicide
SOC 620, Drugs and Society
SOC 650, Family Violence (must have junior/senior status)
SOC 655, Sociology of Crime and Justice
SOC 697, Special Topics: Perspectives on Terrorism
HIST 605, Criminological Theory
SOC 720, Sociology of Drug Use
SOC 780, Social Conflict
SOC 797, Special Topics: Crime and Justice
SW 525, Introduction to Social Welfare Policy
WS 595, Special Topics: Violence Against Women

Students who are interested in becoming a dual major in justice studies will need to file an Intent to Dual Major form. The form is available in the Justice Studies Office or can be downloaded from our Web site at www.unh.edu/justice-studies. Our offices are located in Room 202 of Huddlestone Hall and are open Monday through Friday from 9 a.m. to 12 p.m. and 1 p.m. to 4 p.m. For more information please contact Professor Ellen Cohn at (603) 862-3197, e-mail ellen.cohn@unh.edu; or Debbie Briand at (603) 862-1716, e-mail justice.studies@unh.edu.

For program information on the justice studies minor, see Interdisciplinary Programs, page 110.

Languages, Literatures, and Cultures (LLC)
www.unh.edu/languages/LLC/ (For course descriptions, see page 204.)
Chairperson: Edward T. Larkin, German
Professors: Barbara T. Cooper, French; Edward T. Larkin, German; Ronald D. LeBlanc, Russian; Nancy Lukens, German; Claire L. Malarte-Feldman, French
Associate Professors: Nadine S. Berenguer, French; Arna Beth Bronstein, Russian; Roger S. Brown, German; Stephen Andrew Brunet, Classics; John M. Chaston, Spanish; Marco Dorfman, Spanish; Aleksandra Fleszar, Russian; Carmen Garcia de la Rasilla, Spanish; Piero Garofalo, Italian; Janet Gold, Spanish; Lori Hopkins, Spanish; Lina Lee, Spanish; Mary E. Rhiel, German; Juliette M. Rogers, French; Robert Scott Smith, Classics; Stephen M. Trzaskoma, Classics
Assistant Professors: Richard E. Clairmont, Classics; Juane Marti-Olivella, Spanish;
Instructor: Nina Gatzoulis, Classics
Affiliate Faculty: Richard C. House, Director, Parker Language Resource Center
Lecturers: Mary Kathleen Belford, Spanish; Mayder Dravasa, Italian; Johannes Frank, German; Claire-Hélène S. Gaudissart, French; Kathleen Hill, Spanish; Darby Tench Leicht, Italian; Cindy Pulkinen, Spanish; Anna K. Sandstrom, French; Katherine E. Stansfield, French; Elisa F. Stoykovich, Spanish; Linda J. Thomesen, Spanish

The Department of Languages, Literatures, and Cultures offers undergraduate majors in Classics, French, French Studies, German, Greek, Latin, Russian, Spanish, and European Cultural Studies, plus a minor in Italian and coursework in Chinese, Hittite, Sanskrit, Japanese, and Portuguese. A combined B.A. in French/M.B.A. degree and an M.A. in Spanish are also offered.

In addition, the department sponsors several study abroad programs and a variety of co-curricular activities including conversation hours and language clubs.

A B.A. degree at the University requires the fulfillment of a foreign language requirement. Students must fulfill this requirement by the end of their sophomore year. Please see the Bachelor of Arts Degree Requirements, page 18.
Undergraduates who choose to pursue a major or minor in the Department of Languages, Literatures, and Cultures may wish to consider complementing their studies with the dual major in International Affairs, with the teacher education program, or with any of the other majors and minors available through the University of New Hampshire. Such coursework will not only broaden a student’s intellectual horizons, but may also serve to enhance his or her employment opportunities or prospects for graduate education.

**Chinese (CHIN)**

www.unh.edu/languages/LLC/index.htm

(For course descriptions, see page 160.)

**Classics (CLAS)**

www.unh.edu/classes/

(For course descriptions, see page 162.)

**Associate Professors:** Stephen A. Brunet, Robert Scott Smith, Stephen M. Trzaskoma

**Assistant Professor:** Richard E. Clairmont

While it is true that classical Greek and Latin are no longer spoken languages, the literature and art of the Ancients speak to us still. To study the classics is to come into direct contact with the sources of Western civilization and culture, both pagan and Christian. An intimate knowledge of our Greco-Roman heritage furnishes students of the classics with historical, political, and aesthetic perspectives on the contemporary world. An undergraduate classics major provides excellent preparations for careers not only in academic, but also in nonacademic professions.

A background in classics is, moreover, highly advantageous for applicants to graduate and professional schools in English, modern languages, history, philosophy, law, medicine, and theology. Finally, for the qualified student who is undecided about a major but is interested in a sound liberal arts education, classics may be the best option.

The classics major is offered by the classics program of the Department of Languages, Literatures, and Cultures. The minimum requirements for a major in classics are 40 credits offered by the classics program. Twenty-four of these must be in Greek and/or Latin. A classics major must complete as a minimum a 700-level course in one of the classical languages. A minimum of three courses must be taken at the Durham campus. Students will be encouraged to take courses in related fields such as ancient history, classical art, modern languages, and English, and to take part in overseas study programs in Greece and Italy.

A minor in classics consists of five courses (20 credits) in classics, Greek, and/or Latin. The coordinator is R. Scott Smith, Murkland Hall; Languages, Literatures, and Cultures, (603) 862-2388; e-mail rss3@cisunix.unh.edu.

**French (FREN)**

www.unh.edu/languages/LLC/French/index.htm

(For course descriptions, see page 184.)

**Professors:** Barbara T. Cooper, Claire Malarte-Feldman

**Associate Professors:** Nadine S. Bérenguier, Juliette M. Rogers

**Lecturers:** Claire-Hélène S. Gaudissart, Anna K. Sandstrom, Katharine E. Stansfield

The French major offered by the Department of Languages, Literatures, and Cultures provides knowledge of the language, literature, and culture of France and other French-speaking countries around the world. An undergraduate major in French is useful in a variety of careers, such as business, law, government or public service, and teaching. Students considering a career in teaching should consult with the Department of Education.

In addition, they should include LING 505 (which also satisfies a general education requirement for group 7) in their overall program and make special note of the FREN 791 requirement (which does not count toward completion of a major in French). Students interested in other types of careers are urged to consult with members of the French faculty and with other appropriate departments early in their studies.

A major consists of 40 credits in courses numbered 631 or above, in which readings are in French. Coursework for the French major must be completed with a grade of C or better. Majors are required to take FREN 631-632, 651, 652, 790, and at least two 700-level literature courses at the Durham campus. Students are required to enroll in at least one course each semester in their major program and to spend at least one semester abroad in a French-speaking country. The year-long UNH Junior Year in Dijon Program is highly recommended. Students are required to enroll in at least one French course each semester. Transfer students must earn a minimum of 12 credits on the Durham campus. Of these 12 credits, one course must be FREN 790 and at least one 700-level course in French/Francophone literature.

**The French Minor**

A minor in French consists of 20 credits in French courses numbered 503 and above. No fewer than three courses have to be taken at UNH. No more than one course conducted in English (e.g., FREN 525, 526, 527, 621, 622) will be counted toward the minor, although students may elect to take more than one such course provided they earn more than 20 credits. Those entering the minor at FREN 504 or higher will be expected to complete FREN 651 or 652. FREN 791 does not count for the minor. Members of the department supervise the work of both majors and minors.
The French Studies Minor

The minor in French studies consists of 20 credits numbered FREN 503 or above. No fewer than three courses have to be taken at UNH. No more than one course conducted in English (FREN 525, 526, 527, 621, 622) will be counted toward the minor. Students entering the minor at FREN 504 or higher will be expected to complete FREN 651 or 652. FREN 791 does not count toward the minor. Members of the department supervise the work of both majors and minors.

Study Abroad in Dijon

The department offers a junior year and spring semester abroad at the University of Burgundy in Dijon, France (see FREN 690). This program is open to all qualified students at the University of New Hampshire who have completed, with a grade of B- or better, FREN 631-632, 651 or 652 by the end of their sophomore year. Early consultation with the director of the program is urged. Non-credit orientation meetings are required during the semester prior to departure.

Study Abroad in Brest

In addition to its summer school offerings at the Durham campus, the department sponsors a program at the Centre International d’Etudes des Langues (CIEL) in Brest, France, where students may enroll in courses equivalent to FREN 503, 504, 631, and 632, and above. Students interested in this program should consult the program’s on-campus director early spring semester. This program is open to majors, minors, and other interested students.

Study Abroad in Paris

Students attend the University of Delaware program in Paris where they take one French language course-ranging from intermediate (FREN 503) to advanced (FREN 632) - and three or four other courses taught in English on French topics. Full semester credit, gen. ed. 5 credit. Two courses can be applied toward the French or French studies minor. Students should consult with the program director at the beginning of the fall semester. This program is not for French majors or French Studies majors.

Teaching Assistantship in France

Each year the French government offers a teaching assistantship in a French secondary school to a graduating French major nominated by the department. Applications are accepted during the fall semester.

Five-Year Program in French and Business Administration

This program permits students to earn both a B.A. in French and an M.B.A. in five years. Students must meet all requirements for both the French major and the M.B.A. program offered by the Whittemore School of Business and Economics. Students interested in this program should consult with the departmental adviser to the program early in their freshman year.

German (GERM)
www.unh.edu/languages/LLC/German/index.htm

(For course descriptions, see page 187.)

Professors: Edward T. Larkin, Nancy Lukens
Associate Professors: Roger S. Brown, Mary E. Rhiel

The German major is offered by the Department of Languages, Literatures, and Cultures. This program is of interest to the following groups of students:

- Those who have a special interest in the German language, literature, and culture.
- Those who intend to enter fields in which a background in foreign languages and literatures is desirable, such as international business and law, trade, journalism, science, library science, government service, and international service organizations.
- Those who plan to teach German in secondary schools. Since most secondary schools require their teachers to teach more than one subject, students planning to enter teaching at this level should plan their programs carefully. They should combine a major in one of the languages and its literature with a minor or at least a meaningful sequence of courses in another subject. Dual majors are also possible. For certification requirements, see the section coordinator.

A major consists of 10 courses in German beyond German 402. Required for the major are GERM 503, 504, 525, 601, 631, 632 (or their equivalents) and 4 more courses which must be taken on the 600 or 700 levels. Majors are required to spend a minimum of one semester in an approved German-speaking study abroad program, or equivalent. For students spending one semester abroad, 3 of the 4 upper-level courses are normally taken in Durham. For students spending an academic year abroad, 2 of the 4 upper-level courses are normally taken in Durham. GERM 791 does not count for major credit: 791 is recommended as an elective and required for teacher certification.

A minor consists of 5 courses in German numbered 503 and above. The minor may include one course taught in English (521, 523, 524, 525) but not 791.

Study Abroad

(See also INCO 685, 686, GERM 585.)

The University allows both German majors and minors and other students at levels beyond GERM 504 to attend approved Study Abroad programs for UNH credit. UNH is part of the New England Universities consortium (Maine, Vermont, Connecticut, and Rhode Island) which sponsors a program in Salzburg, Austria. UNH students get a discount on Salzburg Program tuition and have an easy transferal of credits. Students may also attend other accredited semester or year programs at universities such as Berlin, Freiburg, Heidelberg, Innsbruck, Marburg, Munich, Tübingen, or Vienna. Most Study Abroad programs require a minimum of two years of college German. For intensive language study at any level, students may attend Goethe-Institut centers in Germany for one or more four or eight-week courses. For details, see the foreign study coordinator, Center for International Education, or the German coordinator. Students beyond the 504 level may also do an internship in a German firm or organization (see GERM 595). Financial aid applies to all approved programs.

Greek (GREK)
www.unh.edu/classics

(For course descriptions, see page 188.)

Associate Professors: Stephen Andrew Brunet, Robert Scott Smith, Stephen M. Trzaskoma
Assistant Professor: Richard F. Clairmont

The Greek major is offered by the classics program of the Department of Languages, Literatures, and Cultures.

The minimum requirements for a major in Greek are: 32 credits in Greek, including GREK 401-402. A Greek major must complete as a minimum a 700-level course in the Greek language. A minimum of three courses must be taken at the Durham campus. A Greek minor requires 20 credits of coursework in Greek. Students are encouraged to take courses in related fields such as Latin, classics, and ancient history, and to take part in overseas study programs in Greece. The coordinator is R. Scott Smith, Marklund Hall; Languages, Literatures, and Cultures, (603) 862-2388; e-mail rss3@cisunix.unh.edu.
Italian Studies (ITAL)
www.unh.edu/languages/LLC/ITAL/index.htm
(For course descriptions, see page 199.)

Associate Professor: Piero Garofalo

The Italian Studies minor is offered by the Department of Languages, Literatures, and Cultures. It provides students with the opportunity to explore the language, culture, and society of Italy through an interdisciplinary program. The minor consists of five courses beyond the Elementary Italian (ITAL 401-402) sequence and may include one course from a related field of study (e.g., ARTS 681-682, ECS 400, HIST 641) with a minimum grade of C. In addition, students must demonstrate linguistic proficiency at the level of intermediate Italian (ITAL 504 or an equivalent).

The Italian Studies Minor is advantageous for applicants to graduate and professional schools in Italian, modern languages, linguistics, film, history, theater, philosophy, and law. It is also a valuable asset for careers in economics, international affairs, international business, fashion, teaching, communications, translation, interpretation, government, and Foreign Service.

New students will be assigned to the proper course in consultation with the section coordinator.

Study Abroad
Students may participate in the UNH-in-Italy Program in the medieval city of Ascoli Piceno for a semester, year, or summer (see ITAL 684-686). The program allows students to register for UNH courses taught by UNH faculty. Students with advanced language skills may also enroll in courses at the University of Ascoli Piceno. Internships are also available. There is no language prerequisite.

Japanese (JPN)
www.unh.edu/languages/LLC/index.htm
(For course descriptions, see page 199.)

Latin (LATN)
www.unh.edu/classics
(For course descriptions, see page 204.)

Associate Professors: Stephen Andrew Brunet, Robert Scott Smith, Stephen M. Tzaskoma
Assistant Professor: Richard E. Clairmont

The Latin major is offered by the classics program of the Department of Languages, Literatures, and Cultures.

The minimum requirements for a major in Latin are 32 credits in Latin, excluding LATN 401-402. A Latin major must complete as a minimum a 700-level course in the Latin language. A minimum of three courses must be taken at the Durham campus. A Latin minor requires 20 credits of coursework in Latin. Students are encouraged to take courses in related fields such as Greek, classics, and ancient history, and to take part in overseas study programs in Italy. The coordinator is R. Scott Smith, Murkland Hall; Languages, Literatures, and Cultures, (603) 862-2388; e-mail: rss3@cisunix.unh.edu.

Portuguese (PORT)
www.unh.edu/languages/LLC/index.htm
(For course descriptions, see page 233.)

Russian (RUSS)
www.unh.edu/languages/LLC/Russian/index.htm
(For course descriptions, see page 237.)

Professor: Ronald D. LeBlanc
Associate Professors: Arna Beth Bronstein, Aleksandra Fleszar

The Russian major provides students with an opportunity to study one of the world’s most important languages, its literature, and its culture. In addition to the intrinsic value of Russian language, literature, and culture as a liberal arts experience, the Russian major leads to a number of careers, such as teaching, translation and interpreting, government, and foreign service. It is also a valuable asset in preparing for careers in law, economics, and international trade, and it can serve as a double major with business administration, international affairs, the natural and physical sciences, and other liberal arts fields such as English, history, political science, sociology, philosophy, theatre, communication, linguistics, and other foreign languages.

New students will be assigned to the proper course after consultation with the Russian faculty. A student may not receive UNH credit for elementary Russian courses if he or she has had two or more years of secondary school Russian; however, a student may petition the Russian program to be admitted to the 400-level courses for credit. In the 401-790 range, a grade of C or better is required to advance to the next course in the language series (401, 402, 503, 504, 631, 632, 790).

The Russian major consists of a minimum of 40 credits above RUSS 504. Specific course requirements are RUSS 425, 521, 522, 601, 631-632, 691, and 790 and two or three electives depending upon choice of option and concentration. Majors are required to spend a semester or summer on an approved study abroad program in Russia. Majors are required to take RUSS 631-632 and at least one 700-level Russian course at the Durham campus. Transfer students must earn a minimum of 12 major credits at the Durham campus.

The minor in Russian consists of a minimum of 20 credits above RUSS 402; it must include RUSS 503-504 and at least one of the following: RUSS 631, 632, 691, 721, 725, or 790.

Students wishing to major in Russian should contact the program coordinator in Murkland Hall.

Spanish (SPAN)
www.unh.edu/languages/LLC/index.htm
(For course descriptions, see page 241.)

Associate Professors: John M. Chaston, Marco D. Dorfsman, Carmen Garcia de la Rasilla, Janet Gold, Lori Hopkins, Lina Lee
Assistant Professor: Jaume Marti-Olivella

Lecturers: Mary Kathleen Belford, Kathleen Hill, Cindy Pulkkinen, Elisa F. Stoykovich, Linda J. Thomesen

The major in Spanish is offered by the Department of Languages, Literatures, and Cultures. It is designed for students who wish to acquaint themselves more thoroughly with the language, culture, and literature of the Spanish-speaking peoples. In addition, the department offers courses in Portuguese. Students also have the option to complete honors in major.

Students who major in Spanish may prepare themselves for a variety of fields in which proficiency in the Spanish language and knowledge of Hispanic cultures are desirable. Such fields might include international relations, business administration, government work, social service, and communications. In

College of Liberal Arts
addition, students can prepare to teach Spanish at the elementary and secondary levels and in bilingual education programs through the foreign language teacher education program. The undergraduate major also provides a basis for graduate study in preparation for scholarly research and teaching at the college level. When combined with coursework or a dual major in other disciplines, the major prepares students for work in Spanish-speaking areas of the world as well as in bilingual regions of the United States.

The UNH study abroad program in Granada, Spain, open to majors and nonmajors, offers students the opportunity to live and study abroad for a semester or a full academic year. A six-week summer immersion program in Puebla, Mexico is also available to students. Financial aid is available for eligible students. Contact the departmental program directors for further information.

The major consists of a minimum of 40 credits. All coursework required for the Spanish major or minor must be completed with a grade of C or better. Specific course requirements are 1) language and culture: 525 or 526, 601, 631, and 632; 2) three of the following 600-level courses: 650, 651, 652, 653, 654 or equivalent; 3) three courses taught in Spanish at the 700 level. An approved foreign study experience in a Spanish-speaking country of a minimum of one semester is required; a full academic year is highly recommended. The Spanish minor consists of 20 credits in courses numbered 503 and above, including 631 and 632.

For more information on the major, the minor, and options for the study abroad experience, please see the coordinator of Spanish.

Linguistics (LING)
www.unh.edu/linguistics/
(For course descriptions, see page 205.)

Professors: Thomas Carnicelli, English; Mary Clark, English; Willem deVries, Philosophy; Rochelle Lieber, English
Associate Professors: John Chaston, Spanish; Aleksandra Fleszar, Russian; Piero Garofalo, Italian; Sally Jacoby, Communication; Lina Lee, Spanish; Fred C. Lewis, Communication Disorders; John E. Limber, Psychology; Aya Matsuda, English; Gregory McMahon, History; Paul McNamara, Philosophy; Naomi Nagy, English; Penelope Webster, Communication Disorders; James Weiner, Computer Science
Assistant Professors: Richard Clairmont, Classics; Mardi Kidwell, Communication

Linguistics is the study of one of the most important characteristics of human beings—language. It cuts across the boundaries between the sciences and the humanities. The program is an excellent liberal arts major or preprofessional major for education, law, medicine, clergy, and others. It is a particularly appropriate major for students who want to teach English as a second language. Dual majors with a foreign language, International Affairs, business administration, and the like, are quite feasible.

Students interested in the major or the minor should consult with the program coordinator or with any professor who teaches linguistics courses. To declare a major in linguistics, a student must meet with the linguistics coordinator to design a course of study. Information is available from the Advising Center, Hood House, and at www.unh.edu/linguistics.

A minor in linguistics is also available and consists of any five linguistics courses, including LING 405 or ENGL 405, approved by the linguistics coordinator.

Requirements for the Major
All of the following
LING 405, Introduction to Linguistics
LING 605, Introduction to Linguistic Analysis
LING 793, Phonetics and Phonology
LING 794, Syntax and Semantic Theory

One course in historical linguistics
CLAS 506, Introduction to Comparative and Historical Linguistics
ENGL 752, History of the English Language
GERM 733, History and Structure of the German Language
ITAL 733, History of Italian
RUSS 733, History and Development of the Russian Language
SPAN 733, History of the Spanish Language

Two years college study (or equivalent) of one foreign language

One of the following cognate specialties
One year college study (or equivalent) of a second foreign language from a different language family or subfamily (Old English may count as the second foreign language if the first foreign language is not in the Germanic family)
PSYC 712, Psychology of Language (with its prerequisite, either PSYC 512, Psychology of Primate, or PSYC 513, Cognitive Psychology)
PHIL 745, Philosophy of Language (with its prerequisite PHIL 412, Beginning Logic, or PHIL 550, Logic)
CS 765, Introduction to Computational Linguistics (with its prerequisite)

Two elective courses from the list below
Anthropology: 670, Language and Culture; 795, 796, Reading and Research in Anthropology: B. Anthropological Linguistics
Communication: 572, Language and Behavior; 583, Gender and Communication; CMN 666, Conversation Analysis; 672, Theories of Language and Discourse
Psychology: 712, Psychology of Language. (Students may count either PSYC 512 or 513 toward the linguistics major or minor, but not both.)
Russian: 733, History and Development of the Russian Language
Sociology: 797, Sociolinguistics
Spanish: 601, Spanish Phonetics; 645, Introduction to Spanish Linguistics; 733, History of the Spanish Language; 790, Grammaratical Structure of Spanish

Capstone Experience
Either LING 779, Linguistic Field Methods, or LING 695, Senior Thesis.

Other courses may be substituted, with the permission of the student’s adviser and the Linguistics Committee, when they are pertinent to the needs of the student’s program.

Music (MUSI)
www.unh.edu/music/
(For course descriptions, see page 215.)

Chairperson: Mark S. DeTurk
Professors: Christopher Kies, Nicholas N. Orovich, David E. Seiler, Robert Stabler, Peggy A. Vagts
Affiliate Professor: Clark Terry
Associate Professors: Michael J. Annichiarico, Daniel Beller-McKenna, Andrew A. Boyse, Mark S. DeTurk, Lori E. Dobbins, Robert W. Eshbach, William G. Kempster, David K. Ripley, Peter W. Urquhart, Larry J. Veal
Assistant Professors: Jenni Carbaugh Cook, Robert Haskins
Lecturers: Casey S. Goodwin, Arlene P. Kies
Adjunct Faculty: Sharon Baker, Kendall Betts, Mimi Bravari, Les Harris, Jr., Margaret Herley, John B. Hunter, David Newsam, Janet E. Polk, Mark Shilansky, Jared Sims, Nancy Smith

The Department of Music offers two degree programs: the bachelor of arts in music and the bachelor of music.
The bachelor of arts program offers students an opportunity to major in music within the liberal arts curriculum. This program is intended for those who wish to pursue the serious study of music and to acquire at the same time a broad general education; it is recommended for those considering the five-year undergraduate-graduate program in teacher education or graduate study leading to the M.A. or Ph.D. degrees.

To be admitted formally to the B.A. program, students must give evidence of satisfactory musical training by taking an admission audition. Students must declare music as a major before the beginning of the junior year, but it is highly recommended that they declare as early as possible, considering the large number of required courses.

The bachelor of arts degree is offered with four options: music history, performance study, music theory, and preteaching. The B.A. may also be taken as a degree in music with no option specified. We refer to this as the undifferentiated B.A. in music. Students wanting to declare theory as their option must submit a music portfolio in addition to an audition on the major instrument. Students must declare a music as a major before the beginning of the sophomore year. Continuation into the upper level of the program is subject to review by the department faculty.

Three degrees are offered in the bachelor of music curriculum: Bachelor of Music in Performance; Bachelor of Music in Theory; Bachelor of Music in Education. Students wanting to declare theory as their option must submit a music portfolio in addition to an audition on their major instrument.

Students in music education must maintain an overall minimum 2.50 grade-point average at the time of application for student teaching (February 15 of junior year). Techniques and methods courses must include MUSE 745 (strings), 741 (choral), 747 (woodwinds), 749 (brass), 751 (percussion), and 765 (instrumental).

The Bachelor of Music program in Music Education leads to State of New Hampshire teacher certification in music, grades K-12 (cert. #612.13). New Hampshire also participates in a reciprocal agreement with many other states, the Interstate Certification Compact.

Regarding ensemble requirements for music education students: Of the 8 credits in ensemble performance (MUSE 441-464) required during the course of study, it is expected that at least 4 credits will be from Concert Choir (MUSE 441), Orchestra (MUSE 450), Wind Symphony (MUSE 452), and/or Symphonic Band (MUSE 453). At least 1 credit of performance in a jazz ensemble (MUSE 460 or 464) and 1 credit of Marching Band (MUSE 454) are highly desirable. The music preteaching option is a part of the five-year undergraduate-graduate certification program (see Department of Education, page 32). The department also offers a four-year program leading to teacher certification, the bachelor of music in music education.

For all the options listed, but excluding the undifferentiated B.A. in music, a public performance is given during the senior year. For students in the music history option, this must be a half lecture or half lecture-recital; for those in performance study, a full recital; for students in the music theory option, a half lecture, half lecture-recital, or a half recital including at least one original composition; for those in the preteaching option, a half recital is required.

**Bachelor of Music Program**

The bachelor of music degree program is offered to students who wish to develop their talent in performance, composition, or music education to a high professional level. The program is recommended to those considering graduate study leading to the M.M. or D.M.A. degrees. The music education option is part of the undergraduate certification program (see the Department of Education).

To be admitted to the B.M. program, students must demonstrate a high degree of musical competence or significant creative ability during an audition or examination. Selection is made on the professional requirements appropriate to each option. Students must formally declare the B.M. as a degree program before the beginning of the sophomore year. Continuation into the upper level of the program is subject to review by the department faculty.

The following courses are required of all Bachelor of Music students:

**Theory I, Ear Training I, and Functional Piano I (MUSE 471-472, 473-474, 475-476)**; **Theory II, Ear Training II, and Functional Piano II (MUSE 571-572, 573-574, 575-576)**; **History and Literature of Music (MUSE 501-502)**; **Conducting (MUSE 731)**, and one Advanced Music History (MUSE 703-715). Students will be given the opportunity to test out of MUSE 475-476 and MUSE 575-576. Additional requirements, grouped by option, are shown below.
Bachelor of Music in Music Education
MUED 741, choral methods; MUED 745-751, techniques and methods of the primary instrumental families; MUED 765, instrumental methods; MUED 790-791, elementary and secondary music education; MUSI 732, conducting: one course from MUSI 771, counterpoint or MUSI 781 or 782, analysis: form and structure; MUSI 779, orchestration; EDUC 500, exploring teaching; MUSI 708, survey of opera; one course from MUSI 771, counterpoint or MUSI 781 or 782, analysis: form and structure; MUSI 736-764, inclusive (6 credits); ensemble study, MUSI 441-464, inclusive (8 credits), please refer to the paragraph about ensemble requirements for music education majors.

Bachelor of Music in Performance
Voice
MUSI 520-521, diction for singers; ITAL 401-402, GERM 401-402, or FREN 401-402 (8 credits); MUSI 755, vocal pedagogy; MUSI 741, choral methods; MUSI 713, the art song or MUSI 715, survey of opera; one course from MUSI 771, counterpoint or MUSI 781 or 782, analysis: form and structure; MUSI 545/745, performance study (25 credits); ensemble study, MUSI 441-442, 448 or 461 inclusive (8 credits). Group 5 general education requirement must be fulfilled with an intermediate level foreign language.

Piano
Two courses from MUSI 771, counterpoint; MUSI 781 or 782, analysis: form and structure; MUSI 743, piano methods; MUSI 795E, piano ensemble (4 credits) and MUSI 441-464 inclusive (8 credits). Group 5 general education requirement must be fulfilled with an intermediate level foreign language.

All Other Instruments
One course from MUSI 771, counterpoint or MUSI 781 or 782, analysis: form and structure; one methods class in the appropriate instrumental family, MUSI 745-751 (2 or 3 credits); one additional 700-level advanced music theory or one additional advanced music history; MUSI 703-715; performance study, MUSI 545/745, performance study (25 credits); MUSI 455, piano ensemble (4 credits) and MUSI 441-464 inclusive (4 credits). Group 5 general education requirement must be fulfilled with an intermediate level foreign language.

Bachelor in Music Theory
GERM 401-402; MUSI 771-772, counterpoint; MUSI 781-782, analysis: form and structure; MUSI 775-776, composition; MUSI 777, advanced composition (6 credits); MUSI 779, orchestration; one additional 700-level advanced music theory class; one additional advanced music history, MUSI 703-715; performance study, MUSI 545/564/741/764 inclusive (25 credits); ensemble study, MUSI 448-460 and MUSI 463-464 inclusive (12 credits).

Minor in Music
All students minoring in music must complete a minimum of 20 credits of coursework in music, of which the following are required: MUSI 471-474 or MUSI 411-412; and MUSI 501-502, or MUSI 401 or 402 and 511.

Career Opportunities
Philosophy offers excellent training for a variety of careers by providing a unique combination of life-long skills: analytic and interpretive skills, critical reasoning skills, the enhanced capacity to detect problems and to solve them, excellence in oral and written presentation and defense of one's ideas, skill at asking probing and central questions about the ideas of others (as well as about one's own ideas), skill at effectively understanding, organizing, and evaluating complex systems of thought.

Considering these skills, it is not surprising that philosophy majors score in the very top percentiles on the GRE, LSAT, and GMAT standardized exams. For example, in a recent GRE study, philosophy majors were ranked among the very top majors in their mean scores on the verbal, analytic, and quantitative components of the exam; in a recent LSAT study, philosophy majors had a higher mean score than even pre-law majors; and for recent GMAT tests, the mean score for philosophy majors exceeded that of any type of business major. Virtually no other major does this well on such a wide cross-section of standardized exams.

These results reflect the fact that the unique combination of skills acquired in philosophy, along with the breadth of subject matter reflected on, provide the philosophy major with an extremely adaptive and resilient mind-set. Philosophy provides superior preparation for a variety of vocational and professional endeavors, and perhaps more importantly, for being a professional.

The Philosophy Major
Majors must take a total of ten philosophy courses. The following courses constitute a core required of all majors: PHIL 412, 500, 530, 570, 580, and one additional course in the history of philosophy (525, 571, 616, 618, 620, or an approved seminar). Majors must also take two seminars (i.e., courses at the 700 level). At least one course must concentrate on major works of 20th-Century European philosophy (525, 620, or an approved seminar) and one course must concentrate on major works of 20th-Century Anglo-American philosophy (618 or an approved seminar). Please note that a single course can satisfy multiple requirements for the major. Courses used to satisfy requirements for the major may be used to satisfy general education requirements. PHIL 495, 795, and 796 normally do not count toward fulfilling major requirement credits; exceptions may be granted by special permission.
Special-Interest Program

Students may add to the above major a special-interest program of value in planning for postgraduate education or entry into such areas as law, medicine, business, education, theology, or social work. Special advisers are prepared to provide informal counsel to philosophy majors interested in these areas.

Graduate Preparatory Emphasis

This emphasis is strongly recommended for students who plan to do graduate work in philosophy. Beyond the ten program courses, such students should select, with their advisers’ approval, two additional philosophy courses above the 400 level, for a total of twelve courses. One of these should be PHIL 550.

Distinction on Senior Thesis

Distinction on Senior Thesis is granted by a unanimous determination of the student’s committee that the thesis exceeds A level work and is worthy of special recognition.

Honors in Philosophy

To receive Honors in Philosophy a student will be expected to pursue a philosophy curriculum that demands greater depth and rigor than required by the major; they will be expected to complete the curriculum at a consistently high level of achievement; they will be expected to engage in independent study and research (under the supervision of a faculty member) beyond the requirements of their course-work; and they will be expected to present and defend a culminating project that synthesizes aspects of their study. Students can demonstrate these expectations in either of two ways: a thesis option or a portfolio option. Consult the Philosophy Department website for more details.

Philosophy Minor

A philosophy minor consists of five philosophy courses, one of which must be at the 500-level or higher (PHIL 495, 795, 796 with special approval only).

Political Science (POLT)

www.unh.edu/political-science/

(For course descriptions, see page 230.)

Chairperson: Warren R. Brown

Professors: Marla A. Brettschneider, Melvin Dubnick, Marilyn Hoskin

Associate Professors: Warren R. Brown, John R. Kayser, Aline M. Kuntz, Lawrence C. Reardon, Susan J. Siggelakas, Stacy D. Vandeveer, Clifford J. Wirth

Assistant Professors: Roslyn Chavda, Alyynna J. Lyon, Mary Malone, Jeannie Sowers

Lecturers: Tama Andrews, Kamal Chavda, Lionel R. Ingram

The study of government and politics, to which the courses and seminars of the Department of Political Science are devoted, includes the development of knowledge of political behavior by individuals and groups as well as knowledge about governments: their nature and functions; their problems and behavior; and their interactions at the national and international levels and at the local, state, and regional levels.

Much of the learning offered by the Department of Political Science can also be regarded as essential for good citizenship, since political knowledge helps to explain the formal and informal institutions by which we are governed and the forces which lead to policy decisions, and also seeks to clarify the issues and principles that encourage people toward political involvement. It contributes to the store of knowledge necessary for informed citizenship.

In addition, such learning is especially valuable to students planning to enter local or national government or other public service, including the Foreign Service, and it will be of great help to those who intend to study law and enter the legal profession. For teaching, particularly at the college level, and for many types of government service, graduate work may be indispensable. An undergraduate major in political science will provide a helpful foundation for any further study of politics and related fields in the social sciences and humanities. Such an emphasis will also be valuable for students seeking careers in journalism, international organizations, and the public affairs and administrative aspects of labor, financial, and business organizations.

The major program in political science consists of at least ten courses (40 credits) and not more than twelve courses (48 credits). The minimum grade requirement is C-per course. Any grade lower than a C-will not count toward the major. Courses are to be distributed in the following way:

1. Three 400-level courses. Once they declare the major, students must complete these three introductory courses within the first calendar year.

2. Six 500- and/or 600-level courses. Of these, at least one shall be chosen from each of the four fields in which the department’s courses are organized: American politics, political thought, comparative politics, and international politics.

3. One 700-level course. The Department of Political Science will allow the use of one 400-level course (401, 402, 403) to “double count” as a major requirement and a general education requirement.

Minor in Political Science

The political science minor consists of five courses (20 credits total). These courses may be taken in any combination of the four fields and levels (400-700) offered. The fields to choose from are: American politics, political thought, comparative politics, and international politics. No more than two courses can be taken at the 400 level.

The minimum grade requirement is C-per course. Any grade lower than a C-will not count toward the minor. Students wishing to use transfer credits from abroad or other universities should meet with a political science adviser to determine eligibility toward the minor.

Internships and Advanced Study

In addition to the courses regularly offered, the department will have available selected topics, advanced study in political science, and internships. Interested students should check with the department office to learn of the offerings for a given semester.

The department also offers several internship opportunities giving students experience in various aspects of government, policy making, and the legal system at the local, state, and national levels. Students need not be political science majors, but a student must have taken certain course prerequisites for each kind of internship. In addition, students must have junior or senior standing and normally have a 3.2 average or higher to be eligible for consideration. Washington placements are made either through the Department of Political Science or through the Washington Center located in the National Student Exchange Office in Hood House; major credit must be arranged through the department.

Portuguese (PORT)

www.unh.edu/languages/LLC/index.htm

(For program description, see Languages, Literatures, and Cultures, page 39. For course listings, see page 233.)

Psychology (PSYC)

www.unh.edu/psychology/

(For course descriptions, see page 233.)

Chairperson: Kenneth Fuld


Associate Professors: Victoria L. Banyard, Robert C. Drugan, Michelle D. Leichtman, John E. Limber, Carolyn J. Mebert, William Wren Stine, Daniel C. Williams
The psychology major provides students with a broad education, while also allowing some specialization. The program exposes students to the scientific study of behavior and encourages an increased understanding of the behavior of humans and animals.

Students who wish to declare psychology as a major after enrolling in the University should consult with the department's academic counselor for application procedures and criteria.

Students majoring in psychology must complete 44 credits with a minimum grade of C- in each course and a 2.00 overall average in all major requirements. The psychology department does not accept other departments' statistics courses toward the psychology major. Students who have taken a statistics course other than PSYC 402 must pass the psychology department's statistics courses toward the psychology major. Students who have taken a statistics course other than PSYC 402 must pass the psychology department's statistics courses toward the psychology major. The distribution of these credits will be determined by the department's academic counselor. Transfer students must earn a total of 44 approved credits for completion of the psychology major. The distribution of these credits will be determined by the department's academic counselor. Transfer students must earn a total of 44 approved credits for completion of the psychology major. Transfer students should note that courses are allotted only the number of credits granted by the original institution (after adjustments for semester-hour equivalents). Thus, students transferring from an institution at which courses carry less than 4 credits each must make up for any credit deficit created by acceptance of transfer credits into the psychology major. Of the four 700-level courses required for the major, at least three must be taken at UNH.

Specific course selections should be discussed with advisers. Exceptions to the requirements for the major require a petition to the department.

Psychology majors planning to go on to graduate study in psychology are advised to include PSYC 702 and/or 705 among their courses. The minor in psychology consists of five psychology department courses (20 credits), including PSYC 401. No more than 4 credits of PSYC 795 may be applied to the minor. A maximum of 9 approved psychology transfer credits can be applied to the UNH psychology minor.

The minor in psychology consists of five psychology department courses (20 credits), including PSYC 401. No more than 4 credits of PSYC 795 may be applied to the minor. A maximum of 9 approved psychology transfer credits can be applied to the UNH psychology minor.

See the department student services assistant for further details on the major or minor in psychology.

Advising System
Students who enter the University as psychology majors are considered "provisional majors" and are advised in the University Advising Center until they complete PSYC 401 and 402, at which time they can confirm their major. "Provisional majors" are accorded all the rights and privileges of any psychology major. Undergraduate advising in the department is conducted jointly by the department's academic counselor and the full-time faculty. The academic counselor has primary responsibility for advising confirmed and newly declared freshman and sophomore psychology majors and is the initial contact for all majors in a state of transition (readmitted, transfer, newly declared students, etc.). The academic counselor assists students in all phases of educational planning and decision making, including preregistration, long-range academic planning, degree and program requirements, and career selection and planning. Junior and senior psychology majors are assigned to a faculty adviser with appropriate consideration for student preferences. The advising relationship with a faculty member is designed to encourage refining career and educational decisions.

Undergraduate Awards for Majors
Each year the faculty chooses psychology undergraduates as the recipients of the following awards: the Herbert A. Carroll Award for an outstanding senior in psychology, the George M. Haslerud Award for an outstanding junior in psychology, and the Fuller Foundation Scholarship for an outstanding junior in psychology with demonstrated interests in clinical psychology. Psychology majors with at least a 3.20 grade-point average are eligible for these awards. Faculty nominate students from the eligibility list and final selection of recipients is made by vote of the full-time psychology faculty.

Honors Program in Psychology
The Department of Psychology sponsors an honors program for outstanding students in the major. Students may apply to the honors program in psychology in their sophomore or junior year.

Eligibility criteria include
1. Overall grade-point average of 3.20 or above and 3.4 in major courses
2. Completion of PSYC 401, 402, and 502 with a grade of B or above in each

Requirements of the program include
1. Three 700-level psychology honors courses or equivalent
2. PSYC 797, Senior Honors Tutorial (fall)
3. PSYC 799, Senior Honors Thesis (spring)

Students interested in applying to the honors program should contact the department's academic counselor.
The Department of Psychology sponsors the annual George M. Haslerud Undergraduate Research Conference each spring. Undergraduates are invited to submit empirical or theoretical papers for presentation at the conference. Contact the department's academic counselor for more information.

Russian (RUSS)
www.unh.edu/languages/LLC/Russian/index.htm
(For program description, see Languages, Literatures, and Cultures, page 39. For course descriptions, see page 237.)

Sociology (SOC)
www.unh.edu/sociology/
(For course descriptions, see page 239.)
Chairperson: James Tucker
Professors: Michele Dillon, Cynthia M. Duncan, David Finkelhor, Lawrence C. Hamilton, Murray A. Straus, Heather A. Turner, Sally Ward
Clinical Professor: John T. Kirkpatrick
Associate Professors: Linda M. Blum, Benjamin C. Brown, Sharyn J. Potter, James Tucker
Research Associate Professor: Glenda Kaufman Kantor
Assistant Professors: Cesar Rebellon, Thomas G. Safford, Karen Van Gundy
Research Assistant Professor: Wendy A. Walsh
Lecturers: Jean Elson, Priscilla S. Reintertsen

Sociology is the study of social life, social change, and the social causes and consequences of human behavior. Sociologists investigate the structure of groups, organizations, and societies, and how people interact within these contexts.

Since human behavior is shaped by social factors, the subject matter of sociology ranges from the intimate family to the hostile mob; from organized crime to religious cults; from the divisions of race, gender, and social class to the shared beliefs of a common culture.

Majoring in sociology provides a solid, multifaceted foundation in the liberal arts, including analytical thinking and writing, and skills in collecting and analyzing data. Students learn diverse theoretical approaches to the social world and acquire tools for conducting and understanding social science research. The wide range of substantive areas taught in the UNH sociology department includes courses concentrating on family and work; environmental sociology; social policy; inequalities of race, class, and gender; criminology, social control, and deviant behavior; medical sociology; and religion.

Undergraduate training in sociology is an excellent background for a variety of careers, including the business world, where majors might work in marketing and sales or human resources, or government or private services, where a major might work in education, health services, social welfare, criminal justice, or research. An undergraduate degree in sociology is also excellent preparation for graduate work in law, social work, counseling, public administration, public health, business administration, urban planning or further studies in sociology.

To declare a major in sociology, students must have completed at least one introductory level sociology course with a grade of C or better. New students who declare the major upon admission to UNH must enroll in sociology 400 during their first semester and earn a grade of C to maintain status in the program.

Majors must complete a minimum of 40 semester credits in sociology courses with a GPA of 2.00 or better in sociology courses. Soc 400, 502, 599, 601, and 611 are required; majors must take 599 no later than their junior year. At least two of the additional major courses must be at the 600 or 700 level. Students can count SOC 595 toward the fulfillment of one of their lower level (500 level) electives. SOC 502 (Statistics) may not be used by sociology majors for General Education requirement Category 2 (Quantitative Reasoning). Statistical courses in other disciplines are generally acceptable as a substitute for SOC 502.

Conjoint minors (allowing double-counting of one or two courses) are available for justice studies; gerontology; American studies; race, culture, and power; women's studies; and other approved minors. Students also have the opportunity to pursue a second major including Justice Studies. Students interested in social work or teaching can develop programs in conjunction with the appropriate departments. The departmental honors program is recommended for students with cumulative grade-point averages over 3.20, and especially for those anticipating graduate study.

Students interested in majoring in sociology should consult with the chair of the undergraduate committee in the sociology department for guidance. It is the responsibility of all sociology majors to obtain the latest information from the department office. A minor consists of any five 4-credit courses in sociology with a C- or better in each course and a grade-point average of 2.00 or better in these courses.

Sociology Language Requirement
The Bachelor of Arts Degree at the University of New Hampshire requires that a student satisfy the foreign language proficiency requirement. The requirement may be met by demonstrating language proficiency equal to a one-year college-level course (401 and 402, 501, or 503 and above in spoken language).

The Department of Sociology requires all students declaring the major after August 28, 2006, to choose from one of the following languages: Arabic, Chinese, French, German, Greek, Italian, Japanese, Latin, Portuguese, Russian, and Spanish.

Exceptions to this list must be petitioned and approved by the Department of Sociology’s Undergraduate Committee and a student's advisor.

Spanish (SPAN)
www.unh.edu/languages/LLC/index.htm
(For course descriptions, see page 241.)

Theatre and Dance (THDA)
www.unh.edu/theatre-dance/
(For course descriptions, see page 243.)
Chairperson: Deborah A. Kinghorn
Professors: David M. Richman, Charles L. Robertson
Associate Professors: Joan W. Churchill, David J. Kaye, Deborah A. Kinghorn, H. Gay Nardone, David L. Ramsey
Assistant Professor: Raina S. Ames
Lecturers: Carol J. Fisher, Sarah Jane Marschner, Daniel J. Raymond

The Department of Theatre and Dance has one of the largest and most varied undergraduate theatre programs in the Northeast, with concentrations in acting, musical theatre, design and technical theatre, dance, secondary education, youth drama, and youth drama for special education. Performance opportunities include six mainstage faculty-directed productions, three touring productions, and over 20 student-directed productions including plays, musical theatre, dance, puppetry, improvisation, comedy, and creative drama.

The award-winning faculty provides theatre majors with superlative training within a broad liberal arts context. Students may take courses in acting, voice and movement, dialects, directing, choreography, design and technical theatre, the history, theory and criticism of drama and theatre, youth drama, secondary school certification, youth drama in special education, playwriting, storytelling, puppetry, ballet, theater dance (jazz and tap), aerial dance, musical theatre, and touring
The minimum grade requirement is C- per course. Any grade lower than a C- will not enroll in a department, until they are assigned advisers. Students meet with the chair of the department, until they are assigned advisers appropriate to the individual’s area of interest. The minimum grade requirement is C- per course. Any grade lower than a C- will not count toward the major. Under department policy, students who complete both COMM 533 and 733 satisfy the language competency requirement. All UNH B.A. degrees require a minimum of 128 credit hours. Within those 128 credit hours, the theatre major offers seven specific course sequences:

**Theatre (B.A.)**

### General Theatre

**I. 22 credits required**

THDA 435, Introduction to Theatre; 436 or 438, History of Theatre I or II; 459, Stagecraft; 551, Acting I; 689 A-D, Theatre/Dance Practicum; 798 or 799, Senior Thesis or Capstone Project

**II. 4 credits from theory/history**

THDA 436 or 438, History of Theatre I or II; 450, History of Musical Theatre in America; 520, Creative Drama; 541, Arts and Theatre Administration; 632, Interpretation of Shakespeare in the Theatre; 638, American Theatre 1920-1970; 656, Musical Theatre Repertoire and audition; 657, Play Reading; 721, Education Through Dramatization; 727, Methods of Teaching Theatre; 750, Writing for Performance; 762, Women in 20th and 21st Century American Theatre

**III. 4 credits from design/technical**

THDA 458, Costume Construction; 475, Stage Make-Up; 532, The London Experience; 546, Costume Design for the Theatre; 547, Stage Properties; 548, Stage Lighting Design and Execution; 583, Introduction to Puppetry; 641, Stage Management; 650, Scene Painting for the Theatre; 651, Rendering for Theatre; 652, Scene Design; 683, Advanced Puppetry

**IV. 4 credits from performance**

THDA 470, Movement and Vocal Production; 552, Acting II; 555, Exploring Musical Theatre; 592A, Special Topics; 622, Storytelling, Story Theatre, and Involvement Dramatics; 624A, Theatre for Young Audiences-Acting; 624B, Theatre for Young Audiences-Directing; 628, Theatre for Young Audiences-Designing; 679, Theatre/Dance Practicum A-D; 721, Education Through Dramatization; 727, Methods of Teaching Theatre (must be taken before student internship); 729, Community-Oriented Drama Programs; 720, History and Play Analysis for Teachers; 799, Capstone Project

**V. 8 credits from any 600-800 level course, including**

**those in sections II, III, IV**

THDA 691, Internship in Theatre and Dance; 781, Theatre Workshop for Teachers; 782, Advanced Theatre Workshop for Teachers; 791, Internship in Theatre and Dance; 795, Independent Study; 798, Senior Thesis; 799, Capstone Project

**Total: 42 cr.**

Contact Deborah Kinghorn, Paul Creative Arts, (603) 862-1963, e-mail deb.kinghorn@unh.edu.

### The Secondary Theatre Education Emphasis

High school theatre teachers are often responsible for directing plays and musicals (the latter in collaboration with a music teacher). This is an extensive training program for secondary education theatre teachers meant to fully prepare students for the rigorous task of high school teaching.

**Theatre (B.A.)**

### Emphasis in Secondary Theatre Education

**I. 54 credits from theatre area**

THDA 435, Introduction to Theatre; 436 or 438, History of Theatre I or II; 459, Stagecraft; 463 Theatre Dance I; 551, Acting I; 555, Exploring Musical Theatre; 624A, Theatre for Young Audiences-Acting; 624B, Theatre for Young Audiences-Directing; 689, Theatre/Dance Practicum A-D; 721, Education Through Dramatization; 727, Methods of Teaching Theatre (must be taken before student internship); 729, Community-Oriented Drama Programs; 760, History and Play Analysis for Teachers; 799, Capstone Project

**II. 4 credits from design/technical area**

THDA 458, Costume Construction; 475, Stage Lighting Design and Execution; 782, Set, Lighting, and Costume Design

**III. 20 credits from education**

EDUC 500/605, Exploring Teaching; EDUC 701/801, Human Development and Learning; EDUC 705/805, Alternative Perspectives on the Nature of Education

**Total: 78 cr.**

### THDA Electives

Students should take at least 12 credits from the following courses:

THDA 436 or 438, History of Theatre I or II; 450, History of Musical Theatre in America; 475, Stage Make-Up; 520, Creative Drama; 547, Stage Properties; 583, Introduction to Puppetry; 622, Storytelling, Story Theatre, and Involvement Dramatics; 641, Stage Management; 650, Scene Design; 653, Performance Project or 654, Scenic Arts Project; 683, Advanced Puppetry; 727, Methods of Teaching Theatre (Musical Theatre); 750, Writing for Performance; 762, Women in 20th and 21st Century American Theatre.

**NOTE:** It is understood that students will fulfill 20 internship contact hours with theatre students in their emphasis area: elementary, middle, or high school. Projects for 653A and 729 cannot count as internship hours. Students may fulfill this requirement through a variety of teaching opportunities with the TRY program (both during the school year and in the summer), or they may work with local schools teaching, coaching actors, assistant directing, choreographing, or in some other capacity as specifically arranged with the student’s theatre adviser. It is also understood that students involved in the above course curriculum in order to get state theatre arts certification must apply to either the UNH Department of Education or another university for acceptance into a five-year Master of Arts in Teaching (M.A.T.) or Masters of Education (M. Ed.) degree program which fulfills state requirements for certification.

Contact Raina Ames, Paul Creative Arts, (603) 862-3044, e-mail raina.ames@unh.edu.

*May be taken at the undergraduate level or the graduate level*


**The Youth Drama Emphasis**

Students considering a career in elementary education may be interested in an undergraduate specialization in youth drama. When coupled with a Master's Degree in Education (M.Ed.), the student is well equipped to succeed in the classroom. Many of the graduates of this particular program in theatre are presently employed as teachers of elementary school-aged children. The theatrical and practical experience they obtained as undergraduates prepared them to secure teaching positions and guaranteed success in the classroom. The energy, concentration, and immediacy of drama produce excellent results. The course sequence for the major option in Youth Drama is included here.

**Theatre (B.A.)**

Emphasis in Youth Drama

I. 38 credits required

THDA 435, Introduction to Theatre; 459, Stagecraft; 520, Creative Drama; 583, Introduction to Puppetry; 622, Storytelling, Story Theatre and Involvement Dramatics; 624A or 624B, Theatre for Young Audiences-Acting or Directing; 689 A-D, Theatre/Dance Practicum, 721, Education Through Dramatization; 729, Community Oriented Drama Programs; 799, Capstone Project

II. 4 credits from the dance area

THDA 463, Theatre Dance I

III. 8 credits in practicum (must be taken before internship)

EDUC 500/935, Exploring Teaching; EDUC 705/805, Alternative Perspectives on the Nature of Education

**IV. 20 credits from education**

EDUC 700/800, Educational Structure and Change; EDUC 701/801, Human Development and Learning; EDUC 703F/803F, Teaching Science; EDUC 703M/803M, Teaching Elementary Science and Social Studies; EDUC 706/806, Introduction to Reading Instruction (must be taken before internship); EDUC 751A/851A, Educating Exceptional Learners: Elementary (must be taken before internship)

**V. 4 credits from math education (must be taken before internship)**

MATH 601 or 602, Exploring Mathematics for Teachers I or II; MATH 621, Number Systems for Teachers; MATH 622, Geometry for Teachers; MATH 623, Topics In Mathematics for Teachers; MATH 703, Teaching of Mathematics, K-6; MATH 910, Teaching Elementary School Mathematics; EDUC 741/841, Exploring Mathematics with Young Children

Total: 70 cr.

**Youth Drama in Special Education**

Students considering a career in special education may be interested in an undergraduate specialization using youth drama as a methodology in their future classrooms. When coupled with a Master's Degree in Special Education, the student is well equipped to succeed in the classroom.

Students who want specific instruction in special/exceptional populations will be provided theoretical and practical training to prepare them to obtain teaching positions and to have classroom successes. The energy, concentration, and immediacy of drama produce excellent results. The course sequence for the education and/or theatre major option in youth drama in special education is included here.

**Theatre (B.A.)**

Emphasis in Youth Drama in Special Education

I. 38 credits required from theatre and dance

THDA 435, Introduction to Theatre; 459, Stagecraft; 463, Theatre Dance I; 520, Creative Drama; 583, Introduction to Puppetry; 622, Storytelling, Story Theatre and Involvement Dramatics; 624A or 624B, Theatre for Young Audiences-Acting or Directing; 689 A-D, Practicum; 721, Education Through Dramatization; 799, Capstone Project

II. 12 credits from education*

EDUC 706/806, Introduction to Reading Instruction; EDUC 750/850, Introduction to Exceptional Education; EDUC 751/851, Educating Exceptional Learners

III. 32 credits from math education

MATH 601 or 602, Exploring Mathematics for Teachers I or II; MATH 621, Number Systems for Teachers; MATH 622, Geometry for Teachers; EDUC 741/841, Exploring Mathematics for Young Children

IV. 44 credits from special education

EDUC 939, 940, SPED teaching/assessment classes; EDUC 900, 901C, Teaching Internship; EDUC 949, Supporting Families; EDUC 938, Advanced SPED Seminar; EDUC 981, Research Methods + 3 electives that afford graduate level credit.

Total 98 cr.

Additionally, students would be strongly encouraged to fulfill their Foreign Language requirement with American Sign Language.

Students may wish to contact the Department of Education to learn more about teacher certification and Master of Education (M.Ed.) that can be accomplished at UNH in special education.

Contact Raina Ames, Paul Creative Arts, (603) 862-3044, e-mail raina.ames@unh.edu.

**The Musical Theatre Emphasis**

A balanced program in Musical Theatre is offered as an emphasis within the Department of Theatre and Dance. This area of emphasis within the major focuses on dance, music, and theatre. It is assumed that students considering the Musical Theatre Emphasis will have a certain amount of proven ability in at least one of the "triple threat" disciplines. After four years of study it is hoped that the student will have a solid background in vocal techniques, and part singing (usually obtained through choral work). Students in the major are given vocal study awards to offset the cost of private lessons from a teacher of their choice.

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*May be taken at the undergraduate level or the graduate level*
Theatre (B.A.)

Emphasis in Musical Theatre

I. 20 credits required
THDA 435, Introduction to Theatre; 450, History of Musical Theatre in America; 459, Stagecraft; 653B, Performance Project/Musical Theatre; 689A-D, Practicum; 799, Capstone Project

II. 12 credits from 400-500 level courses listed below
THDA 470, Movement and Vocal Production; 551, Acting I; 552, Acting II; 555, Exploring Musical Theatre

III. 12 credits from 600-700 level courses listed below
THDA 655, Musical Theatre Styles; 656, Musical Theatre Repertoire & Audition; 755, Advanced Musical Theatre; 756, Producing and Directing the Musical

IV. 6 credits from dance
THDA 462, Ballet I; 463, Theatre Dance I; 562, Ballet II; 563, Theatre Dance II (may be repeated); 662, Ballet III; 663, Theatre Dance III (may be repeated)

V. 10 credits from specialty area
The student and the adviser will select courses in Music, Theatre and Dance appropriate to the needs of the student.
Total: 60 cr.

Contact Carol Lucha-Burns, Paul Creative Arts, (603) 862-3288, luchaburns@comcast.net.

The Acting Emphasis

The Acting Emphasis was created for students with an intense interest in acting and/or directing. The emphasis was designed to help develop all aspects of the actor and the director as both an interpretive and creative artist. This program gives students the rigorous training of a B.F.A. styled program while maintaining all the advantages of a fully rounded liberal education. Students in the acting emphasis program are expected to strive for excellence in all areas of the art and craft of acting, through highly challenging coursework, special workshops with guest artists and instructors, productions and performance-based projects.

Theatre (B.A.)

Emphasis in Design and Technical Theatre

I. 22 credits required
THDA 435, Introduction to Theatre; 436 or 438, History of Theatre I or II; 459, Stagecraft; 470, Movement and Vocal Production; 551, Acting I; 552, Acting II; 689 A-D, Practicum; 799, Capstone Project

II. 4 credits from theory/history
THDA 436 or 438, History of Theatre I or II; 450, History of Musical Theatre in America; 632, The Interpretation of Shakespeare in Theatre; 638, American Theatre, 1920-1970; 657, Play Reading; 750, Writing for Performance; 762, Women in 20th and 21st Century American Theatre

III. 4 credits from design/technical theatre
THDA 458, Costume Construction; 475, Stage Make-up; 541, Arts and Theatre Administration; 546, Costume Design for the Theatre; 547, Stage Properties; 548, Stage Lighting Design and Execution; 583, Introduction to Puppetry; 650, Stage Painting for the Theatre; 651, Rendering for the Theatre; 652, Scene Design

IV. 4 credits from musical theatre/dance
THDA 463, Theatre Dance I; 555, Exploring Musical Theatre or 655, Musical Theatre Styles

V. 8 credits from
THDA 462, Ballet I; 463, Theatre Dance I; 550, The Actor's Voice Through Text; 562, Ballet II; 563, Theatre Dance II; 653, Performance Project; 655, Musical Theatre Styles or 755, Advanced Musical Theatre; 741, Directing I; 742, Directing II
Total: 50 cr.

Contact Joan Churchill, Paul Creative Arts, (603) 862-4445; e-mail joan@cisunix.unh.edu.

Musical Theatre Minor

10 credits required
THDA 450, History of Musical Theatre in America; 555 or 655, Exploring Musical Theatre or Musical Theatre Styles; 653B, Performance Project/Musical Theatre

6 credits from dance
THDA 463, Theatre Dance I; 562, Theatre Dance II; 663, Theatre Dance III

4 credits from upper level musical theatre
THDA 655, Musical Theatre Styles; 656, Musical Theatre Repertoire & Audition; 755, Advanced Musical Theatre; 756, Producing and Directing the Musical

Total: 20 cr.

Contact Carol Lucha-Burns, Paul Creative Arts, (603) 862-3288, luchaburns@comcast.net.

Dance Minor

Up to 16 credits from
THDA 461, Modern Dance I; 462, Ballet I; 463, Theatre Dance I; 562, Ballet II; 563, Theatre Dance II; 576, Pointe; 597, Dance Theatre Performance; 662, Ballet III; 663, Theatre Dance III; 665, Aerial Dance

At least 4 credits from
THDA 487, The Dance; 586, Dance Pedagogy; 632, Choreography; 633, Dance Composition; 684, Special Topics

Total: 20 cr.

Contact Gay Nardone, Paul Creative Arts, (603) 862-1728, hgn@cisunix.unh.edu.

Youth Drama Minor

16 credits required from
THDA 520, Creative Drama; 583, Introduction to Puppetry; 622, Storytelling, Story Theatre, and Involvement Dramatics; 624A or 624B, Theatre for Young Audiences—Acting or Directing; 683, Advanced Puppetry

4 credits required from
THDA 621, Education through Dramatization; 653A, Performance Project; 653B, Performance Project/Musical Theatre; 795, Independent Study

Total 20 credits

Contact Raina Ames, Paul Creative Arts, (603) 862-3044, e-mail raina.ames@unh.edu.
Women's Studies (WS)  
www.unh.edu/womens-studies/  
(For course descriptions, see page 246.)

Coordinator, Women's Studies Program:  
Linda M. Blum  

Associate Professors:  
Linda M. Blum, Marla A. Brettschneider, Julia Rodriguez  

Research Associate Professor: Mary M. Moynihan  

Research Instructor: Jane Stapleton  
Assistant Professors: Carol B. Conaway, Julia E. Rodriguez  

Adjunct Professor: Mary M. Moynihan  

Core Faculty: Kristine M. Baber, Family Studies; Victoria L. Banyard, Psychology; Linda M. Blum, Sociology; Marla A. Brettschneider, Political Science; Carol B. Conaway, Communication; Melissa D. Deem, Communication; Diane P. Freedman, English; Robin Hackett, English; Marc W. Herold, Economics; Lori Hopkins, Languages, Literatures, & Cultures; Nancy Lukens, Languages, Literatures, & Cultures; Kathy Miriam, Philosophy; Janet L. Polasky, History; Mary E. Rhiel, Languages, Literatures, & Cultures; Juliette M. Rogers, Languages, Literatures, & Cultures; Jennifer D. Selwyn, History; Raelene Shippée- Rice, Nursing; Mara R. Witzling, Art and Art History  

Women's studies provides students with an understanding of the status of women in various cultures and historical eras. Students learn the use of gender as a category of analysis and increase their knowledge of women's contributions to many fields. Women's studies courses offer students critical perspectives on such basic questions of the social order as assumptions about gender roles and gender identity.  

A major or minor in women's studies prepares students for careers where the changing roles of women are having a perceptible impact. Women's studies graduates go on to law school and graduate school in a variety of disciplines. Some have taken positions with social change or family service agencies, while others have found work in such fields as communications, education, affirmative action, and personnel.

Women's Studies Major  
For the women's studies major, students must complete 40 credits of women's studies courses (or 32 in the case of a second major) with grades of C- (1.67) or better and an overall grade-point average of 2.00 or better. These courses must include the following three: 1) WS 401, Introduction to Women's Studies, normally taken at the beginning of the course sequence; 2) WS 632, Feminist Thought; and 3) a 700-level WS-designated course (for instance, WS 795, 796, 797, 798, or 799). Electives are chosen in consultation with a faculty adviser principally from other women's studies courses including WS 595 (Special Topics in Women's Studies) and cross-listed departmental offerings.  

Departmental offerings include the following regularly repeated cross-listed courses:

ARTS 487, Themes and Images in Art: Major Mythic Images of Women  
ARTS 690, Women Artists of the Nineteenth and Twentieth Centuries  
CMN 567, Images of Gender in the Media  
CMN 583, Gender and Expression  
ECON 698, Topics in Economics: Women in Economic Development  
EDUC 507, Mentoring Adolescents  
ENGL 585, Introduction to Women in Literature  
ENGL 685, Women's Literary Traditions  
ENGL 785, Major Women Writers  
FS 545, Family Relations  
FS 757, Race, Class, Gender, and Families  
GERM 520, Women in German Literature and Society  
GERM 524, Topics in German Film  
HIST 565, Women in Modern Europe  
HIST 566, Women in American History  
NURS 595, Women's Health  
PHIL 510, Philosophy and Women  
PSYC 711, Psychology in 20th Century Thought and Society  
SOC/ANTH 625, Female, Male, and Society  
SOC 630, Sociology of Gender  

Students may also select from other courses that are offered as special topics by the departments. In the past, such offerings have included the following: ANTH 697, Women in the Middle East; CMN 616, Women and Film; FREN 525, French Women: Subject and Object.  

Electives must show a balance between arts and humanities/social sciences and be distributed between upper (600 and 700) and lower (400 and 500) level courses; no more than four electives may be from the same department. No fewer than five courses should be taken at the upper level. Strongly recommended are a practicum or internship course and a course that focuses on women of color or cross-cultural perspectives.

Women's Studies Minor  
The minor consists of 20 credits of women's studies courses. These must include WS 401, Introduction to Women's Studies, and WS 798, Colloquium in Women's Studies, normally taken at the beginning and end of the course sequence, respectively. It may be possible to substitute WS 797, (Internship) for WS 798, (colloquium), but please discuss with a WS adviser. In between, students should select other women's studies courses or cross-listed courses from departmental offerings. (For a more complete description of the women's studies minor, see Interdisciplinary Programs, page 110.)  

Students who wish to major or minor in women's studies should consult with the coordinator, 203 Huddleston Hall, (603) 862-2194.
The College of Engineering and Physical Sciences provides an opportunity for students to achieve educational objectives appropriate to their interests in engineering, computer science, mathematics, the physical sciences, and the teaching of mathematics and physical sciences. The college offers an education in each of its primary disciplines leading to the bachelor of science, as well as bachelor of art degrees with majors in mathematics and each of the three physical sciences. All programs include an opportunity for study in the arts, humanities, and social sciences.

The key to an undergraduate program in the college is flexibility, with a strong emphasis on personal and individualized education. In addition to specific programs, a wide range of options is available. Special programs can be developed to meet the specific interests of individual students.

Degree Requirement
MATH 425 and 426 (Calculus I and II), or the equivalent in transfer credits or advanced placement approved by the Department of Mathematics and Statistics, are required by all departments of the college. The prerequisites for calculus are three years of college-preparatory mathematics, including a half-year of trigonometry. Before students can register for MATH 425, they are required to take the Mathematics Placement Test.

Mathematics Placement
First-year students arrive with a wide range of mathematical skills based on high school preparation. The college wants you to have a solid mathematics foundation, so that you will enjoy an enriched first-semester experience. We will assess your mathematics development during June Orientation and enroll you in the class that will allow you to continue that development. The initial entry course is Analysis and Applications of Functions (MATH 418). However, a placement evaluation will be given to allow a student to place out of MATH 418 into MATH 425 (Calculus I). If you have received AP credit for Calculus I and/or Calculus II, you may elect to accept those credits and continue with a math course at the next level.

Accreditation
The baccalaureate-level programs in chemical, civil, computer, electrical, environmental, and mechanical engineering are accredited by the Engineering Accreditation Commission of ABET, Inc. The baccalaureate-level program in computer science is accredited by the Computing Accreditation Commission of ABET, Inc. ABET contact information: 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone (410) 347-7700. The Department of Chemistry’s undergraduate bachelor of science program is approved by the American Chemical Society.

Tech Courses
The following courses are designed for students of the college and for other majors within the University. These courses are offered through and administered by the Dean’s Office.

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECH 400</td>
<td>Introduction to CEPS Programs</td>
<td>1 cr.</td>
</tr>
<tr>
<td>TECH 564</td>
<td>Fundamentals of CAD</td>
<td>3 cr.</td>
</tr>
<tr>
<td>TECH 583</td>
<td>Technology: Cultural Aspects</td>
<td>4 cr.</td>
</tr>
<tr>
<td>TECH 583H</td>
<td>Honors/Technology: Cultural Aspects</td>
<td>4 cr.</td>
</tr>
<tr>
<td>TECH 601</td>
<td>Fundamentals Examination Review Course</td>
<td>1 cr.</td>
</tr>
<tr>
<td>TECH 685</td>
<td>Budapest Program</td>
<td>20 cr.</td>
</tr>
<tr>
<td>TECH 696</td>
<td>Independent Study</td>
<td>1 to 4 cr.</td>
</tr>
<tr>
<td>TECH 797</td>
<td>Undergraduate Ocean Research Project</td>
<td>2 cr.</td>
</tr>
</tbody>
</table>

Degrees

Bachelor of Science
The programs leading to the bachelor of science degree, offered in each of the departments of the college, emphasize students’ preparation for a professional career and continuing or graduate education.

The degree requirements for the bachelor of science include the University general education requirements (page 16) and the specific departmental requirements for graduation. A minimum grade-point average of 2.00 must be achieved. Graduation credit requirements established by the departments range from 128 to 134. There are entrance requirements in some programs, and it is not possible to guarantee all change-of-major requests.

Bachelor of Arts
Programs leading to a bachelor of arts degree are offered in the departments of chemistry, earth sciences, mathematics, and physics. These programs provide a broad liberal education along with a major in one of these fields. See page 18 for requirements for the bachelor of arts degree.
The environmental engineering program is known as Bachelor of Science in Environmental Engineering. The environmental sciences program consists of two emphases: industrial processes (IP) and municipal processes (MP). See page 64.

**Bachelor of Science in Environmental Sciences**

The environmental sciences program is offered jointly with the College of Life Sciences and Agriculture and consists of three options: hydrology, soil and watershed sciences, and Agriculture. The college's interdisciplinary minors are: Environmental engineering, see page 66. Materials science, see page 69. Ocean engineering, see page 112. Oceanography, see page 113.

For requirements regarding minors, see page 19.

**Minors**

Interdisciplinary minors enable students to obtain experience in a specialized area and to retain identification with their major professional area. The college's interdisciplinary minors are:

- Environmental engineering, see page 66.
- Materials science, see page 69.
- Ocean engineering, see page 112.
- Oceanography, see page 113.

**Other Programs**

**Independent Study and Projects**

All departments within the college offer independent study and/or projects. The content of these courses varies based upon current scientific and technological needs and student and faculty interest.

Permission of the instructor and/or department chairperson is required. (See the course descriptions for the independent study and project courses and for specific requirements.) Students interested in working with a faculty member on a project or independent study should discuss this with their academic adviser.

**Special Provisions**

The requirement of a given course in any prescribed curriculum may be waived by the faculty of a student's college. The student's petition must be approved by his/her major adviser and the dean of the college. This power will usually be delegated by the faculty to the dean or to a committee. (Senate Rule 05.21(s): Waiver of Requirements in a Prescribed Curriculum.)

This rule offers students the opportunity to develop a somewhat individualized plan of study with intellectual incentives and opportunities in addition to those in a regular curriculum.

A student with senior status and a grade point average of 3.2 may petition to take a graduate course for undergraduate credit. In addition, upon the recommendation of the department chairperson, a superior student may be allowed to count credits from up to two 800-level courses toward both a bachelor's degree and a master's degree, provided that the student has been admitted to the master's program.

**Research Opportunities**

The talents and expertise of the faculty in all departments are reflected in the number of ongoing research projects. Undergraduate are included in many of these research projects with the intent that they discover and foster their creative talents. In funded research projects, students may have an opportunity to receive pay while learning.

A multiplicity of research programs is reflected in special facilities: Bioelectronics Laboratory, Fluid Mechanics Laboratory, Solid State Laboratory, Space Science Center, Wind Tunnel and Water Tunnel Facilities, Structural Biology Laboratory, X-ray Diffraction Laboratory, Data Visualization Laboratory, Nano-Manufacturing Laboratory, Chaos and Dynamic Systems Laboratory, Structural Engineering High Bay, Xeon Magnetic Resonance Imaging Laboratory, Jere A. Chase Ocean Engineering Laboratory, Water Treatment Technology Center, Recycled Materials Research Center, and Center for Contaminated Sediment Research.

Students have the opportunity to acquire applied experience by working with faculty members who undertake client-sponsored professional projects in technical and managerial areas for business and industry and for federal, state, and local governments.

**Study Abroad Programs**

**Hungary**

The College of Engineering and Physical Sciences provides its students with the opportunity to spend the fall semester of their junior year at the Budapest University of Technology and Economics (BME) in Budapest, Hungary. Courses at BME are taught in English and receive prior approval for degree credit. Students studying in Budapest, therefore, can graduate on schedule at UNH. A general education course on the language, geography, and culture of Hungary, taken at BME, is strongly suggested. The foreign student office at BME will appoint a Hungarian adviser for each student and will assist students in obtaining housing either in dormitories or apartments. For more information, visit the program’s Web site at www.ceps.unh.edu/academics/budapest/.

**Puerto Rico**

Students may spend one or two semesters at the University of Puerto Rico (UPR) at Mayaguez, the second largest of the three major campuses in the UPR system. While having the opportunity to learn in a Latin American environment, participants maintain their status as UNH students, pay UNH tuition, and will be able to graduate from UNH on schedule. The exchange is open to students and faculty members from all UNH majors. Since eighty percent of all courses at UPR are taught in Spanish, participants must be proficient in Spanish. Interested CEPS students should contact the National Student Exchange Office, Hood House.

**Scotland, Heriot-Watt University Exchange Program**

College of Engineering and Physical Sciences students are eligible to participate in a spring semester exchange with Heriot-Watt University in Edinburgh, Scotland. The current program is designed for civil and environmental engineering majors. For more information, contact Ray Cook at (603) 862-1411 or the Center for International Education, Hood House.

**Preparing for Teaching**

Students interested in mathematics education (elementary, middle/junior high, or secondary), chemistry and physics teaching, earth science teaching, or general science teaching should refer to the appropriate department for a description of the program requirements.

**Combined Programs of Study**

In addition to pursuing a single major, students may combine programs of study as follows:

- **Minors:** See University Academic Requirements, page 16; see also Degrees and Major Programs of Study and Departmental Programs of Study, in this section.

- **Second Majors:** See University Academic Requirements, page 19.
The curriculum prepares our students for productive careers in industry or government and provides a foundation for graduate studies. Our program emphasizes chemical engineering fundamentals while offering opportunities for focused study in energy, environmental, or bioengineering.

Traditional employment areas in the chemical process industries include industrial chemicals, petroleum and petrochemicals, plastics, pharmaceuticals, metals, textiles, and food. Chemical engineers are also working in increasing numbers in the areas of energy engineering, pollution abatement, and biochemical and biomedical engineering; in addition, they are employed by many government laboratories and agencies as well as private industries and institutions.

Graduates from the program have the ability to apply knowledge of mathematics, science, and engineering to identify, formulate, and solve chemical engineering problems as well as to design and conduct experiments safely and analyze and interpret data. They are prepared to pursue advanced studies in chemical engineering. Program graduates gain a sense of professional and ethical responsibility with the ability to apply environmental, safety, economic, and ethical criteria in the design of engineering processes. They learn to function in individual and group working environments, and learn skills in written and oral communication and the effective use of computers for engineering practice, including information search in the library and on the Internet. They also understand the need for lifelong learning and the significance of societal and global issues relevant to chemical engineering.

A minimum of 130 credits is required for graduation with the degree of bachelor of science in chemical engineering. There are nine electives in the chemical engineering curriculum. Five of these are for the general education requirements. The remaining four electives should consist of three chemical engineering electives and one additional technical elective.

Students are required to obtain a minimum 2.00 grade-point average in CHE 501-502 and in overall standing at the end of the sophomore year in order to continue in the major.

### Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 401, Freshman English</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Math 425-426, Calculus I and II</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 407, General Physics I</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 405, General Chemistry</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>CHE 410, Energy and Environment</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Electives (2)</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 683-684, Physical Chemistry I and II</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 685-686, Physical Chemistry Laboratory</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>MATH 527, Differential Equations</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>CS 410, Introduction to Scientific Programming</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 408, General Physics II</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>CHE 501-502, Introduction to Chemical Engineering I and II</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 651-652, Organic Chemistry</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 653, Organic Chemistry Laboratory</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>CHE 601, Fluid Mechanics and Unit Operations</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>CHE 602, Heat Transfer and Unit Operations</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>CHE 603, Applied Mathematics for Chemical Engineers</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>CHE 604, Chemical Engineering Thermodynamics</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>CHE 612, Chemical Engineering Laboratory I</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Electives (2)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16</td>
<td>17</td>
</tr>
</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 605, Mass Transfer and Stagewise Operations</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>CHE 606, Chemical Engineering Kinetics</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>CHE 608, Chemical Engineering Design</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>CHE 613, Chemical Engineering Laboratory II</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>CHE 752, Process Dynamics and Control</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Electives (4)</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
<td>16</td>
</tr>
</tbody>
</table>

### Bioengineering Option

Under this option, the required courses deal with the application of basic biological sciences and chemical engineering principles to the design and operation of large-scale bioprocesses for the production of high value medicinal products, food and beverage, pharmaceutical, biomedical, genetic engineering products, and health care products. The elective courses permit the student to study topics of special interest in more depth or gain a broader perspective in bioengineering or some closely related subjects such as biochemistry or biotechnology experience in manufacturing or research. Three courses are required, and a minimum of two additional courses of at least 3 credits each should be selected from the electives list. Students interested in the bioengineering option should declare their intention during the sophomore year to the department faculty.
**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 761, Biochemical Engineering</td>
<td>4</td>
</tr>
<tr>
<td>CHE 762, Biomedical Engineering</td>
<td>4</td>
</tr>
<tr>
<td>BTEC 220, Biotech Experience: Manufacturing* (NHMET, Pease)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

*BTEC 220 is cross-listed as MICR 651.

**Elective Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 695, Chemical Engineering Project</td>
<td>3-4</td>
</tr>
<tr>
<td>CHE 696, Independent Study</td>
<td>3-4</td>
</tr>
<tr>
<td>BIOL 404, Biotechnology and Society</td>
<td>4</td>
</tr>
<tr>
<td>BCHM 751, Principles in Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>BCHM 752, Principles in Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>BCHM 750, Physical Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>BTEC 210, Biotech Experience: Research* (NHMET, Pease)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6-8</strong></td>
</tr>
</tbody>
</table>

*BTEC 210 is cross-listed as MICR 655.

**Energy Option**

This option covers the major areas of current interest in the energy field. The required courses provide students with a general background knowledge of fossil fuels, nuclear power, solar energy, and other alternative energy resources. The elective courses will permit the student to study topics of special interest in more depth or gain a broader perspective on energy and some closely related subjects. Three courses are required, and a minimum of two additional courses of at least three credits each should be selected from the electives list. Students interested in the energy option should declare their intention during the sophomore year to the department faculty. They may consult with Stephen S. T. Fan.

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENE 709, Fundamentals of Air Pollution and Its Control</td>
<td>4</td>
</tr>
<tr>
<td>ENE 772, Physicochemical Processes for Water/Air</td>
<td>4</td>
</tr>
<tr>
<td>ENE 742, Solid and Hazardous Waste Engineering</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>

**Elective Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 695, Chemical Engineering Project</td>
<td>3-4</td>
</tr>
<tr>
<td>CHE 696, Independent Study</td>
<td>3-4</td>
</tr>
<tr>
<td>CHE 744, Corrosion</td>
<td>4</td>
</tr>
<tr>
<td>ENE 746, Bioenvironmental Engineering Design</td>
<td>3</td>
</tr>
<tr>
<td>ENE 749, Water Chemistry</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6-8</strong></td>
</tr>
</tbody>
</table>

**Chemistry (CHEM)**

[www.unh.edu/chemistry/](http://www.unh.edu/chemistry/)

*(For course descriptions, see page 159.)*


**Associate Professors:** Steven B. Levery, Roy P. Planalp

**Assistant Professor:** Margaret E. Greenslade

“Chemistry is everywhere. From agriculture to health care, chemistry extends life and improves its quality. From disposable diapers to space suits, chemistry provides new materials for clothing, shelter, and recreation. From computer chips to fiber optics, chemistry is the foundation of today’s high technology.” (American Chemical Society)

A study in chemistry is the pathway to multiple options. These options range from a career in education, law, forensics, medicine, biotechnology, environmental protection, technical sales, pharmaceutical research, semiconductors, and industrial chemical production. The potential is limitless. Students interested in pursuing chemistry as an undergraduate degree have three options available to them, which are based on their career plans. These are the bachelor of science degree; a bachelor of arts degree; and a bachelor of arts, chemistry and physics teaching degree. Since the required chemistry courses in each degree program are the same the first year, it is easy to change from one program to another.

In general, a first year student should register for the following courses, and this applies to all three programs: First Semester: Freshman Seminar, Chemistry 400; General Chemistry with lab, Chemistry 403; Calculus I, Mathematics 425; Second Semester: Freshman Seminar, Chemistry 400; General Chemistry with lab, Chemistry 404; Calculus II, Mathematics 426; Freshman English, English 401W.

**Requirements**

1. Satisfy general education requirements.
2. For specific course requirements, see the accompanying chart.

**Bachelor of Arts in Chemistry**

This curriculum offers students the opportunity to combine the chemistry major with other interests, for example, preprofessional programs, education, and business.

**Baccalaureate Degree Requirements**

<table>
<thead>
<tr>
<th>B.S.</th>
<th>B.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry Courses</td>
<td>Chemistries</td>
</tr>
<tr>
<td>CHEM 698, Seminar</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 400, General Chemistry</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 517, Quantitative Analysis</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 547 &amp; 549, Organic Chemistry</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 548 &amp; 550, Organic Chemistry</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 574, Introduction to Inorganic Chemistry</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 683 &amp; 685, Physical Chemistry</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 684 &amp; 686, Physical Chemistry</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 762 &amp; 763, Instrumental Methods of Chemical Analysis</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 698, Seminar</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 699, Thesis</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 755 &amp; 756, Advanced Organic Chemistry</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 774 &amp; 775, Advanced Inorganic Chemistry</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 776, Physical Chemistry</td>
<td>x</td>
</tr>
<tr>
<td>CHEM 708, Spectroscopic Investigations of Organic Molecules</td>
<td>x</td>
</tr>
</tbody>
</table>

**Other Requirements**

All majors: MATH 425 and 426, Calculus I and II.

B.A.s are required to take CHEM 408, Seminar; it also meets writing intensive requirements.

B.S. degree: PHYS 407-408, General Physics I and II; BCHM 658 or 751, Biochemistry; one chemistry-related courses.

B.A. degree, chemistry major: PHYS 407, General Physics I, or PHYS 401-402, Introduction to Physics I and II; two other CHEM courses, except 698, or two approved chemistry-related courses.

† Suggested courses: MATH 527, 528; PHYS 505; EE 620; BCHM 658, 751.
Bachelor of Arts, Chemistry and Physics Teaching

This major is designed for students who wish to teach chemistry and physics in secondary schools. The number of positions available for teaching chemistry or physics alone is limited, but many opportunities exist to teach both subjects on the secondary-school level. Chemistry and physics teaching majors will have good preparation for teaching these subjects and will have the necessary mathematics and education background.

Requirements
1. Satisfy general education requirements.
2. Satisfy the bachelor of arts degree requirements (see page 10).
3. Chemistry requirements: 400, Freshmen Seminar; 403-404, General Chemistry I; 517, Quantitative Analysis; 545, 546 or 547-548 and 549-550, Organic Chemistry; 683-684 and 685-686, Physical Chemistry I and II.
5. Math requirements: 425, Calculus I, and 426, Calculus II.
6. All education courses in the teacher preparation program (see page 32).

General Science Certification

Students majoring in animal sciences, biochemistry, biology, environmental conservation studies, environmental sciences, forestry, microbiology, plant biology, wildlife management, or zoology, may seek certification to teach science at the middle, junior, or high school level.

For further information, contact the coordinator of teacher education in the Department of Education and see page 32.

Civil Engineering (CIE)

www.unh.edu/civil-engineering/

(For course descriptions, see page 160.)

Chairperson: Jean Benoit


Research Professor: T. Taylor Eighmy

Associate Professors: Thomas L. Attard, Thomas P. Ballester, Raymond A. Cook, Charles H. Goodspeed, Robert M. Henry, Jennifer M. Jacobs

Research Associate Professor: Kevin H. Gardner

Assistant Professors: Erin S. Bell, Jo S. Daniel

Research Assistant Professors: Jenna R. Jambeck, Jeffrey S. Melton

Civil engineering involves the planning, design, and construction of public works: buildings, bridges, roads, dams, water transmission systems, water treatment systems, tunnels, and more. These facilities must provide efficient service, be cost-effective, and be compatible with the environment. Moreover, civil engineers work under a code of ethics in which their primary, overriding responsibility is to uphold the public's trust by working to plan, design, build, and restore safe and environmentally responsible public works.

Civil engineers work as private consultants and for government agencies in a wide variety of indoor and outdoor settings around the world. There is a strong and constant market for civil engineers due to the demands placed on the profession to construct, maintain, and repair the infrastructure (e.g., bridges, buildings, roads, water transmission lines, water treatment plants, and power plants).

As civil engineering is such a broad field, it is traditionally divided into several sub-disciplines. At the University of New Hampshire, five are offered: civil engineering materials, environmental engineering, geotechnical engineering, structural engineering, and water resources engineering. Civil engineering majors may choose the sub-discipline in which to focus their studies during their senior year. Additionally, the College of Engineering and Physical Sciences, through the Departments of Civil Engineering and Chemical engineering, offers a B.S. in environmental engineering (ENE) which is a major for students who choose to specifically focus their attention solely in that area. (Students who are interested in environmental engineering but who also want a broader or more traditional civil engineering focus should pursue the civil engineering major and elect environmental engineering courses in their senior year.)

Students may readily transfer between the civil engineering (CIE) and ENE programs within the first two semesters. Both the B.S. in civil engineering and the B.S. in environmental engineering provide a firm base in mathematics, science, and engineering and all majors are expected to develop excellent communication and computer skills. Graduates are prepared to enter the profession and to pursue advanced study. Because of the broad technical background attained, some graduates also successfully pursue further education in business, law, and medicine.

Mission

The mission of the Department of Civil Engineering is to pursue and disseminate knowledge through teaching, research, and public service. As part of its teaching mission, the department provides rigorous, yet flexible, undergraduate and graduate education for both traditional and nontraditional students through classical and creative instruction in the classroom, laboratory, and field. While preparing students for the profession, the department offers an education in civil engineering that includes working in multidisciplinary teams that critically analyze and formulate solutions to civil engineering problems and apply engineering principles that provide social, economic, and environmental benefits to the public. The department encourages in its students a lifelong desire to keep abreast of new developments in the field and teaches them the skills necessary to continue learning. As part of its research mission, the department maintains a rigorous multidisciplinary program of scholarship advancing the state of the art in civil engineering. As part of its mission in public service, the department enhances the quality of life for people, especially in New England and specifically New Hampshire, by providing expert services; advancing and transferring knowledge and technology; and serving as a resource for information.

Educational Objectives

In accordance with its University, college, and department missions, the faculty of the Department of Civil Engineering has established clear objectives for students to help them become successful professionals after graduation. To assist graduates to become practicing civil engineers, the program helps students achieve a basic competence in math, science, and engineering principles; learn how to apply this knowledge to solve engineering problems; achieve a working knowledge in the basic civil engineering areas of structural engineering, geotechnical engineering, civil engineering materials, water resources, environmental engineering, and project engineering; and extend their knowledge in one or more of these areas. As part of this process, students learn how to critically analyze and design equipment, structures, systems, or processes to meet desired needs; to use current, and be able to independently learn new, engineering software. Engineers also need to be effective communicators. Engineering students learn how to communicate and defend ideas in technical reports and correspondence; how to speak before a group and convey information to technical and non-technical audiences; and how to create and effectively use graphics in support of a presentation or report. Students also learn how to work effectively as good team players who are also capable of being members of multidisciplinary teams.
As part of finding engineering solutions, students learn to locate, compile, and use existing information; design and perform experiments to gather new information; critically analyze information; and draw conclusions. Due to the nature of civil engineering efforts which involve the public, public safety, and significant financing, it is imperative that graduates become good engineering citizens. Students develop an awareness of the interaction between engineering practice and social, economic, and environmental issues; the importance of the ASCE Code of Ethics; an awareness of contemporary issues in their interaction with civil engineering practice; and the importance of broadening their education by being familiar with topics outside of the math, science, and engineering areas. Civil engineers are also professionals who are often licensed practitioners. Students are prepared to take the Fundamentals of Engineering examination (which is required for professional licensure), understand the need for lifelong learning and actively participate in organizations such as ASCE, SWE, SWB, Tau Beta Pi, and the Order of the Engineer.

**Bachelor of Science in Civil Engineering**

Matriculating students should have strong aptitudes in mathematics and science along with imagination, spatial and graphic abilities, communication skills, and creativity. Students then follow a four-year program which conforms to the guidelines of, and is accredited by, the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone (410) 347-7700.

The first two years of the program provide the necessary technical knowledge in mathematics, chemistry, and physics, while introducing and developing civil engineering problem solving techniques. The junior year provides courses in each of the civil engineering sub-disciplines providing students with skills in each and allowing students to determine which they wish to pursue further. The senior year is flexible, allowing students to choose where to focus attention by selecting from more than thirty elective courses in civil and environmental engineering.

The required curriculum includes seven writing intensive courses thereby not only satisfying but exceeding the University's writing requirement. (See page 16.)

**Electives**

Approximately one third of the major's total credits and more than half of the senior-level courses are elected by the student. Of these, there are general education electives required by the University and other electives required by the department in order to satisfy departmental objectives and accreditation requirements.

1. The General Education Program is described in University Academic Requirements. Courses required by the civil engineering major fulfill the Group 1 through Group 3 general education requirements. Therefore, students select electives to satisfy the Group 4 through Group 8 courses-one elective per group.

2. The civil engineering major also requires students to select one math and basic sciences elective. A list of courses that fulfill this elective is available from the department.

3. Civil engineering majors wishing to participate in exchange programs must achieve a cumulative grade point average of 3.00 or better in all MATH, PHYS, CHEM, CIE, and ENE courses taken to date at the end of each of the second and third semesters prior to their exchange semester.

4. In the senior year, students take four courses specific to civil engineering sub-disciplines, and a senior science elective. Students can use these electives to focus on a particular civil engineering area or can acquire a broader perspective by taking courses in a variety of areas. At least one of these four elective courses must also qualify as a civil engineering design elective, and no more than three courses may be taken in one sub-discipline. Lists of courses that fulfill these electives are available from the department.

**Additional program policies and requirements**

1. CIE and ENE 600- and 700-level courses are intended for CIE and ENE majors only. All others may enroll in these courses only with the permission of the instructor and may take no more than 20 credits of these courses.

2. To enter the required 600-level courses in the junior year, students:
   a. must have completed CIE 525, CIE 526, MATH 425, PHYS 407, and CHEM 405 or CHEM 403,
   b. must have achieved an overall grade point average of 2.00 or greater for these courses, and
   c. must attain a grade of C or better in each of CIE 525 and CIE 526.

3. To transfer into the civil engineering major, a student must:
   a. have an overall grade point average of 2.30 or greater;
   b. have completed 16 credits or more of MATH, PHYS, CHEM, CIE, and ENE courses;
   c. have an overall grade point average of 2.00 or greater for all MATH, PHYS, CHEM, CIE, and ENEN courses taken to date; and
   d. have an overall grade point average of 2.50 or greater for 16 credits of the MATH, PHYS, and CHEM CIE, and ENE courses taken to date.

4. Students who are transferring into the civil engineering major may receive:
   a. a maximum of 20 credits for CIE and ENE 600- and 700-level coursework taken prior to the transfer, and
   b. credit only for CIE and ENE 600- and 700-level courses taken prior to the transfer in which the student has received a grade of C- or better.

5. To continue as a civil engineering major, a student may not:
   a. repeat more than two CIE or ENE courses,
   b. achieve a semester grade point average lower than 2.00 for each of three consecutive semesters, and
   c. achieve a cumulative grade point average of less than 2.00 for CIE and ENE courses in any three semesters.

6. To graduate with a bachelor of science in civil engineering, a student must:
   a. earn 129 or more credits,
   b. achieve credit for the civil engineering program's major and elective courses,
   c. satisfy the University's general education requirements,
   d. satisfy the University's writing intensive course requirements,
   e. earn a cumulative grade point average of 2.00 or better for all courses, and
   f. earn a cumulative grade point average of 2.00 or better for all CIE and ENE courses.

**First Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIE 402, Intro. to Civil Engineering</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>ENGL 401, First-Year Writing</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>TECH 564, Fundamentals of CAD</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Elective (2)</td>
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<td>4</td>
</tr>
<tr>
<td>CIE 505, Surveying and Mapping</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>MATH 425, Calculus I</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PHYS 407, General Physics I</td>
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**Sophomore Year**

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<tr>
<th>Course</th>
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<tr>
<td>CIE 525, Statics</td>
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<tr>
<td>ENE 520, Environmental Pollution</td>
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<td>-</td>
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<tr>
<td>ENGL 502, Technical Writing</td>
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<tr>
<td>MATH 426, Calculus II</td>
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<tr>
<td>PHYS 408, General Physics II</td>
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<tr>
<td>CHEM 405, General Chemistry</td>
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<td>4</td>
</tr>
<tr>
<td>CIE 526, Strength of Materials</td>
<td>-</td>
<td>3</td>
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<tr>
<td>CIE 533, Project Engineering</td>
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<tr>
<td>MATH 527, Differential Equations with Linear Algebra</td>
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<td><strong>Total</strong></td>
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**Junior Year**

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CIE 622, Engineering Materials</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>CIE 642, Fluid Mechanics</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>MATH 644, Statistics for Engineers and Scientists</td>
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</tr>
<tr>
<td>Elective (1)</td>
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<tr>
<td>MATH 665, Soil Mechanics</td>
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<tr>
<td>CIE 681, Classical Structural Analysis</td>
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<tr>
<td>ENE 645, Fundamental Aspects of Environmental Engineering</td>
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<td>Elective (1)</td>
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**Senior Year**

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<tr>
<th>Course</th>
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<tr>
<td>CIE 760, Foundation Design I</td>
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<tr>
<td>CIE 774, Reinforced Concrete Design</td>
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<td>-</td>
</tr>
<tr>
<td>CIE 784, Intro. to Project Planning and Design</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>
**Approved list available in the CIE office.**

Elective (1), senior science** 3
CIE or ENE 788, Project Planning and Design 3
Elective (2), civil engineering** 3 9
Elective (1), general education requirement* 4

**Total 15 16**

Computer Science (CS)
www.cs.unh.edu

*(For course descriptions, see page 166.)*

Chairperson: Philip J. Hatcher
Professors: R. Daniel Bergeron, Pilar de la Torre, Philip J. Hatcher, Ted M. Sparre, Colin Ware
Associate Professors: Radim Bartos, Michel Charpentier, Robert D. Russell, Elizabeth Variki, James L. Weiner
Affiliate Associate Professors: Jason H. Moore, Sylvia Weber Russell
Instructors: Michael Gildersleeve, Brian L. Johnson, Israel J. Yost
Lecturers: Mark L. Bochert, Ellen M. Hepp, Karen Hodge, Linda Kenney, Karl Shump

Computer scientists are concerned with all aspects of the design and implementation of computer software. They are concerned with problem solving in general, with particular emphasis on the design of computer-efficient solutions. This involves detailed understanding of the nature of algorithms (a set of rules for solving a problem), the software implementation techniques necessary to utilize algorithms on computers, and a knowledge of how algorithms can be combined in a structured manner to form highly complex software systems.

The broad objectives for the B.S. in computer science are to produce graduates who:

1. are competent in formulating and solving computer science problems including the development of non-trivial software systems;
2. understand computer science fundamentals along with supporting mathematics and science sufficiently well to be prepared for a wide range of jobs and to pursue advanced degrees;
3. are able to function in the workplace with the necessary technical skills and with appropriate oral and written communication skills; and
4. have a broad education that promotes professional advancement, lifelong personal development, and social responsibility.

Computer science majors must obtain an overall grade-point average of 2.00 or better in all required computer science, mathematics, and electrical engineering courses in order to graduate. If at the end of any semester, including the first, a student's cumulative average in these courses falls below 2.00, the student may not be allowed to continue as a CS major.

If a student wishing to transfer into the computer science major has taken any other coursework that is applicable to the major, the grades in those courses must satisfy the minimum requirements for the B.S. degree in computer science. The student must have an overall grade-point average of 2.00 or better in all courses taken at UNH.

**Bachelor of Science in Computer Science**

The standard program leads to a B.S. in computer science and is designed to prepare students for both employment and graduate study in the field. The program emphasizes the application of computer science theory and principles but also includes a broad background in basic mathematics and an introduction to computer hardware. Most courses require heavy use of the computer, and the laboratories stress hands-on experience with building software systems.

**Requirements**

1. Satisfy general education requirements. The following courses are required and may be used to fulfill requirements in the appropriate general education group: PHYS 407-408, General Physics I and II; MATH 425, Calculus I; and PHIL 424, Science, Technology and Society.
2. Two additional technology or science courses, one of which may satisfy a general education requirement, chosen from the following list:

**Biology**
BIOL 411, Principles of Biology I
BIOL 412, Principles of Biology II
BIOL 413, Principles of Biology I (a UNHM course)
BIOL 414, Principles of Biology II (a UNHM course)
HMP 501, Epidemiology and Community Medicine
MICR 501, Public Health Microbiology
PBIO 412, Introductory Botany
PBIO 421, Concepts of Plant Growth
ZOOL 412, Principles of Zoology

**Physical Science**
CHEM 401-402, Introduction to Chemistry
CHEM 403-404, General Chemistry
CHEM 405, General Chemistry
ESCI 405, Global Environmental Change
ESCI 409, Environmental Geology
ESCI 501, Introduction to Oceanography
NR 504, Freshwater Resources

**Technology**
PHIL 447, Computer Power and Human Reason

3. Two additional approved courses chosen from the humanities, social sciences, and arts. These courses are in addition to any courses used to satisfy general education requirements.
4. One core course, CS 415, Introduction to Computer Science I, which must be passed with a grade of B- or better.
5. Ten additional core courses, which must be passed with a grade of C- or better. Before taking a course having any of these ten courses as a prerequisite, the prerequisite course(s) must be passed with a grade of C- or better: CS 416, Introduction to Computer Science II; CS 515, Data Structures; CS 516, Introduction to Software Development and Design; CS 520, Assembly Language Programming and Machine Organization; CS 620, Operating System Fundamentals; CS 671, Programming Language Concepts and Features; MATH 425 and MATH 426, Calculus I and II; MATH 531, Mathematical Proof; MATH 532, Discrete Mathematics.
6. CS 595, Computer Science Seminar (two credits).
8. CS 719, Object-oriented Methodology.
9. Two approved computer science courses chosen from CS courses numbered above 640 or ECE 777, Collaboration Engineering, or ECE 649, Embedded Microcomputer Based Design.
10. One approved writing intensive course chosen from CS courses numbered above 640.
12. Two electrical and computer engineering courses: ECE 543, Introduction to Digital Systems, and ECE 562, Computer Organization.

**Bachelor of Science in Computer Science, Bioinformatics Option**

The aim of the bioinformatics option is to provide a tailored program for undergraduate students who wish to apply computer science expertise in the life sciences. The bioinformatics field is an increasingly important subdiscipline in computer science. The demand for computer science graduates who can apply their knowledge in the life sciences is large, and is expected to continue to grow.

The bioinformatics option has the same core as the B.S. program but requires the appropriate coursework in chemistry, biology, biochemistry and statistics. The bioinformatics option of the baccalaureate-level program in computer science is not yet accredited because it has not yet been through the entire review process.
The option requirements are:

1. Satisfy general education requirements. The following courses are required and may be used to fulfill requirements in the appropriate general education group: CHEM 403-404, General Chemistry; BIOL 411, Principles of Biology I; MATH 425, Calculus I; and PHIL 424, Science, Technology, and Society.

2. Three science courses: BIOL 412, Principles of Biology II; BIOL 604, Genetics; and BCHEM 711, Genomics and Bioinformatics.

3. Two approved courses chosen from the humanities, social sciences, and arts. These courses are in addition to any courses used to satisfy general education requirements.

4. One core course, CS 415, Introduction to Computer Science I, which must be passed with a grade of B- or better.

5. Ten additional core courses, which must all be passed with a grade of C- or better. Before taking a course having any of these ten courses as a prerequisite, the prerequisite course(s) must be passed with a grade of C- or better: CS 416, Introduction to Computer Science II; CS 515, Data Structures; CS 516, Introduction to Software Design and Development; CS 520, Assembly Language Programming and Machine Organization; CS 620, Operating System Fundamentals; CS 671, Programming Language Concepts and Features; MATH 425 and MATH 426, Calculus I and II; MATH 531, Mathematical Proof; MATH 532, Discrete Mathematics.

6. CS 595, Computer Science Seminar (two credits).


8. Two required senior-level courses: CS 719, Object-Oriented Methodology, and CS 775, Database Systems.

9. One additional senior-level course chosen from CS 730, Introduction to Artificial Intelligence; CS 767, Interactive Data Visualization; CS 770, Computer Graphics; or CS 696, Independent Study. The chosen course must include a project that addresses bioinformatics issues.

10. At least one of the three senior-level computer science courses must be writing intensive.

11. Two courses in probability and statistics: MATH 539, Introduction to Statistical Analysis or MATH 644, Probability and Statistics for Applications, and a follow-up course chosen from MATH 739, Applied Regression Analysis; MATH 742, Multivariate Statistical Methods; or MATH 755, Probability and Stochastic Processes with Applications.


The courses offered in the Department of Earth Sciences cover the broad spectrum of earth sciences, with emphases on geology, hydrology, geochemistry, and oceanography. The curriculum encompasses a group of related studies concerned with an understanding of the Earth and its environment. Study of the processes that shape the continents and oceans, drive the hydrologic cycle and ocean circulation, and affect climate change and the evolution of life is based on a foundation of basic mathematics, physics, and chemistry.

The need for people trained in the earth and environmental sciences has been increasing in response to society's growing concern with sound environmental and resource management, including the disposal of waste on land and in the atmosphere and oceans; the management of water resources; the development of energy and mineral resources; and the assessment of environmental hazards. In addition, the demand for well-trained secondary school teachers of earth sciences has been steadily increasing.

The Department of Earth Sciences offers five majors: B.S. geology, B.S. environmental sciences (interdisciplinary with the College of Life Sciences and Agriculture), B.A. earth sciences, B.A. earth sciences/oceanography, and B.A. earth science teaching. These programs prepare students for advanced study in the geosciences; for entry-level professional employment in public or private institutions concerned with environmental and resource management, including consulting firms, government agencies, energy- and resource-extraction firms, utilities, and nonprofit organizations; and for secondary-school teaching of earth sciences.

The Department of Earth Sciences also offers a minor in geology, as well as interdisciplinary minors in hydrology and oceanography.

Descriptions and requirements for the majors and minors are arranged alphabetically.

Bachelor of Arts in Earth Sciences

The bachelor of arts in earth sciences is offered through the Department of Earth Sciences. This program provides students an opportunity to obtain a broad education and a general background in the earth sciences with a greater degree of freedom in choosing electives than in the bachelor of science programs. By careful choice of electives, students can prepare for graduate school, business, or industry.

Requirements

1. Satisfy the general education requirements.

2. Satisfy the bachelor of arts degree requirements (page 18).

3. Complete a minimum of eight courses in the department (with a C- or better), including ESCI 401, Principles of Geology; or ESCI 409, Environmental Geology; ESCI 402, Earth History; ESCI 512, Principles of Mineralogy; and five upper-level courses, two of which must be 700 or above.

4. Math requirements: 425, Calculus I, and 426, Calculus II.

It is strongly advised that students complete, as early as possible, a year each of college chemistry and physics.

Bachelor of Arts in Earth Sciences, Oceanography Option

The bachelor of arts in earth sciences, oceanography option, is offered by the Department of Earth Sciences. This program provides students an opportunity to obtain a broad education and a general background in the earth sciences, as well as the flexibility to choose electives in the area of oceanography. A clear, comprehensive understanding of the ocean environment will prepare students for graduate school or for employment opportunities available on our coasts in ocean-related fields such as aquaculture, fishing, tourism, environmental protection, shipping, construction, government regulation, and education.

Requirements

1. Satisfy the general education requirements.

2. Satisfy the bachelor of arts degree requirements (page 18).

3. Complete a minimum of eight courses in the department (with a C- or better) including ESCI 401, Principles of Geology, or ESCI 409, Environmental Geology, ESCI 402, Earth History or 200L, 503, Introduction to Marine Biology, ESCI 501, Introduction to Oceanography; ESCI 512, Principles of Mineralogy; and four upper-level ocean related courses, two of which must be 700 or above. Typically these would be chosen from ESCI 658, Earth, Ocean, and Atmosphere Dynamics; ESCI 750, Biological Oceanography; ESCI 752, Chemical Oceanography; ESCI 756, Physical Oceanography; and ESCI 759, Geological Oceanography.

4. Math requirements: 425, Calculus I, and 426, Calculus II.
It is strongly advised that students complete, as early as possible, a year each of college chemistry and physics.

Oceanography Minor
See page 113.

Bachelor of Arts in Earth Science Teaching
The bachelor of arts in earth science teaching program is offered by the Department of Earth Sciences in coordination with the Department of Education. The program is specifically designed to prepare students to teach earth sciences in secondary school. Upon graduation from this program, students are prepared to complete a Masters degree in Education with an additional year of graduate study, which includes a year long internship (EDUC 900/901). After completing this typically five-year program, students receive full teacher certification, which is recognized in most states.

Requirements
1. Satisfy the general education requirements.
2. Satisfy the bachelor of arts degree requirements (page 18).
3. Complete the following: ESCI 401, Principles of Geology, or ESCI 409, Environmental Geology; ESCI 402, Earth History; ESCI 501, Introduction to Oceanography; GEOG 473, The Weather; CHEM 403-404, General Chemistry; PHYS 401-402, Introduction to Physics I and II, PHYS 406, Introduction to Modern Astronomy; plus 12 approved elective credits from intermediate and/or advanced earth sciences courses.
4. Math requirements: 425, Calculus I, and 426, Calculus II.
5. Satisfy the secondary-school teacher education program (see page 32).

General Science Certification
Students majoring in animal sciences, biochemistry, biology, environmental conservation studies, environmental sciences, forestry, microbiology, plant biology, wildlife management, or zoology, may seek certification to teach science at the middle, junior, or high school level.

For further information, contact the coordinator of teacher education in the Department of Education.

Bachelor of Science in Geology
The bachelor of science in geology is offered through the Department of Earth Sciences. The program represents a strong concentration in the earth sciences and is especially well suited for students who plan to continue their studies in graduate school. Beyond a central core of courses, there is sufficient flexibility in course selection so that students may, in consultation with their academic advisers, orient the program toward a particular facet of the earth sciences (e.g., mineralogy-petrology, oceanography, hydrogeology, geophysics-structural geology, geomorphology-glacial geology, geochemistry, paleontology-stratigraphy).

Students are encouraged to attend an off-campus field camp, for which scholarship funds may be available.

Requirements
1. Satisfy the general education requirements and the bachelor of science degree requirements (page 18).
2. Satisfactorily complete MATH 425 and 426, CHEM 403-404 (or CHEM 405), PHYS 407-408 and, PHYS 505 or ESCI 658. Some of these courses may also satisfy Group 2 and part of Group 3 of the general education requirements.
3. Complete a minimum of twelve courses in earth sciences, which should include ESCI 401, Principles of Geology, or ESCI 409, Environmental Geology; ESCI 402, Earth History; ESCI 501, Introduction to Oceanography; ESCI 512, Principles of Mineralogy; ESCI 614, Optical Mineralogy and Petrography; ESCI 530, Field Methods; ESCI 631, Structural Geology; ESCI 561, Surfacical Processes; ESCI 652, Paleontology; and three approved earth sciences 700-level electives.
4. Complete four approved science/math electives. The following should be considered: one additional 700-level course in the earth sciences; additional courses in mathematics, chemistry, and physics; as well as courses in computer science, engineering, and the biological sciences; and an off-campus field camp.

Geology Minor
Any University student who is interested in earth sciences may minor in geology. The minor consists of at least 18 semester hours, typically from five ESCI courses, each with a grade of C- or better, while maintaining a cumulative grade-point average of 2.0. A maximum of 8 credits may be used for both major and minor credit. Courses include both introductory and more advanced courses. Specific course requirements are flexible to accommodate the student's interest in different facets of the geosciences. Interested students should see the earth sciences' undergraduate coordinator to complete an Intent to Minor form no later than their junior year.

Environmental Sciences
www.unh.edu/envsci/
The College of Engineering and Physical Sciences (CEPS) and the College of Life Science and Agriculture (COLSA) jointly offer a Bachelor of Science Degree in Environmental Sciences. Environmental sciences is an interdisciplinary field concerned with the interaction of biological, chemical, and physical processes that shape our natural environment. Students graduating with a degree in Environmental Sciences will have an understanding of these interacting processes, the ability to effectively communicate with both scientific and lay audiences, competency in field methods appropriate for entry-level environmental science positions, competency in the use and application of geographic information systems (GIS), a basic understanding of environmental policy, and the ability to contribute to multidisciplinary teams.

Requirements
In addition to general education requirements, two introductory environmental science courses are required, including Environmental Pollution and Protection (ENE 520). Foundation courses include two semesters of chemistry (CHEM 403, 404) and calculus (MATH 425, 426), one semester of geology (ESCI 401, 402, or 409), one semester of statistics (MATH 644 or BIOL 528), and either two semesters of physics (PHYS 407, 408) and one semester of approved biology or one semester of physics (PHYS 407) and two semesters of approved biology. Core courses include Techniques in Environmental Sciences (ESCI 534); Introduction to GIS (ESCI 658); Natural Resource and Environmental Policy (NR 602); and a capstone course (e.g., Senior Thesis).

Students must complete an additional seven courses in one of the following options:

Hydrology
ESCI 561, Surfacical Processes
NR 501, Introduction to Soil Sciences or ESCI 512, Principles of Mineralogy
NR 604, Watershed Hydrology
ESCI 705, Principles of Hydrology
ESCI 710, Groundwater Hydrology
Two approved electives

Soil and Watershed Management
NR 501, Introduction to Soil Sciences
NR 604, Watershed Hydrology
NR 703, Watershed Water Quality Management
NR 706, Soil Ecology
Three approved electives

Ecosystems
NR 527, Forest Ecology or BIOL 541, General Ecology
NR 730, Terrestrial Ecosystems
NR 765, Community Ecology
One approved course in taxonomy (e.g., NR 425)
Three approved electives

For a list of approved elective courses and for further information about the major, contact the program coordinator, Serita Frey, Department of Natural Resources, 215 James Hall, (603) 862-3880; e-mail serita.frey@unh.edu.
Electrical and Computer Engineering (ECE)

www.ece.unh.edu/
(For course descriptions, see page 174.)

Chairperson: John R. LaCourse


Affiliate Professors: Thaddeus Kochanski, Robert M. O’Donnell, Stuart M. Selikowitz, Henk Spaanenburg

Affiliate Associate Professors: Michael J. Carter, Allen D. Drake, Andrew D. Kun, Richard A. Messner

Research Associate Professor: William H. Lenhart

Research Associate Professors: Charles H. Bianchi, Raymond J. Garbos, Paul W. Latham II, Jeremy Muldavin

Assistant Professors: Jianqiu Zhang, Kuan Zhou

Research Assistant Professor: Brian P. Calder

Instructor: Francis C. Hludik Jr.

Senior Lecturer: Barbara Dziurla Rucinska

Lecturer: Neda M. Pekaric-Nad

The Department of Electrical and Computer Engineering offers a B.S. in electrical engineering and a B.S. in computer engineering, degree programs that are accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone (401) 347-7700.

ECE Department Mission

The mission of the Department of Electrical and Computer Engineering (ECE) is fourfold:

- to provide educational programs in electrical engineering and computer engineering and related fields at the bachelor’s, master’s, and doctoral levels of high quality and sufficient breadth and depth to serve industry, government and academic institutions of our state and nation;
- to conduct research and pursue scholarship to advance knowledge and apply that knowledge in areas relevant to our state and nation in order to meet the demands of the coming information age and global competition;
- to serve the state and nation by making available the accumulated expertise, knowledge and experience of the faculty to industry and government;
- to continually assess our programs to ensure satisfaction of market needs and to develop strategies to optimize student retention.

The EE and CompE programs endeavor to provide a firm foundation in fundamentals, while also giving students exposure to current technologies for design and implementation. They strive for a balance between theory, laboratory and design experience. Furthermore, the programs foster teamwork and project management skills.

The department recognizes the need to conduct periodic reviews and adjustments to meet the current and projected needs of the state and nation according to its mission objectives.

Our mission was approved by the ECE faculty in March 2001, approved by the ECE Student Advisory Board in October 2001, and ratified by the ECE Industrial Advisory Board in April 2002.

Electrical Engineering and Computer Engineering Program Educational Objectives

The Department of Electrical and Computer Engineering has adopted a set of program educational objectives that consists of statements describing the expected accomplishments of graduates during the first several years following graduation from either program:

- graduates will function at a technically outstanding level in formulating and solving problems in their respective program area;
- graduates will produce competent written and oral reports, and provide project management and leadership;
- through a thorough grounding in engineering fundamentals, graduates will be prepared for a successful engineering career amid future technological changes;
- through a well-rounded education, graduates are able to respond to changing career paths as well as maintain an interest in lifelong learning together with the ability to advance professionally;
- graduates will be creative when dealing with contemporary issues and able to design, prototype, and test electrical and computer engineering designs using state of the art test equipment in the laboratory environment.

The EE and CompE programs endeavor to provide a firm foundation in fundamentals, while also giving students exposure to current technologies for design and implementation. They strive for a balance between theory, laboratory and design experience. Furthermore, the programs foster teamwork and project management skills.

The department recognizes the need to conduct periodic reviews and adjustments to meet the current and projected needs of the state and nation according to its mission objectives. The current electrical engineering program educational outcomes and computer engineering program educational outcomes are:

- an ability to apply knowledge of mathematics, science, and engineering;
- an ability to design and conduct experiments, as well as to analyze and interpret data;
- an ability to design a system, component, or process to meet desired needs;
- an ability to function on multidisciplinary teams;
- an ability to identify, formulate, and solve engineering problems;
- an ability to communicate effectively;
- an understanding of professional and ethical responsibility;
- the broad education necessary to understand the impact of engineering solutions in a global and societal context;
- a recognition of the need for, and ability to engage in, lifelong learning;
- a knowledge of contemporary issues;
- an ability to use techniques, skills, and modern engineering tools necessary for engineering practice.

Electrical and computer program educational outcomes were approved by the ECE faculty in March 2001, approved by the ECE Student Advisory Board in October 2001, and ratified by the ECE Industrial Advisory Board in March 2002.

Students contemplating a decision between the Electrical Engineering and Computer Engineering degree programs should consider both the similarities and differences of the two programs. Both curricula require the same foundational courses in mathematics, physics, analog and digital electronic circuits, and a capstone senior design project. The Computer Engineering degree program requires additional fluency in software development and advanced computer system and hardware design. The Electrical Engineering degree program requires advanced study in analog and mixed-signal...
Mindful of these rules, students, with their advisers' assistance, should plan their credits.

**Electrical Engineering Program**

Electrical engineers design, develop, and produce the electrical and electronic systems upon which modern society has come to depend: basic infrastructure, such as the electric power grid and fiber optic communication lines; public conveniences, such as maglev transporters and LED signs; consumer products, such as iPods and MP3 players; personal communication devices, such as cell phones and BlackBerrys®; military systems, such as rail guns and laser weapons; instruments that can image the ocean floor or analyze the Earth's atmosphere from satellites; and medical diagnostic machines like CAT and MRI scanners. Almost every facet of modern life is touched by the work of electrical engineers.

At UNH, the cornerstone of the electrical engineering program is the involvement of students in the solution of real-world problems. Students electing this major gain knowledge of advanced electronic circuit and system design through the use of computer-aided design tools, hardware circuit prototyping, and hands-on laboratory testing.

In addition to general University requirements, the department has a number of grade-point average and credit requirements.

1. For an electrical engineering major to enter the junior year and take any of the first-term junior courses (ECE 603, ECE 617, ECE 633, or ECE 651), he or she must have taken, and achieved a cumulative grade point average of 2.10 in all of the following freshman and sophomore courses: MATH 425, 426, 527; PHYS 407, 408; and ECE 541, 543, 544, 548, and 562.
2. Any electrical engineering major whose cumulative grade-point average in ECE courses is less than 2.00 during any three semesters will not be allowed to continue as an electrical engineering major.
3. Electrical engineering majors must achieve a 2.00 grade-point average in ECE courses as a requirement for graduation.

To make an exception to any of these departmental requirements based on extenuating circumstances, students must petition the department's undergraduate committee. Mindful of these rules, students, with their advisers' assistance, should plan their programs based on the distribution of courses in the chart below for a total of at least 130 credits.

**Curriculum for B.S. in Electrical Engineering**

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 425, Calculus I</td>
<td>4</td>
<td>-</td>
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<tr>
<td>CS 410, Introduction to Scientific Programming**</td>
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<td>-</td>
</tr>
<tr>
<td>ECE 401, Perspectives in Electrical and Computer Engineering</td>
<td>4</td>
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</tr>
<tr>
<td>CHEM 405, General Chemistry</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>MATH 426, Calculus II</td>
<td>-</td>
<td>4</td>
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<tr>
<td>General Education Elective**</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 407, Physics I</td>
<td>-</td>
<td>4</td>
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<tr>
<td>ENGL 401, First-Year Writing</td>
<td>-</td>
<td>4</td>
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<thead>
<tr>
<th>Sophomore Year</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>PHYS 408, Physics II</td>
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<tr>
<td>MATH 527, Differential Equations with Linear Algebra</td>
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<tr>
<td>ECE 541, Electrical Circuits</td>
<td>4</td>
<td>-</td>
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<tr>
<td>ECE 543, Introduction to Digital Systems</td>
<td>4</td>
<td>-</td>
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<tr>
<td>ME 523, Introduction to Statics and Dynamics</td>
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<tr>
<td>ECE 548, Electronic Design I</td>
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<td>ECE 562, Computer Organization</td>
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<td>EE 617, Junior Lab</td>
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<tr>
<td>EE 651, Electronic Design II</td>
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<tr>
<td>EE 633, Signals and Systems I</td>
<td>3</td>
<td>-</td>
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<tr>
<td>ECE 544, Engineering Analysis</td>
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<td>General Education Elective</td>
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</tr>
<tr>
<td>ECE 618, Junior Laboratory II</td>
<td>-</td>
<td>4</td>
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<tr>
<td>ECE 634, Signals and Systems II</td>
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<tr>
<td>ECE 603, Electromagnetic Fields and Waves</td>
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<tr>
<td>ECE 647, Random Processes and Signals in Engineering</td>
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<td>EE 668 Fundamentals of Computer Engineering</td>
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<td>Professional Elective*</td>
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<tr>
<td>General Education Elective</td>
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<td>-</td>
</tr>
<tr>
<td>General Education Elective</td>
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<td>-</td>
</tr>
<tr>
<td>Professional Elective*</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Professional Elective*</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>General Education Elective</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>ECE 792, Senior Project II</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>14</strong></td>
</tr>
</tbody>
</table>

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**Computer Engineering Program**

Computers have become embedded in virtually every engineering system. Computer engineering, traditionally a subset of electrical engineering, is a rapidly growing field that emphasizes the design, interfacing, hardware/software tradeoffs, and real-time applications of computers. Students who elect this major will gain a knowledge of both hardware and software concepts, and will learn to design, build and test systems containing digital computers.

In addition to general University requirements, the department has a number of grade-point average and credit requirements.

1. For a computer engineering major to enter the junior year and take any of the first-term junior courses, he or she must have taken, and achieved a cumulative grade point average of 2.10 in all of the following freshman and sophomore courses: MATH 425, 426, 527; PHYS 407, 408; CS 415, 416, 515; and ECE 543, ECE 544, ECE 562, and ECE 583.
2. Any computer engineering major whose cumulative grade-point average in ECE and CS courses is less than 2.00 during any three semesters will not be allowed to continue as a computer engineering major.
3. Computer engineering majors must achieve a 2.00 grade-point average in ECE courses as a requirement for graduation.

To make an exception to any of these departmental requirements based on extenuating circumstances, students must petition the department's undergraduate committee. Mindful of these rules, students, with their advisers' assistance, should plan their programs based on the distribution of courses in the chart below for a total of at least 130 credits.

**Curriculum for B.S. in Computer Engineering**

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 425, Calculus I</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>CS 415, Intro to Computer Science I</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>ECE 401, Perspectives in Electrical and Computer Engineering</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>General Education Elective</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>MATH 426, Calculus II</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>CS 416, Intro to Computer Science II</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>ECE 543, Intro to Digital Systems</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 401, First-Year Writing</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 407, Physics I</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>MATH 527, Differential Equations with Linear Algebra</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>CS 515, Data Structures</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>ECE 562, Computer Organization</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>PHYS 408, Physics II</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>CS 516, Software Design and Development</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>ECE 583, Design with Programmable Logic</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>General Education Elective</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>
The College of Engineering and Physical Sciences offers a bachelor of science degree in environmental engineering (ENE) and an interdisciplinary minor in environmental engineering. The bachelor of science degree in environmental engineering is a process-based program that draws on the principles of chemistry, physics, mathematics, and engineering sciences. Due to the complex nature of many aspects of environmental pollution, a broad understanding of the fundamentals of engineering and sciences forms the most desirable preparation for a career in the environmental field. The program is designed to provide training not only for end-of-pipe pollution control technologies, but also for expertise in process engineering and process design, essential for achieving the objectives of pollution curtailment and prevention. Such training is especially valuable in resolving industrial pollution problems. Career opportunities for environmental engineers with this background are found in industry, research institutes, government agencies, teaching, and consulting practice. Students may also enter graduate study at the M.S. or Ph.D. levels.

Mission
The environmental engineering program offers an undergraduate degree in environmental engineering that prepares students for productive careers in the public and private sectors and graduate studies. The program emphasizes fundamental principles in environmental engineering and design, built upon a strong base of chemistry, physics, mathematics, and engineering science. The program prepares students to work in multidisciplinary teams that analyze, formulate and communicate sustainable solutions to complex environmental problems.

The importance of developing sustainable solutions that provide economic, social, and environmental benefits to society is emphasized. The program instills in its students an appreciation of the responsibilities of engineers to society and teaches them the skills necessary to continue learning and improving their professional expertise throughout their careers.

The ENE degree program provides an opportunity for students to specialize in industrial or municipal processes. The curriculum prepares students to plan and design systems to minimize the impact of human activity on the environment and protect human health.

Educational Objectives
ENE program graduates will have the skills, experience, and knowledge to pursue successful careers as environmental engineers. They will also have demonstrated the ability to identify information needs; locate information resources, and/or design laboratory or field experiments to attain required information; and evaluate and synthesize data with sound engineering principles, methodologies, and the latest technology into creative, sustainable, safe, and economical engineering solutions to environmental engineering problems. The solutions they develop will minimize the impact of human activities on the environment and protect human health. Program graduates will have a foundation for advanced studies in environmental engineering and oral and written communication skills that will enable them to clearly explain engineering options and recommend solutions to stakeholders. ENE program graduates will have demonstrated in-depth knowledge within environmental engineering and an awareness of potential social, economic, political, and environmental impacts of engineering practices. They will have an appreciation of the contribution of environmental engineers to the benefit of society and the responsibilities of a professional environmental engineer. They will work as part of multidisciplinary teams to arrive at solutions to environmental engineering problems. ENE program graduates will be prepared to obtain professional engineering licensure; have the capacity to continue learning and improving their professional expertise and skills by participating in professional associations, conferences, workshops and courses; and understand the importance of continued professional development.

At the end of the sophomore year, students are required to have a minimum overall grade-point average of 2.00 and a grade-point average of 2.00 in all mathematics, physics, chemistry, and engineering courses to be permitted to enroll in junior-level courses. To qualify for graduation, an ENE major must: have satisfied the previously specified course requirements, have satisfied the University’s general education requirements, have a minimum cumulative grade-point average of 2.00, and have a minimum grade-point average of 2.00 in engineering courses.

Bachelor of Science in Environmental Engineering-Industrial Processes (IP) Emphasis
The industrial processes (IP) emphasis of environmental engineering is a process-based program that draws on the principles of chemistry, physics, mathematics, and engineering sciences. Due to the complex nature of many aspects of environmental pollution, a broad understanding of the fundamentals of engineering and sciences forms the most desirable preparation for a career in the environmental field. The program is designed to provide training not only for end-of-pipe pollution control technologies, but also for expertise in process engineering and process design, essential for achieving the objectives of pollution curtailment and prevention. Such training is especially valuable in resolving industrial pollution problems. Career opportunities for environmental engineers with this background are found in industry, research institutes, government agencies, teaching, and consulting practice. Students may also enter graduate study at the M.S. or Ph.D. levels.

Engineering design is a critical aspect of the IP curriculum. In order to meet the objective of producing creative, problem-solving engineers, design concepts are introduced early in the curriculum and design experience is integrated into every engineering course. Students learn to seek optimal solutions to open-ended problems and function in design-based team projects.
Design ability is finally demonstrated at the end of the capstone course (ENE 608), when self-directed teams develop a comprehensive design report for a full-scale engineering process based on a national process design competition problem.

Since 1993, the program faculty has administered a pollution prevention internship program with industries in New Hampshire, Maine, and Massachusetts, initially funded by US EPA and NHDES. In the past twelve years, the program has served more than forty facilities. Each year about 12 students have enrolled in the pollution prevention internship program which provides hands-on industrial employment for ten weeks during the summer assisting industry with projects in process modification, material substitution, chemical re-use, risk assessment, safety and economic analysis. The program faculty also assisted NHDES in setting up instrumentation in the Seacoast region of New Hampshire to monitor the precursor of ozone formation.

The B.S. program requires a minimum of 136 credits for graduation and can be completed in four years. There are nine electives in the curriculum: six for the fulfillment of the University's general education requirements and the remaining three for technical electives to be chosen from the specified elective course list. Due to the substantial overlap in course requirements for the environmental engineering IP and chemical engineering majors, students will be able to transfer between these programs during the first three semesters without losing any course credits towards graduation.

### First Year

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHE 405</td>
<td>General Chemistry</td>
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</tr>
<tr>
<td>MATH 425-426</td>
<td>Calculus I &amp; II</td>
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<tr>
<td>PHYS 407</td>
<td>General Physics I</td>
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<td>ENGL 401</td>
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<td>ENE 400</td>
<td>Environmental Engineering Lectures I</td>
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<td>ENE 401</td>
<td>Environmental Engineering Lectures II</td>
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**Total** 17 17

### Second Year

<table>
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<th>Course Code</th>
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<td>CHE 501-502</td>
<td>Introduction to Chemical Engineering I &amp; II</td>
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<tr>
<td>CHEM 683-684</td>
<td>Physical Chemistry I &amp; II</td>
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<td>CHEM 685</td>
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<td>MATH 527</td>
<td>Differential Equations</td>
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<td>CS 410</td>
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**Total** 16 18

### Third Year

<table>
<thead>
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<td>ENE 645</td>
<td>Fundamental Aspects of Environmental Engineering</td>
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<td>ENE 749</td>
<td>Water Chemistry</td>
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<td>ENE 756</td>
<td>Environmental Engineering and Microbiology</td>
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<tr>
<td>ENE 742</td>
<td>Solid and Hazardous Waste Engineering</td>
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**Total** 16 16

### Fourth Year

<table>
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<td>ENE 608</td>
<td>Industrial Process Design</td>
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<td>ENE 613</td>
<td>Unit Operations Lab II</td>
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<td>ENE 709</td>
<td>Fundamentals of Air Pollution and Control</td>
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<td>ENE 752</td>
<td>Process Dynamics and Control</td>
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<td>ENE 772</td>
<td>Physiochemical Processes for Water/Air Quality</td>
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<td>ESCI 710</td>
<td>Groundwater Hydrology</td>
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<td>MIRC 501</td>
<td>Microbes in Human Disease</td>
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### Suggested Technical Electives

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<tr>
<td>CHE 606</td>
<td>Chemical Engineering Kinetics</td>
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<tr>
<td>CHE 744</td>
<td>Corrosion</td>
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<tr>
<td>ENE 739</td>
<td>Industrial Wastewater Treatment</td>
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</tr>
<tr>
<td>ENE 746</td>
<td>Bioenvironmental Engineering Design</td>
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</tr>
<tr>
<td>ENE 747</td>
<td>Introduction to Marine Pollution</td>
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<td>CIE 766</td>
<td>Introduction to Geo-Environmental Engineering</td>
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<td>ESCI 409</td>
<td>Environmental Geology</td>
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</tr>
<tr>
<td>ESCI 561</td>
<td>Surficial Processes</td>
<td>4</td>
</tr>
<tr>
<td>ESCI 705</td>
<td>Principles of Hydrology</td>
<td>4</td>
</tr>
<tr>
<td>ESCI 708</td>
<td>Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 715</td>
<td>Global Atmospheric Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>MICRO 503</td>
<td>General Microbiology</td>
<td>5</td>
</tr>
</tbody>
</table>

### Bachelor of Science in Environmental Engineering-Municipal Processes (MP) Emphasis

Environmental engineers graduating from the municipal processes (MP) emphasis plan, design, and construct public and private facilities to minimize the impact of human activity on the environment and to protect human health. For example, environmental engineers with a municipal processes perspective design and build drinking water treatment systems, municipal and industrial wastewater treatment plants, solid waste management facilities, contaminated ground water remediation systems, and hazardous waste remediation facilities. These facilities must meet regulatory requirements, be cost-effective to build and maintain, be safe to operate, and have minimal environmental impact.

In ENE 400 and 401, students are introduced to the full spectrum of environmental engineering projects that they will subsequently explore in design teams during their degree program. As part of these experiences, students visit and tour field sites, and interact with engineers who have been involved in the design and/or construction of the projects. Design is integrated throughout the curriculum, and particularly emphasized in junior- and senior-level courses. As part of these projects, students analyze treatment alternatives, recommend a system that meets regulatory operational needs, and prepare an implementation schedule and project budget. Detailed design projects are performed in ENE 744 and 746. ENE 788 serves as a capstone design experience where students work on a multi-interdisciplinary environmental engineering project as part of the U.S. Department of Energy's international WERC competition held in New Mexico every April, and apply skills learned in other courses while working with real world clients.

The following schedule is a sample of a planned program for environmental engineering students completing the major within the municipal processes emphasis.

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENE 400, 401, Environmental Engineering Lectures I, II</td>
<td>1 1</td>
<td></td>
</tr>
<tr>
<td>ENGL 401, First-Year Writing</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>MATH 425, 426, Calculus I, II</td>
<td>4 4</td>
<td></td>
</tr>
<tr>
<td>General Education Electives*</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CHEM 405, General Chemistry</td>
<td>4 4</td>
<td></td>
</tr>
<tr>
<td>PHYS 407, General Physics I</td>
<td>- 4</td>
<td></td>
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</tbody>
</table>

**Total** 17 17

<table>
<thead>
<tr>
<th>Second Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENE 520, Environmental Pollution and Protection</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENE 521, Environmental Engineering Seminar</td>
<td>- 1</td>
<td></td>
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<tr>
<td>CIE 525, Statics</td>
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<td></td>
</tr>
<tr>
<td>MATH 527, Differential Equations with Linear Algebra</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>MATH 644, Probability and Statistics</td>
<td>- 4</td>
<td></td>
</tr>
<tr>
<td>CHEM 545, Organic Chemistry Lecture</td>
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<td></td>
</tr>
<tr>
<td>CHEM 546, Organic Chemistry Laboratory</td>
<td>- 3</td>
<td></td>
</tr>
<tr>
<td>CIE 533, Project Engineering</td>
<td>- 3</td>
<td></td>
</tr>
<tr>
<td>TECH 564, Fundamentals of CAD</td>
<td>- 3</td>
<td></td>
</tr>
<tr>
<td>General Education Elective*</td>
<td>- 4</td>
<td></td>
</tr>
</tbody>
</table>

**Total** 16 16

<table>
<thead>
<tr>
<th>Third Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIE 462, Fluid Mechanics</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Technical Elective**</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENE 645, Fundamental Aspects of Environmental Engineering</td>
<td>- 4</td>
<td></td>
</tr>
<tr>
<td>ENE 749, Water Chemistry</td>
<td>- 4</td>
<td></td>
</tr>
<tr>
<td>ENE 756, Environmental Engineering and Microbiology</td>
<td>- 4</td>
<td></td>
</tr>
<tr>
<td>ENE 742, Solid and Hazardous Waste Engineering</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total** 3-4 3-4

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**Notes:**
- **Elective** courses are chosen from the specified list.
- **Technical Elective** courses are chosen from the specified list.
- **General Education Elective** courses are chosen from the specified list.
- **MP Emphasis** courses are chosen from the specified list.
Choice of elective courses should be made in consultation with the minor area adviser, James P. Malley, civil engineering, or Dale P. Barkey, chemical engineering. Students normally start this program in the junior year and should declare their intention to enter the program as early as possible during the sophomore year. During the final semester, students must apply to the dean to have the minor appear on the transcript.

International Affairs (dual major)
(For program description, see page 111.)

Mathematics & Statistics (MATH)
www.math.unh.edu
(For course descriptions, see page 207.)

Chairperson: Eric L. Grinberg
Professors: Albert B. Bennett, Jr., Liming Ge, Karen J. Graham, Eric L. Grinberg, Donald W. Hadwin, Rita A. Hibschweiler, A. Robb Jacoby, Ernst Linder, Eric A. Nordgren, Samuel D. Shore, Kevin M. Short, Marianna A. Shubov
Associate Professors: David V. Feldman, William E. Geeslin, Edward K. Hinson, Berrien Moore III, Dmitri A. Nikshych
Assistant Professors: Maria Basterra, Linyuan Li
Instructor: Philip J. Ramsey
Lecturers: Mehmet Orhon, Neil Portnoy, Junhae Shen, Yitang Zhang

The Department of Mathematics & Statistics offers a variety of programs. These programs provide flexibility through elective choices and are designed to maximize educational and employment opportunities. Each student must enroll in one specific program; however, changes between programs can usually be accommodated.

The first two years of all programs are similar. In the first year, students are expected to take Calculus I (MATH 425) and Calculus II (MATH 426) as well as an introductory computer programming course (CS 410, or CS 415). A sophomore typically takes follow-up calculus courses in differential equations (MATH 527) and multidimensional calculus (MATH 528), an introductory statistics course (MATH 639) and a course in mathematical proof (MATH 531, or MATH 545).

In addition to its degree programs, the department has an active interest in the actuarial profession and is an examination center for the Society of Actuaries. Those interested in actuarial science should seek the advice of the coordinator of the actuarial program in the department.

For more information about the department's undergraduate programs, visit www.math.unh.edu.

Standards for Graduation
To be certified for graduation with a degree from the Department of Mathematics and Statistics, a student must complete all courses used to satisfy the requirements for the major program with a grade of C- or better and have an overall grade-point average of at least 2.00 in these courses.

Bachelor of Arts, Mathematics Major
This program may offer a broader liberal arts program than the bachelor of science degree programs. By a careful selection of electives, students can shape this major into a preparation for graduate school, business, or industry.

Required MATH courses
MATH 425, Calculus I
MATH 426, Calculus II
MATH 527*, Differential Equations with Linear Algebra
MATH 528*, Multidimensional Calculus
MATH 531, Mathematical Proof; or
MATH 545, Introduction to Linear Algebra and Mathematical Proof
MATH 539, Introduction to Statistical Analysis
MATH 761, Abstract Algebra
MATH 762, Linear Algebra
MATH 767, One-Dimensional Real Analysis

Other required courses
Two approved MATH electives chosen in consultation with your academic adviser
CS 410, Introduction to Scientific Programming or CS 415, Introduction to Computer Science I
Foreign language requirement as defined by the University for the B.A. degree.

Bachelor of Science in Mathematics
This program offers the strongest concentration in mathematics, requiring courses that are intended to prepare the student for graduate work in mathematics. Through a judicious choice of electives, students may design stronger pre-graduate programs, a program in applied mathematics, or slant the program toward a career in business or industry.

Required MATH courses
MATH 425, Calculus I
MATH 426, Calculus II
MATH 527*, Differential Equations with Linear Algebra
MATH 528*, Multidimensional Calculus
MATH 531, Mathematical Proof; or
MATH 545 Introduction to Linear Algebra and Mathematical Proof
MATH 539, Introduction to Statistical Analysis
MATH 761, Abstract Algebra
MATH 762, Linear Algebra

Environmental Engineering Minor
The environmental engineering minor is intended primarily for students in engineering and physical sciences, who are not in the chemical, civil, or environmental engineering degree programs. Students contemplating such a minor should plan on a strong background in the sciences and mathematics (including differential equations).

The minor provides a comprehensive introduction to major areas of interest in environmental protection, namely air pollution and water pollution, through the three required courses. Further breadth in environmental engineering or depth in specific areas can be attained through the choice of appropriate elective courses.

The minor requires a minimum of five courses as follows: 1) three required courses: ENE 645, Fundamental Aspects of Environmental Engineering; ENE 709, Fundamentals of Air Pollution and Its Control; ENE 772, Physicochemical Processes for Water and Air Quality Control, or ENE 743, Environmental Sampling and Analysis; 2) a minimum of two elective ENE courses.
One approved CS elective chosen in consultation with your academic adviser.

CS 410, Introduction to Scientific Programming; or CS 415, Introduction to Computer Science I
PHYS 407-408, General Physics I and II, which may be used to satisfy general education requirements in Group 3

Bachelor of Science: Interdisciplinary Programs in Mathematics and Its Applications

The programs in interdisciplinary mathematics prepare students for employment in areas of applied mathematics and statistics. Some of them can lead to graduate work in appropriate fields (e.g., physics, computer science, or economics). The major may consist of mathematics combined with Computer Science, Economics, Statistics, Electrical Science, or Physics.

Each program requires ten mathematics courses along with at least six courses in the discipline of the option.

Requirements

Required courses in all options:
MATH 425, Calculus
MATH 426, Calculus II
MATH 527*, Differential Equations with Linear Algebra
MATH 528*, Multidimensional Calculus
MATH 531, Mathematical Proof; or MATH 545, Introduction to Linear Algebra and Mathematical Proof
MATH 539, Introduction to Statistical Analysis
MATH 645*, Linear Algebra for Applications
CS 410, Introduction to Scientific Programming; or CS 415, Introduction to Computer Science I

Note: If MATH 545 is taken, credit may not be earned for MATH 645 so that students must choose a MATH elective in consultation with their academic adviser.

Other required courses by option

Computer Science Option
MATH 532, Discrete Mathematics
MATH 753, Introduction to Numerical Methods I
One approved MATH elective chosen in consultation with your academic adviser.

CS 415, Introduction to Computer Science I
CS 416, Introduction to Computer Science II
CS 515, Data Structures
CS 516, Introduction to Software Design and Development
CS 520, Assembly Language Programming and Machine Organization
CS 620, Operating System Fundamentals
CS 659, Introduction to the Theory of Computation; or CS 658, Analysis of Algorithms
One approved CS elective chosen in consultation with your academic adviser.

Economics Option
MATH 739, Applied Regression Analysis
One MATH course chosen in consultation with your academic adviser from the following courses:
MATH 740, Design of Experiments I
MATH 741, Biostatistics and Life Testing
MATH 742, Multivariate Statistics Methods
MATH 755, Probability and Stochastic Processes with Applications

One approved MATH elective chosen in consultation with your academic adviser.

Electrical Science Option
MATH 646, Introduction to Partial Differential Equations
MATH 647, Complex Analysis for Applications
MATH 753, Introduction to Numerical Methods I
PHYS 407, Physics I
PHYS 408, Physics II
PHYS 505-506, Physics III

Three PHYS courses, chosen in consultation with your academic adviser, from the following courses:

PHYS 508, Thermodynamics and Statistical Mechanics
PHYS 616, Physical Mechanics
PHYS 701, Introduction to Quantum Mechanics I
PHYS 702, Introduction to Quantum Mechanics II
PHYS 703, Electricity and Magnetism I
PHYS 704, Electricity and Magnetism II
PHYS 708, Optics

Physics Option
MATH 646, Introduction to Partial Differential Equations
MATH 647, Complex Analysis for Applications
MATH 753, Introduction to Numerical Methods I
PHYS 407, Physics I
PHYS 408, Physics II
PHYS 505-506, Physics III

Three PHYS courses, chosen in consultation with your academic adviser, from the following courses:

PHYS 508, Thermodynamics and Statistical Mechanics
PHYS 616, Physical Mechanics
PHYS 701, Introduction to Quantum Mechanics I
PHYS 702, Introduction to Quantum Mechanics II
PHYS 703, Electricity and Magnetism I
PHYS 704, Electricity and Magnetism II
PHYS 708, Optics

Statistics Option
MATH 739, Applied Regression Analysis
MATH 755, Probability and Stochastic Processes with Applications
MATH 756, One-Dimensional Real Analysis
Mathematical Proof

Three MATH courses, chosen in consultation with your academic adviser, from the following courses:

MATH 740, Design of Experiments I
MATH 741, Biostatistics and Life Testing
MATH 742, Multivariate Statistics Methods

Three approved MATH courses chosen in consultation with your academic adviser.

Bachelor of Science in Mathematics Education

This professional degree program prepares students for mathematics teaching at the elementary, middle/junior high, or secondary level. The program is coordinated with the education department’s teacher certification programs.

For the elementary option, full certification requires the five-year program. Students may complete the degree requirements for middle/junior high or secondary option with full teacher certification in either four or five years. Students electing the four-year option must plan for one semester of student teaching (EDUC 694) in their senior year and must consult with the departmental adviser in order to accommodate the scheduling of required MATH courses. The five-year program requires a year-long teaching internship in the fifth year that can be coupled with other graduate work leading to a master’s degree. See Education, College of Liberal Arts, page 32.

Elementary School Option

Required MATH courses:
MATH 425, Calculus I
MATH 426, Calculus II
MATH 539, Introduction to Statistical Analysis
MATH 545, Introduction to Linear Algebra and Mathematical Proof
MATH 619, Historical Foundations of Mathematics
MATH 621, Number Systems for Teachers
MATH 622, Geometry for Teachers
MATH 623, Topics in Mathematics for Teachers
MATH 657, Geometry
MATH 700, Introduction to Mathematics Education
MATH 703, The Teaching of Mathematics, K-6

Other required courses:

Two approved MATH electives chosen in consultation with your academic adviser:

CS 410, Introduction to Scientific Programming; or CS 415, Introduction to Computer Science I
PHYS 406, Introduction to Modern Astronomy, which may be used to satisfy general education requirements in Group 3

EDUC 500, Exploring Teaching
EDUC 700, Educational Structure and Change
EDUC 701, Human Development and Learning: Educational Psychology
EDUC 705, Alternative Perspectives on the Nature of Education
EDUC 706, Introduction to Reading Instruction in the Elementary Schools

Note: EDUC 703F, EDUC 703M, and EDUC 751 are required for middle/junior high or secondary option.

Elementary Schools

Group 3

CS 410, Introduction to Scientific Programming; or CS 415, Introduction to Computer Science I
PHYS 407, General Physics I
PHYS 408, General Physics II

Other required courses:

Two approved MATH electives chosen in consultation with your academic adviser:

CS 410, Introduction to Scientific Programming; or CS 415, Introduction to Computer Science I
PHYS 407, General Physics I
PHYS 408, General Physics II

Other required courses:

Two approved MATH electives chosen in consultation with your academic adviser:

Physics Option

MATH 646, Introduction to Partial Differential Equations
MATH 647, Complex Analysis for Applications
MATH 753, Introduction to Numerical Methods I
PHYS 407, Physics I
PHYS 408, Physics II
PHYS 505-506, Physics III

Three PHYS courses, chosen in consultation with your academic adviser, from the following courses:

PHYS 508, Thermodynamics and Statistical Mechanics
PHYS 616, Physical Mechanics
PHYS 701, Introduction to Quantum Mechanics I
PHYS 702, Introduction to Quantum Mechanics II
PHYS 703, Electricity and Magnetism I
PHYS 704, Electricity and Magnetism II
PHYS 708, Optics

Statistics Option

MATH 739, Applied Regression Analysis
MATH 755, Probability and Stochastic Processes with Applications
MATH 756, One-Dimensional Real Analysis
Mathematical Proof

Three MATH courses, chosen in consultation with your academic adviser, from the following courses:

MATH 740, Design of Experiments I
MATH 741, Biostatistics and Life Testing
MATH 742, Multivariate Statistics Methods

Three approved MATH courses chosen in consultation with your academic adviser.

*These requirements can be satisfied by MATH 525-526, Linearity I-II
Middle/Junior High School Option

Required MATH courses
MATH 425, Calculus I
MATH 426, Calculus II
MATH 539, Introduction to Statistical Analysis
MATH 545, Introduction to Linear Algebra and Mathematical Proof
MATH 619, Historical Foundations of Mathematics
MATH 621, Number Systems for Teachers
MATH 622, Geometry for Teachers
MATH 623, Topics in Mathematics for Teachers
MATH 657, Geometry
MATH 698, Senior Seminar
MATH 700, Introduction to Mathematics Education
MATH 780, Teaching of Mathematics, 5-8

Other required courses
Two approved MATH electives chosen in consultation with your academic adviser.

Secondary School Option

Required MATH courses
MATH 425, Calculus I
MATH 426, Calculus II
MATH 527, Differential Equations with Linear Algebra
MATH 528, Multidimensional Calculus
MATH 539, Introduction to Statistical Analysis
MATH 545, Introduction to Linear Algebra and Mathematical Proof
MATH 619, Historical Foundations of Mathematics
MATH 624, Analysis for Secondary School Teachers
MATH 657, Geometry
MATH 698, Senior Seminar
MATH 761, Abstract Algebra
MATH 700, Introduction to Mathematics Education
MATH 791, Teaching of Mathematics, 7-12

Other required courses
One approved MATH elective chosen in consultation with your academic adviser.

Other required courses
CE 410, Introduction to Scientific Programming; or
CE 415, Introduction to Computer Science I
EDUC 500, Exploring Teaching
EDUC 700, Educational Structure and Change
EDUC 701, Human Development and Learning: Educational Psychology
EDUC 705, Alternative Perspectives on the Nature of Education

Note: EDUC 751 is a requirement for certification that may be taken as an undergraduate.

Minoring in Mathematics

The Department of Mathematics and Statistics offers three minor programs: Mathematics, Applied Mathematics, and Statistics. These programs, which are open to all students enrolled at the University, require a minimum of five MATH courses as detailed below. Students, whose major program requires more than two courses required by the minor program, must substitute additional courses from the list of elective courses to meet the five-course minimum for the minor.

Mathematics Minor
Required (3): MATH 528, MATH 531 (or 545), and MATH 761 (or 767)
Electives (2): Two courses chosen from among MATH 527*, 656, 657, 658, 761, 762, 764, 767, 776, 783, 784, 788

Applied Mathematics Minor
Required (4): MATH 527, 528, 645 (or 545), and 753
Electives (1): One course chosen from among MATH 539 (or 644), 646, 647, 745, 746, 747, or 754

Statistics Minor
Required (2): MATH 539 (or 644) and MATH 645 (or 545)
Electives (3): Three courses chosen from among MATH 737, 739, 740, 741, 742, 744, 755, 756

Mechanical Engineering (ME)

www.unh.edu/mechanicalengineering/
(For course descriptions, see page 210.)

Chairperson: Todd S. Gross

Professors: Kenneth C. Baldwin, Barbaros Celikkok, Barry K. Fussell, Todd S. Gross, Robert Jerard, Joseph C. Klewicki, James E. Kranowski, M. Robinson Swift, David W. Watt

Associate Professors: Gregory P. Chini, John Philip McHugh, May-Win L. Thein, Igor I. Tsukrov

Affiliate Associate Professors: Donald M. Esterling, Vladimir Riabov

Assistant Professors: Brad Lee Kinsey, Christopher White

Affiliate Assistant Professor: Timothy Upon

The Mechanical Engineering Program at UNH is accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone (410) 347-7700.

Mission

In support of the University and college missions, the Department of Mechanical Engineering is dedicated to educating the highest quality engineering professionals and leaders. Our graduates will be prepared to creatively solve engineering problems through the use of analysis, computation, and experimentation. The students completing our program should be well-informed citizens who have the ability to grow intellectually and are able to solve new, challenging problems with self-confidence. It is our intent to maintain a general and flexible curriculum that prepares students for both industrial practice and graduate education.

Educational Objectives

The goal of the UNH mechanical engineering program is to produce graduates that are good professionals and good citizens who 1) skillfully apply the fundamental principles of mathematics, science, and engineering; 2) solve engineering problems by integrating strong design, analysis, and experimental abilities with excellent communication skills; 3) successfully contribute to their respective corporate, government, or academic organizations; 4) demonstrate continuous growth by assuming positions of leadership in their profession, or by becoming successful entrepreneurs; by successfully completing advanced degrees and professional education; 5) are broadly educated citizens of society with an understanding of the impact of engineering solutions in a global/societal context; and 6) demonstrate a high level of personal and social integrity through their ethical behavior and service to their peers, employers, communities, a challenge, and the nation, the world.

Mechanical engineering is a challenging profession encompassing research, design, development, and production of aerospace vehicles, underwater vessels, instrumentation and control systems, nuclear and conventional power plants, and consumer and industrial products in general. The profession also makes contributions through more fundamental studies of material behavior, the mechanics of solids and fluids, and energy transformation. Additional information can be found at the mechanical engineering Web site.

The Program

The program begins with courses in physics, mathematics, chemistry, and computer aided design. The department has a four-semester mechanics thread, a four-semester thread in the thermal/fluid sciences, and a three-semester thread in systems and controls. Modern experimental methods are taught in a two-semester course starting in the junior year. The two-semester senior design project requires students to utilize the skills they have learned in their courses and to learn how to function in an engineering team. The five technical electives offered in the program give the students the opportunity to focus on advanced technical areas of their choice.

* MATH 525 and MATH 526 (Linearity I and II) may be substituted for MATH 527 and MATH 528 and a MATH technical elective.
With their advisers’ assistance, students should plan a program based on the following distribution of courses that totals not less than 128 credits. The outline that follows is typical only in format. Within the constraints of satisfying all the requirements and having all the necessary prerequisites, schedules may vary because of scheduling needs or student preference. Some mechanical engineering elective courses may not be offered every year.

The curriculum has eleven elective courses. These should be selected in consultation with a departmental adviser to lead to a balanced program that addresses areas of interest. Five of the elective courses are selected from groups four through eight of the University’s general education requirements, with the Group 7 general education course being either ECON 402 or EREC 411. One of the elective courses must be selected from the biological science listing of Group 3 of the general education requirements.

Five technical elective courses at least three credits each are required. They may be selected from 600–700 level courses in the College of Engineering and Physical Sciences, except for one course that may be selected from one of the following 400–500 level courses: ME 442, ME 542, ENE 520, ESCI 501, and ECE 543. Two technical electives can be used for studying a focused area such as a foreign language, professional program, or minor, with mechanical engineering department approval.

Some programs may require additional elective courses to reach the minimum of 128 credits required for graduation. Other programs may exceed 128 credits to include all the required courses.

To enter the junior-year courses in the mechanical engineering major, students must have at least a 2.00 combined grade-point average for the following group of courses: PHYS 407–408, ME 503, ME 525, and ME 526.

In order to graduate in the mechanical engineering major, students must have at least a 2.00 grade-point average in all engineering and science courses, including required technical electives normally taken as department requirements after the start of the junior year. The option of repeating required engineering, science, and technical elective courses normally taken after the start of the junior year may be exercised in only one of the following: 1) one course may be repeated twice; and 2) a maximum of two courses may be repeated once.

### Mechanical Engineering Minor

The minor, administered by the Department of Mechanical Engineering, is open to all students of the University and offers a broad introduction to mechanical engineering.

Students must complete a minimum of six courses as follows: ME 441, ME 525, ME 526, ME 627, ME 503, and ME 608. Electrical and Computer Engineering majors should take the following courses: ME 441, ME 523, ME 526, ME 503, ME 608, and ME 561.

By midsemester of their junior year, interested students should consult the chair of the mechanical engineering department.

### Materials Science Minor

The minor, administered by the Department of Mechanical Engineering, is open to all students of the University and offers a broad introduction to materials science.

Students must complete at least 18 credits and a minimum of five courses as follows: ME 561 (required); ME 760 (required); and ME 730 (required); and two additional courses from the following: 731, 744, 761, 762, 763, and 795 (materials).

By midsemester of their junior year, interested students should consult the minor supervisor, James E. Krzanowski, Department of Mechanical Engineering.

### Physics (PHYS)

www.physics.unh.edu/

(For course descriptions, see page 226.)

**Chairperson:** Dawn C. Meredith


**Research Professors:** Terry Forbes, Philip A. Isenberg, Nelson Maynard, R. Bruce McKibben, Charles W. Smith III

**Associate Professors:** Benjamin D. Chandran, James Connell, Lynn M. Kistler, Mark L. McConnell, Dawn C. Meredith, Karsten Pohl, Joachim Raeder

**Research Associate Professors:** Charles J. Furrugia, Antoinette B. Galvin, Vania K. Jordanova, Harold Kucharek, Mark R. Lessard, Clifford Lopate, Edward F. Tedesco, Bernard J. Vasquez

**Assistant Professors:** Silas Robert Beane III, Per Berglund, Maurik Holtrop

**Research Assistant Professors:** John C. Dorelli, Yuri E. Litvinenko, Chung-Sang Ng

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* MATH 525 and 526. Linearity may be substituted for MATH 527 and 528, and a technical elective course.

** TECH 797 Undergraduate Ocean Research Project may be substituted for ME 755 and ME 756.
Physics is concerned with the properties of matter and the laws that describe its behavior. It is an exact science based on precise measurement, and its objective is the kind of understanding that leads to the formulation of mathematical relationships between measured quantities. As a fundamental science, its discoveries and laws are basic to understanding in nearly all areas of science and technology. Advances in such diverse fields as medical instrumentation, solid state electronics, and space research have relied heavily on the application of basic physical laws and principles.

Students interested in the study of physics at the University of New Hampshire will find a strong interaction between research and academic programs. Undergraduates have participated in research studies ranging from nuclear scattering experiments at major particle accelerators to astrophysical studies of the solar system using space probes. These experiences have proven beneficial to engineering and physics students alike. The department has its own library, which provides a comfortable, inviting atmosphere for study and relaxed reading.

The suggested programs that follow are indicative of the flexibility available to students, whether they are preparing for graduate work in physics or astronomy, industrial opportunities, governmental research, secondary-level teaching, or a general education that might utilize the fundamental knowledge of physics.

Several undergraduate degree programs are offered through the Department of Physics. The B.S. degree is designed for students who wish to work as professional physicists or engineers; the interdisciplinary options allow for students to combine physics with other disciplines. The B.A. degree is designed for students who want a strong background in physics but also want a broad liberal arts education. A minor in physics allows a student to combine an interest in physics with another major.

Physics related degrees are also offered in other departments. For those students with strong interests in both math and physics, the Department of Mathematics offers a B.S. interdisciplinary option in physics (see page 67). For those interested in a career as a middle or high school educator in both physics and chemistry, the Department of Chemistry offers a B.A. in chemistry and physics teaching.

Interested students are encouraged to contact the department for further information. More detailed information is also on the physics department Web page at www.physics.unh.edu.

Minor in Physics
The minor in physics consists of five courses in physics. All students must take PHYS 407, 408, and 505, including labs. Two other physics courses at the 500 level or above must be chosen in consultation with the student's physics minor adviser.

Bachelor of Arts, Chemistry and Physics Teaching
(For information, see page 57.)

Physics Major, Bachelor of Arts
This degree provides an opportunity for a broad and liberal arts education, which in some cases may be sufficient for graduate work. A judicious choice of electives may also prepare students for interdisciplinary programs that require proficiency in a restricted area of physics.

Requirements
1. Satisfy general education and writing requirements.
2. Satisfy bachelor of arts degree requirements.
3. PHYS 407, 408, 505, 506, 508, 615, 616, 701, 703, 705. Note that MATH 425, 426, and MATH 525, 526 or MATH 527, 528 are prerequisites for some of the courses.

In the following table, "Electives" include general education courses, writing intensive courses, language courses required for the B.A., and free choice electives.

Suggested Curriculum for B.A. in Physics

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Fall</th>
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</thead>
<tbody>
<tr>
<td>PHYS 400, Freshman Seminar</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>PHYS 407-408, General Physics I and II</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>MATH 425, 426, Calculus I and II (Group 2)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 401, First-Year Writing</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 505-506, General Physics III and Lab</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>PHYS 615, Classical Mechanics and Mathematical Physics I</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>MATH 525, Linearity I; or MATH 527, Differential Equations</td>
<td>6 or 4</td>
<td></td>
</tr>
<tr>
<td>MATH 526, Linearity II; or MATH 528, Multidimensional Calculus</td>
<td>6 or 4</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>16 or 18</td>
<td>16 or 18</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 605, Experimental Physics I</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>PHYS 508, Thermodynamics and Statistical Mechanics</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 616, Classical Mechanics and Mathematical Physics II</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>PHYS 701, Introduction to Quantum Mechanics I</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>16</td>
</tr>
</tbody>
</table>

Suggested Curriculum for B.S. in Physics

Bachelor of Science in Physics
The bachelor of science degree in physics prepares students for professional work as physicists. The required courses are those typically necessary for admission to graduate study in physics or astronomy. The interdisciplinary options require fewer physics courses combined with a concentration in another area (chemistry or materials science). The astronomy option emphasizes courses that help prepare a student for advanced studies in astronomy.

Requirements
1. Satisfy general education and writing requirements.
2. Satisfy bachelor of science university requirements.
3. Minimum physics requirements: 400, 407-408, 505, 506, 508, 605, 615-616, 701, 702, 703, 704, 705; two physics electives selected from the 700-level physics courses.
4. Chemistry: 403-404 or 405
5. Math: 425-426, and 525-526 or 527-528
6. Computer Science: CS 410
7. By the end of the spring semester of the sophomore year, a student must have a minimum grade of C in each 400- or 500-level course specifically required for the B.S. degree and an overall grade-point average of at least 2.33 in these courses in order to continue in the B.S. program.

Physics electives
In the following table, "Electives" include general education courses, writing intensive courses, physics electives, and free choice electives. Note that physics electives can only be taken in the junior or senior year because of prerequisites, and are in general offered every other year.

Suggested Curriculum for B.S. in Physics

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 400, Freshman Seminar</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>PHYS 407-408, General Physics I and II</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>MATH 425, 426, Calculus I and II (Group 2)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 401, First-Year Writing</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>
Sophomore Year
PHYS 505-506, General Physics III and Lab  4  -
PHYS 508, Thermodynamics and Statistical Mechanics  -  4
PHYS 615, Classical Mechanics and Mathematical Physics I  -  4
MATH 525, Linearity I  or
MATH 527, Differential Equations  6 or 4  -
MATH 526, Linearity II  or
MATH 528, Multidimensional Calculus  -  6 or 4
CS 410, Introduction to Scientific Programming  4  -
Elective  4  4
Total  16 or 18  16 or 18

Junior Year
PHYS 605, Experimental Physics I  5  -
PHYS 616, Classical Mechanics and Mathematical Physics II  4  -
PHYS 701, Introduction to Quantum Mechanics I  -  4
PHYS 703, Electricity and Magnetism I  -  4
Electives  8  8
Total  17  16

Senior Year
PHYS 702, Quantum Mechanics II  4  -
PHYS 704, Electricity and Magnetism II  4  -
PHYS 705, Experimental Physics II  -  4
Electives  8  12
Total  16  16

Chemical Physics Option, Bachelor of Science in Physics
1. Satisfy general education and writing requirements.
2. Satisfy bachelor of science University requirements.
3. Physics requirements: PHYS 400, 407-408, 505-506, 508, 605, 615, 616, 701, 702, 703, 705, 7095 (4 credit hours), 799 (4 credit hours).
4. Chemistry: CHEM 403-404 or CHEM 405
5. Math: MATH 425-426 and 525-526 or 527-528
6. Computer Science: CS 410
7. Electives in option: Choose one course from PHYS 708, PHYS 712, PHYS 720, PHYS 764, PHYS 791

Materials Science Option, Bachelor of Science in Physics
1. Satisfy general education and writing requirements.
2. Satisfy bachelor of science University requirements.
3. Physics requirements: PHYS 400, 407-408, 505-506, 508, 605, 615-616, 701, 703, 705, 795 (4 credit hours), 799 (4 credit hours).
4. Mechanical Engineering: 561, 730, 760
5. Math: 425-426, 525-526, or 527-528
6. Computer Science: CS 410
7. Electives in Option: Three courses selected from MATH 646, ME 731, 761, 762, 763, 795, PHYS 718
8. Chemistry: 403-404 or 405
T he School of Health and Human Services, established in 1968, was created in response to the growing need for programs in higher education that prepare young men and women for health-related careers. The school offers undergraduate instruction leading to the bachelor of science degree in communication sciences and disorders, family studies, health management and policy, kinesiology, nursing, occupational therapy, recreation management and policy, and social work. Each program enables students to acquire the basic knowledge and skills needed to practice their chosen professions and to obtain a broad cultural background in the humanities and social sciences.

**Degree Requirements**
Candidates for the B.S. and B.A. degree must satisfy all general education requirements for graduation (page 16), earn at least 128 credits, successfully complete the courses required in one of the curricula described in this section, and achieve the required minimum grade-point average in the chosen curriculum.

*Minors:* See University Academic Requirements page 16; also see Degrees and Major Programs of Study, page 21.  
*Dual-Degree Programs:* See page 18.  
*Student-Designed Majors:* See page 114.  
*Second Majors:* See page 19.

**Undeclared Major**
A limited number of well-qualified freshmen who have expressed an interest in a health-related career, but who are undecided about a specific major may enter the School of Health and Human Services as undeclared students. Undeclared students should explore possible majors by selecting courses from the following:

**Required Courses**
- ENGL 401, Freshman English
- PSYC 401, Introduction to Psychology
- ZOOL 507-508, Human Anatomy and Physiology

**Exploration Courses**
- COMM 520, Survey of Communication Disorders
- FS 525, Human Development
- HMP 401, U.S. Health Care Systems
- KIN 500, Historical and Contemporary Issues in Physical Education
- KIN 585, Emergency First Responder
- NUTR 400, Nutrition Health and Well Being
- RMP 490, Recreation and Leisure in Society
- SW 424, Introduction to Social Work

All SHHS undeclared students are advised by a professional academic counselor. Upon declaration of a specific major, each student is assigned to a faculty adviser within the major department.

**Student Liability Insurance**
All students whose programs require participation in clinical learning internships must purchase and maintain liability insurance for the entire clinical experience. The University has arranged for appropriate insurance coverage at a modest cost to students. Further information may be obtained at major department offices.

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**Programs of Study**

**Communication Sciences and Disorders (COMM)**
www.shhs.unh.edu/csd/
(For course descriptions, see page 165.)

*Chairperson:* Stephen N. Calculator  
*Professor:* Stephen N. Calculator  
*Associate Professors:* Steven P. Bornstein, Frederick C. Lewis, Penelope E. Webster  
*Clinical Associate Professors:* Jeanne H. O'Sullivan, Ruth E. Peaper, Amy S. Plante  
*Assistant Professors:* Michael Fraas, Sheryl Gottwald  
*Research Assistant Professor:* Rac M. Sonnenmeier  
*Clinical Assistant Professor:* Mary Jane Sullivan  
*Lecturer:* Pamela E. Brodor  
*Instructor:* Timothy Bryant

Communication sciences and disorders is the profession devoted to helping people overcome disabilities of speech, language, or hearing. The study of communication sciences and disorders may begin in the
freshman or sophomore year. Students learn about speech, language, and hearing disorders in the classroom and are involved in clinical observation in the on-campus Speech-Language-Hearing Center. Students are encouraged to take elective courses in linguistics, human development, learning theory, early childhood, health administration, special education, and various aspects of rehabilitation.

Students are advised to continue their professional education at colleges or universities offering graduate programs leading to a master's degree and to subsequent certification by the American Speech-Language-Hearing Association. Certified clinicians find employment opportunities in hospitals, schools, community speech and hearing clinics, and private practice.

The required courses in communication sciences and disorders which all students in the program must successfully complete are COMM 520, Survey of Communication Disorders; COMM 521, Anatomy and Physiology of the Speech and Hearing Mechanism; COMM 522, The Acquisition of Language; COMM 524, Clinical Phonetics; COMM 630, Organic Pathologies; COMM 631, Articulation and Language Disorders in Children; COMM 635, Professional Issues in Speech-Language Pathology; COMM 704, Basic Audiometry; COMM 705, Introduction to Auditory Perception and Aural Rehabilitation; and COMM 777, Speech and Hearing Science. Students must also complete KIN 706, Neurology, and a course in statistics. Other elective courses are available.

Students must have a grade-point average of 2.75 at the end of their sophomore year to continue in the major. A 2.75 grade-point average is also required to transfer into the major. Students interested in this program should consult with the chairperson, Stephen N. Calculator.

Minor in Deaf and Hard of Hearing Studies

The minor in Deaf and Hard of Hearing Studies is intended to provide students with courses leading to specialized knowledge related to the fields of deafness and hearing loss. It will be of interest to students who intend to engage in teaching, counseling, rehabilitation, social work, and other professions in which contact with individuals who are deaf or hard of hearing may be expected. There may be some interest as well on the part of students majoring in TESOL and linguistics due to the bilingual aspect of part of the field study. (Individuals whose native language is American Sign Language (ASL) receive instruction in English as a second language.) Finally, it will be a good option for those students who wish to move on to graduate study in the fields of deaf education, rehabilitation counseling, speech-language pathology, and audiology.

Curriculum and Requirements

The minor in Deaf and Hard of Hearing Studies will require the following for a minimum of 20 credits:

1. COMM 533 American Sign Language I
2. COMM 537 American Sign Language II
3. COMM 536 Introduction to Deaf Studies
4. Two electives from the following list:
   - COMM 537 Deaf Culture
   - COMM 734 American Sign Language III
   - COMM 735 American Sign Language IV
   - COMM 704 Audiology*
   - COMM 705 Auditory Perception and Aural Rehabilitation*
   - COMM 779 Internship in Deaf/Hard of Hearing Studies
   - COMM 522 Acquisition of Language*

* required of CSD majors

Communication Sciences and Disorders majors may not use a course required of their major to fulfill both major and minor requirements.

Students in the minor must earn a grade of C- in each course in order to receive credit for the course in the minor. A maximum of 8 credits will be accepted in transfer.

Family Studies (FS)

www.shhs.unh.edu/fs/

(For course descriptions, see page 183.)

Chairperson: Elizabeth M. Dolan
Associate Professors: Kristine M. Baber, Elizabeth M. Dolan, Barbara R. Frankel, Michael F. Kalinowski, Kerry Kazura, John W. Nimmo, Corinna Jenkins Tucker
Assistant Professors: Dora Wu Chen, Mark D. Moses
Extension Educators: Charlotte W. Cross, Suzann E. Knight

Adjunct Faculty: Molly Connelly, Helen Fitzgerald, Valerie Hurst, Charles Putnam, Chuck Rhodes, Jane Stapleton

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, to providing an educational environment that stresses excellence and innovation, and to developing exemplary programs to serve both students and the larger community.

Students learn about families through integration of developmental, theoretical, and empirical information. The department offers a B.S. degree in family studies. Each student selects from one of the four specializations, each offering unique opportunities. Students prepare for positions in family service organizations, educational settings and programs, corporations, and government agencies. Each specialization has entry-level criteria and specific course requirements. All require close consultation with a faculty adviser. Any changes or updates are posted on our Web site.

The nursery/Kindergarten teaching certification and the Certified Family Life Educator programs are highly structured and may have limited enrollment. Acceptance to these programs and to internships and practica is restricted to students demonstrating exceptional potential for working with children and families.

Major Requirements

Core courses required of each family studies major are: FS 525, Human Development and FS 545, Family Relations. A minimum of nine family studies courses is required, at least two of which must be at the 700 level. Twenty credits of supporting coursework are selected in consultation with the adviser. These courses must be 500 level or above and must include at least 12 credits in courses outside the department. Each specialization has required or recommended supporting courses. Some departmental specializations may specify general education courses because they enhance the plan of study. Family studies majors are required to complete an undergraduate statistics course.

Child Advocacy and Family Policy Specialization

This specialization focuses on analyzing and solving problems related to children and their families with a primary emphasis on unmet needs. The goal is for students to complete their degree with a detailed understanding of human development, family relations, educational and government initiatives and regulations, cultural differences, statistics, politics, and effective communication strategies. The specialization is designed to prepare students for entry-level positions as advocates or policy generalists, or to pursue a graduate degree.
Department Requirements
FS 525, Human Development
FS 545, Family Relations
FS 553, Personal and Family Finance for Family Life Educators, or
FS 653, Family Economics
FS 623, Developmental Perspectives on Infancy and Early Childhood, or
FS 624, Developmental Perspectives on Adolescence and Early Adulthood
FS 641, Parenting Across the Lifespan, or
FS 743, Families, Schools and Community, or
FS 760, Family Programs and Policies
FS 746, Human Sexuality, or
FS 750, Contemporary Issues in Adolescent Development, or
FS 757, Race, Class, Gender and Families
FS 772, Child Advocacy
FS 773, International Perspectives on Families and Young Children
FS 794, Families and the Law
FS 710 Child Advocacy and Family Policy
FS 712, Child Advocacy and Family Policy Internship
FS 714, Seminar for Child Advocacy and Family Policy Interns

Supporting Courses
ENGL 503 or ENGL 621, ANTH 516 or ANTH 517, SW 705 or PSYC 581, EDUC 500 or FS 635 or FS 776

Young Child Specialization/Nursery-Kindergarten Teaching Certification
This concentration is for those who have a broad interest in working with young children ranging in age from birth to age eight. This specialization has four major foci that include child development, teaching methodology and curriculum development, developmentally appropriate learning environments for young children, and homeschool-community relations.

The nursery-kindergarten certification (N/K) is a highly competitive program within the young child specialization. Students who qualify and who are accepted into the program will participate in student teaching in their senior year. Applications to the N/K program are completed by students during the fall of the junior year.

Department Requirements
FS 525, Human Development*
FS 545, Family Relations*
FS 623, Developmental Perspectives on Infancy and Early Childhood*
FS 635, Teaching and Learning in Early Childhood Settings*
FS 708-709, Advanced Child Development Internship*
FS 723, Supervising Programs for Young Children*
FS 734, Curriculum for Young Children*
FS 743, Families, Schools and Community*
FS 771, Observation and Assessment*

Students accepted into the certification program must also enroll in the following courses during their senior year:
FS 785, Seminar for Student Teachers*
FS 786, Seminar for Student Teachers*
FS 788, Student Teaching of Young Children*

Supporting Courses
EDUC 500* (may substitute FS 708 or FS 709); THDA 583* or 621; PSYC 581; KIN 600* or 675; MATH 601* or EDUC 741; FS 760, 772, 773, 794, 797 (Families in Poverty); EDUC 706*, 733, 734, 750, 751, 760*.

*These courses are required for nursery/Kindergarten certification.

Family Support/Provisional Certification Family Life Education
This specialization is for students interested in working with children, adolescents, and adults either as individuals or as families. Students develop knowledge and skills to prepare them to provide family support, direct services, and family life education. This specialization prepares students to work in human service settings. Students may choose a plan of study leading to a provisional certification as a family life educator.

The National Council on Family Relations has approved the Department of Family Studies undergraduate program as meeting the standards and criteria required for the Provisional Certified Family Life Educator (CFLE) designation. Certified family life educators work in a variety of settings including social services, health services, child care, family support, youth programs, parent education, junior and senior high schools, and universities and colleges. The designation recognizes expertise in a broad range of issues that constitute family life education and increases credibility by validating the individual's education and experience.

Department Requirements
FS 525, Human Development*
FS 545, Family Relations*
FS 623, Developmental Perspectives on Infancy and Early Childhood*
FS 624, Developmental Perspectives on Adolescence and Early Adulthood
FS 772, International Approaches to Child Advocacy, or
FS 773, International Perspectives on Children and Families

Students accepted into the CFLE Program must also take:
FS 782, Family Internship*
FS 792, Seminar for Family Interns*

Supporting Courses
Gerontology Minor
FS 750, Contemporary Issues in Adolescent Development
Research Methods course (e.g., PSYC 502)
FS 776, Children, Adolescents, and the Law
NURS 535; PSYC 552, 582; SOC 525, 540, 675; SW 524, 525, 697A, 697B, 697C; CMN 530 or PSYC 762.

*These courses are required for the Certified Family Life Educator designation.

Individual and Family Development Specialization
This specialization is for students with a broad interest in working with families. This specialization provides knowledge about specific life stages of individuals within the context of family systems with a focus on system dynamics, diverse family systems, gender, and cultural differences. This plan of study is designed particularly for those expecting to attend graduate school and those who desire a general background in lifespan development and family dynamics.

Department Requirements
FS 525, Human Development
FS 545, Family Relations
FS 623, Developmental Perspectives on Infancy and Early Childhood
FS 624, Developmental Perspectives on Adolescence and Early Adulthood
FS 641, Parenting Across the Lifespan
FS 653, Family Economics
FS 746, Human Sexuality
FS 757, Race, Class and Gender
FS 794, Families and the Law

Supporting Courses
FS 750, Contemporary Issues in Adolescent Development
FS 760, Family Programs and Policies
FS 782, Family Internship
FS 792, Family Internship Seminar
Research Methods course (e.g., PSYC 502, Research Methods in Psychology)
PSYC 552, 581, 582
NURS 535
SOC 540
A foreign language
Work with the Institute on Disability

Family Internships
Internship students will apply knowledge gained from their academic studies in a supervised environment. The internship involves a commitment of fifteen hours per week for two semesters, plus a three-hour
Adolescence Minor

Youth Development. The minor is designed to provide students an opportunity from collaborating departments. In order for a wide array of more specialized offerings to be supervised. Individual course grades must be C or above and the overall grade-point average for the 20 credits must be at least 2.00. Students desiring a minor in family studies are advised to consult with the departmental administrative manager as early as possible.

Family Studies Minor

The department offers a minor to interested students in related majors. Minor requirements include FS 525, FS 545, and three additional courses chosen in consultation with a departmental adviser. Individual course grades must be C or above and the overall grade-point average for the 20 credits must be at least 2.00. Students desiring a minor in family studies are advised to consult with the departmental administrative manager as early as possible.

Child Life Minor

The interdisciplinary minor is offered by the Department of Family Studies and the Therapeutic Recreation Option in the Department of Recreation Management and Policy. Upon completion of course requirements, students will be able to sit for the Child Life Specialist exam. Family studies majors are required to take three core courses: RMP 502, FS 525, and FS 623. FS students will select two courses from the following: RMP 501, RMP 503, RMP 504, RMP 603, RMP 604. Students will complete an Internship which will entail a minimum of 480 hours of experience and be supervised by a certified Child Life Specialist. Family studies majors will be assigned a minor adviser from therapeutic recreation.

Adolescence Minor

The UNH Center on Adolescence, in conjunction with the Departments of Family Studies and Recreation Management and Policy, offers a minor in Adolescent and Youth Development. The minor is designed to provide students an opportunity to develop knowledge and skills regarding adolescence and youth development. Required courses offer a foundation in theory, research, and practice for all minors. Students select three additional courses from a wide array of more specialized offerings from collaborating departments. In order that students may be assisted in developing a cohesive plan of study for their minor, a simple application process will be used.

Only students who have submitted an application, been accepted into the minor, and have completed the required coursework will be identified as having achieved a minor in Adolescent and Youth Development. Students will select two courses from: FS 624, Developmental Perspectives on Adolescence and Early Adulthood; FS 750, Contemporary Issues in Adolescent Development; RMP 668, Youth Culture and Programs. Students will select three electives from: EDUC 710c, Youth Organizations; EDUC 797, Seminar in Early Adolescent Development; EDUC 717, Growing Up Male in America; EDUC 735, Young Adult Literature; FS 797, Adolescent Males and Violence; KIN 565, Principles of Coaching; RMP 558, Program Supervision and Leadership; RMP 560, Recreational Sport Management; RMP 730, Camp Administration and Leadership; RMP 760, Community Sport Organizations: Administration and Development; SOC 525, Juvenile Crime and Delinquency; SOC 773, Sociology of Childhood; RMP 563 or FS 707, Practicum; EDUC 507, Mentoring Adolescents.

Health Management and Policy (HMP)

www.shhs.unh.edu/hmp/

(For course descriptions, see page 189.)

Chairperson: James B. Lewis

Professors: Cynthia M. Duncan, James F. McCarthy, Jeffrey Colman Salloway, John W. Seavey, Lee F. Seidel, Robert S. Woodward

Clinical Professors: Edgar J. Helms, Jr., Leslie N.H. MacLeod

Associate Professors: Rosemary M. Caron, Marc D. Hiller, James B. Lewis

Assistant Professor: Robert J. McGrath

Research Assistant Professor: David J. LaFlamme

Clinical Assistant Professor: Susan W. Fox

Undergraduates majoring in the health management and policy program are prepared to embark upon management careers in a wide range of health care delivery and financing organizations, public health, and health policy. Graduates work in many settings, including health care delivery systems, hospitals, nursing homes, health maintenance and other managed care organizations, public health departments, community-based and home-health agencies, mental health facilities, regulatory bodies, consulting companies, and insurance companies.

The academic program is interdisciplinary, with undergraduates taking courses in many academic units of the University. Students gain a broad view of health and health care while developing analytical skills in health care management and policy. The department uses a computer laboratory that is integrated throughout the curriculum.

The department's undergraduate program maintains full certification by the Association of University Programs in Health Administration (AUPHA). Students have the opportunity to become student members in the American College of Healthcare Executives and the American College of Health Care Administrators, both of which are represented by student chapters at the University. There is also an organization for students interested in public health issues. The department curriculum is approved under the New England Regional Student Program.

Academic Program

Competencies are achieved through three components of the curriculum:

University general education requirements, HMP collateral courses, and the HMP core courses including a field practicum. Students work closely with their assigned faculty advisers to develop a plan of study to achieve completion of each of these components. Upper division HMP courses are sequenced in a two-year progression as described in departmental handouts to all majors. Students are expected to follow this sequence; any exceptions are made by petition. Late transfers may have to plan for an extra year. Several upper-division HMP elective courses are available.

University General Education Requirements:

Advisers assist students in selecting courses that satisfy certain program expectations and simultaneously meet University general education requirements.

HMP-Required Collateral Courses:

A basic understanding is expected in each of the following areas related to health management and policy: 1) microeconomics, 2) organizational behavior, and 3) statistics. HMP faculty advisers work with students to select the appropriate courses to fulfill these requirements. Students are advised to complete their collateral coursework prior to their junior year in the major. Program-approved courses in organizational behavior, statistics, microeconomics, Epidemiology (HMP 501), Health Management and Policy Critical Issues (HMP 402), and U.S. Health Care Systems (HMP 401) must have been completed successfully before a student may begin junior-level studies in the major.

HMP Core Courses:

In general, each of the following courses must be completed by HMP majors prior to graduation.


Upper-division courses include HMP 642, Health Economics; HMP 711, Health Systems Research I; HMP 712, Health Systems Research II; HMP 721, Managing Health Care Organizations; HMP 723, Health Planning; HMP 740, Health Care
Financial Management; HMP 742, Strategic Management for Health Care Organizations or HMP 748, Health Policy Analysis; HMP 744, Ethical Issues in Health Management and Medicine; and HMP 746, Health Policy. Upper-division courses are not offered every semester and students progress through these courses in a sequential order.

Field Practicum:
A full-time practicum (or administrative internship) that integrates class work with a supervised managerial work experience constitutes an essential part of the academic program. It allows students to explore an area of special interest in depth. Courses comprising this component of the major include: HMP 621, Prepracticum Seminar; HMP 622, Field Practicum; and HMP 624, Post Practicum Seminar. The practicum is divided into three concurrent components: A. Field Practicum Organizational Analysis; B. Field Practicum Management Skills Development; and C. Field Practicum Project Analysis. Field practicum sites are selected by faculty with student involvement and are concentrated in central and northern New England. Given sufficient timing of student requests, efforts will be made to arrange practice at distant sites based on special needs.

HMP field practica currently occur during the summer between the junior and senior year within the curriculum. They begin in late May and end in late August and require a full-time commitment.

HMP Elective Courses:
Elective courses within the program may include: HMP 430, Alternative Medicine and Health; HMP 505, Public Health: History and Practice; HMP 569, Human Behavior and the Public Health; HMP 570, Social Marketing; HMP 730, Managed Care; HMP 734, Health Law; HMP 750, Comparative Health Care Systems; and HMP 755, Long Term Care Management and Policy. In addition, seniors may have the opportunity to elect independent studies (HMP 796) through individual arrangements with HMP faculty. Majors are encouraged to enroll in one or more of these courses before graduation.

Academic Requirements:
HMP majors must obtain a minimum of a C- in all HMP core courses and must pass all HMP-required collateral courses. Majors must have an overall grade-point average of 2.50 by the end of the semester preceding their practicum. Students not maintaining an overall grade-point average of 2.50 are reevaluated by the faculty and may be counseled into another major at the University.

The faculty reviews student performances during the semester before the practicum to determine each student's readiness. Students who do not successfully complete prerequisite courses may not be permitted to advance through subsequent courses in the major.

Applications for Major
Students interested in additional information or in applying for admission to the health management and policy major should contact the department's director of undergraduate studies. Students seeking internal transfer into the major must complete an internal transfer application form. Efforts should be made to complete this process during the freshman year or early in the sophomore year to ensure sufficient time to complete all of the required collateral courses as well as those in the major in a timely manner.

Honors in Major
The department offers an honors in major program. To qualify, students must meet the department's requirement of having an overall 3.20 grade-point average at UNH and a 3.30 grade-point average for required HMP courses taken by the end of the junior year. Honors in major students take honors courses during the last half of junior year and senior year as well as complete an honors project. Students work with a faculty member in the department in the development of the honors project. Students should contact the department's honors in major adviser for further information.

Health Management Minor
The department offers an integrated minor in health management designed for students majoring in clinically oriented professional programs offered through other departments in the School of Health and Human Services. Students not enrolled in the school who wish to minor in health management may inquire about doing so by contacting the department's director of undergraduate studies. Students accepted into the minor must complete: 1) three required courses (HMP 401, U.S. Health Care Systems; HMP 721, Managing Health Care Organizations; and HMP 710, Financial Management for Clinicians); 2) one HMP elective course (HMP 501, Epidemiology and Community Medicine; HMP 430, Alternative Medicine and Health; HMP 505, Public Health History and Practice; HMP 569, Human Behavior and the Public Health; HMP 642 Health Economics; HMP 744, Ethical Issues in Health Management and Medicine; or HMP 755, Long Term Care Management and Policy); and 3) one additional elective course from a list approved by the department. Students seeking to minor in health management must complete the application available in the department office and meet with the department's director of undergraduate studies before commencing the minor.

Public Health Minor
The Department of Health Management and Policy also offers a minor in public health. Public health deals with the health of populations and focuses on health promotion and disease prevention as well as access to the medical system. Public health is interdisciplinary in nature and, therefore, the minor is composed of courses in the Department of Health Management and Policy as well as courses in other schools and colleges in the University.

The interdisciplinary public health minor is comprised of 20 credits. The minor will provide students with an introduction to many of the foundation areas of public health. It will provide students with a basic exposure to key concepts and skills in the five core disciplines of public health, as articulated by the Council on Education for Public Health. The core courses are biostatistics, epidemiology, environmental health sciences, health services administration, and social and behavioral sciences. All students will be required to complete four courses: HMP 401, US Health Care Systems; HMP 501, Epidemiology; HMP 505, Public Health: History & Practice; and HMP 569, Behavior and Public Health. The elective courses available to students include offerings from a variety of schools and departments at UNH.

The minor is open to any baccalaureate student at UNH. Students majoring in Health Management and Policy will not be able to receive credit toward the minor for courses taken to fulfill a requirement of the major.

Public Health Option
This option was approved in 2005 and provides students with the knowledge and skills for entry-level positions within the public health agencies/workforce. The public health field is emerging as a key area for the protection of population health. It provides students with an introduction to many of the foundation areas of public health and gives basic exposure to key concepts and skills in the five core disciplines of public health as articulated by the Council on Education for Public Health. The core courses are biostatistics, epidemiology, environmental health sciences, health services administration, and social and behavioral sciences.
In addition to the core courses, students will be required to take course work in two additional elective areas; one course from offerings in Public and Environmental Health and an additional elective from the offerings in either nutrition and public health or mechanisms of infectious and chronic disease in public health. The list of elective courses available is substantial and includes offerings from a variety of schools and departments at UNH. There are multiple traditional areas of public health practice: public health and the environment, nutrition and public health, behavioral modification and infectious and chronic diseases.

The Public Health option at UNH is one of the few programs at the undergraduate level available nationally.

Required Courses

- ECON 401 or 402, Micro or Macro Economics
- HMP 401, US Health Care Systems
- HHS 540 or equivalent in Statistics
- HMP 402, HMP Critical Issues
- HMP 501, Epidemiology
- HMP 702, Quantitative and Research Methods in Epidemiology
- HMP 505, History of Public Health
- HMP 569, Public Health and Human Behavior
- HMP 740, Health Care Financial Management
- HMP 621, Pre-Practicum
- HMP 712, Health Systems Research
- HMP 642, Health Economics
- HMP 723, Health Planning
- HMP 622, Field Practicum (Summer session junior year)
- HMP 624, Post Practicum 2 cr.
- HMP 744, Ethical Issues
- HMP 746, Health Policy
- HMP 748, Health Policy Analysis

International Affairs (dual major)

(For program description, see page 111.)

Kinesiology (KIN)

www.unh.edu/kinesiology/

(For course descriptions, see page 200.)

Chairperson: Michael A. Gass

Professors: Ronald V. Croce, Michael A. Gass, Stephen H. Hardy

Associate Professors: Heather Barber, Robert W. Kenefick, John P. Miller, Timothy J. Quinn, Erik E. Swartz, Neil B. Vroman, Steven C. Wright

Clinical Associate Professor: Daniel R. Sedory

Assistant Professors: Brent Bell, Karen E. Collins, Michelle A. Grenier, Jayson O. Seaman

Clinical Assistant Professors: Laurie Gullion, Kenneth T. Hult, Pam McPhee, Allison Sigler, Virginia Logan Westmoreland

Instructors: Karen N. Henny

Lecturer: Thomas W. Ashwell

The mission of the Department of Kinesiology is to generate, transmit, and apply knowledge about the role of physical activity (including exercise, movement, outdoor adventure experiences, and sport) in the advancement of health in society. The department has several teaching, research, and service functions that support this mission, including the preparation of professionals in five options. While options vary in emphasis, each curriculum offers students fundamental knowledge in the following areas: the biological, psychological, and sociocultural foundations and consequences of physical activity; the pedagogical and rehabilitative aspects of physical activity; and the management and marketing of delivery systems in the field. Each option makes extensive use of field experiences and internships that blend theory with practice.

The department offers five areas of study for majors: 1) athletic training, 2) exercise science, 3) outdoor education, 4) sport studies, and 5) physical education pedagogy. Students who wish to minor in kinesiology must complete 20 credits of coursework that have been approved by a department minor adviser. No more than 6 of the 20 credits may be earned through activity or coaching courses.

Students interested in majoring or minoring in kinesiology should consult with the specific option coordinator.

Athletic Training Option

An athletic trainer implements injury prevention programs and immediate treatment and rehabilitation procedures for injured individuals as directed by physicians. The Commission on Accreditation of Athletic Training Education (CAATE)-accredited athletic training option prepares professionals qualified to attend the athlete, the fitness-conscious jogger, the skilled professional athlete, or anyone engaged in physical activity.

Students take coursework in prevention, evaluation, management, care, and rehabilitation of injuries as well as administration, education, and counseling. Students must earn a grade of C (2.00) or better in all KIN required courses and ZOOL 507-508.

Students gain clinical experience in University athletic training rooms and at off-campus clinical sites. Successful completion of the entire program, including 1,000 hours of supervised clinical experience, qualifies students to take the BOC certification exam. Students who wish to pursue both BOC certification and public school teacher certification should also see the pedagogy option. This double course of study will require between five and six years.

Students are admitted to the University in the athletic training option with conditional status. Specific criteria must be met during the student's first year before he/she may apply for full-time status in the option, which is awarded to those students demonstrating exemplary performance in classes and clinical observations. Additionally, option technical standards establish the qualities considered necessary for students to achieve the knowledge, skills, and competencies associated with the program. Candidates for full-time status will be required to verify they understand and meet these technical standards or that, with reasonable accommodations, they can meet the standards. It is very important that interested students consult with option coordinator, Dan Sedory, regarding entry criteria and the technical standards.

Required Courses

KIN 506, Concepts of Athletic Training 4
KIN 507, Concepts of Athletic Training Lab 1
KIN 585, Emergency First Responder 4
KIN 620, Physiology of Exercise 4
KIN 652, Clinical Kinesiology 3
KIN 653A, Musculoskeletal Assessment 2
KIN 658, Evaluation & Care of Athletic Training Injury I 4
KIN 658L, Evaluation & Care of Athletic Training Injury Lab 1
KIN 659, Evaluation & Care of Athletic Training Injury II 4
KIN 659L, Evaluation & Care of Athletic Training Injury II Lab 1
KIN 660, Therapeutic Exercise in Athletic Training 4
KIN 661, Therapeutic Exercise Lab 1
KIN 662, Therapeutic Modalities in Athletic Training 4
KIN 663, Therapeutic Modalities Lab 1
KIN 665, Laboratory Practicum in Athletic Training 4
KIN 665A, Level I 2
KIN 665B, Level II 2
KIN 665C, Level III 2
KIN 665D, Level IV 2
KIN 655, Laboratory Practicum in Athletic Training 2
KIN 665E, Level V 2
KIN 667, Pharmacology in Athletic Training 2
KIN 670, General Medical Conditions in Athletics 4
KIN 710, Organization/Administration of Athletic Training Programs 4
KIN 715, Seminar in Athletic Training 4
KIN 718, Career Preparation in Athletic Training 4
KIN 780, Psychological Factors in Sport 4

University Required Courses

NUTR 400, Nutrition in Health and Well Being 4
PSYC 401, Introduction to Psychology 4
Statistics Course 4
ZOOL 507-508, Human Anatomy and Physiology 8

SCHOOL OF HEALTH AND HUMAN SERVICES
Exercise Science Option

This curriculum prepares individuals for career opportunities in fitness and health promotion programs in hospitals, industry, and communities. Exercise scientists work in physical activity programs of prevention, intervention, and rehabilitation. Students must earn a grade of C (2.00) or better in every required course. All required courses must be completed before enrolling in KIN 650. Interested students should consult with the option coordinator, Timothy J. Quinn.

Required Courses

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 585, Emergency First Responder</td>
<td>4</td>
</tr>
<tr>
<td>KIN 620, Physiology of Exercise</td>
<td>4</td>
</tr>
<tr>
<td>KIN 621, Exercise Laboratory Techniques</td>
<td>4</td>
</tr>
<tr>
<td>KIN 650, Exercise Science Internship</td>
<td>8</td>
</tr>
<tr>
<td>KIN 652, Clinical Kinesiology</td>
<td>4</td>
</tr>
<tr>
<td>KIN 653A, Musculoskeletal Assessment</td>
<td>2</td>
</tr>
<tr>
<td>KIN 704, Electrocardiography</td>
<td>4</td>
</tr>
<tr>
<td>KIN 705, Topics in Applied Physiology</td>
<td>4</td>
</tr>
<tr>
<td>KIN 720, Science and Practice of Strength Training</td>
<td>4</td>
</tr>
<tr>
<td>KIN 724, Metabolic Adaptations to Exercise</td>
<td>4</td>
</tr>
<tr>
<td>KIN 736, Fitness and Graded Exercise Testing</td>
<td>4</td>
</tr>
<tr>
<td>KIN 737, Exercise Prescription and Leadership</td>
<td>4</td>
</tr>
<tr>
<td>KIN 794, Cardiopulmonary Pathologies</td>
<td>4</td>
</tr>
<tr>
<td>KIN 795, Practicum in Cardiac Rehabilitation</td>
<td>2</td>
</tr>
</tbody>
</table>

University Required Courses

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUTR 400, Nutrition in Health and Well Being</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 401, Introduction to Psychology</td>
<td>4</td>
</tr>
<tr>
<td>ZOOL 507-508, Human Anatomy and Physiology</td>
<td>8</td>
</tr>
</tbody>
</table>

One course chosen from

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 502, PSYC 402, or HHS 540</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 403-404, General Chemistry</td>
<td>8</td>
</tr>
<tr>
<td>CS 403, Online Network Applications</td>
<td>4</td>
</tr>
</tbody>
</table>

Outdoor Education Option

The outdoor education option is an award-winning, internationally recognized program preparing individuals for careers in the educational, managerial, and/or therapeutic aspects of physical activity in natural and challenging environments. The option is interdisciplinary in scope, uses the various natural resources in seacoast and mountain areas, and provides students ample opportunity for practical application and field experience. Students must earn a grade of C (2.00) or better in every required course. In addition they must complete 100 days of documented leadership experience prior to beginning an internship. Interested undergraduate students should consult with the undergraduate curriculum coordinator, Laurie Gullion, e-mail lgullion@unh.edu.

Required Courses

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 540, Top Rope Rock Climbing</td>
<td>3</td>
</tr>
<tr>
<td>KIN 541, Management of Challenge Course</td>
<td>4</td>
</tr>
<tr>
<td>KIN 543, Winter Backpacking Skills</td>
<td>2</td>
</tr>
<tr>
<td>KIN 550, Outdoor Education Philosophy and Methods</td>
<td>4</td>
</tr>
<tr>
<td>KIN 551, Adventure Programming: Backcountry Based Experiences</td>
<td>3</td>
</tr>
<tr>
<td>KIN 552, Adventure Programming: Water-Based Experiences</td>
<td>3</td>
</tr>
<tr>
<td>KIN 681, Theory of Adventure Education</td>
<td>4</td>
</tr>
<tr>
<td>KIN 682, Outdoor Leadership</td>
<td>4</td>
</tr>
<tr>
<td>KIN 684, Emergency Medical Care: Principles/Practices</td>
<td>3</td>
</tr>
<tr>
<td>KIN 685, Emergency Medical Care: Principles/Practices Lab</td>
<td>2</td>
</tr>
<tr>
<td>KIN 686, Wilderness Emergency Medical Care</td>
<td>4</td>
</tr>
<tr>
<td>KIN 687, Leadership Practicum</td>
<td>4</td>
</tr>
<tr>
<td>KIN 784, Organization/Administration of Outdoor Education</td>
<td>4</td>
</tr>
<tr>
<td>KIN 650, Internship* (2-4 Cr/F)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Proof of 100 days of leadership experience is required prior to taking this course.

Elective Courses (must successfully complete at least one)

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 545, High Angle Rescue</td>
<td>2</td>
</tr>
<tr>
<td>KIN 546, Whitewater Canoeing</td>
<td>3</td>
</tr>
<tr>
<td>KIN 547, Lead Rock Climbing</td>
<td>3</td>
</tr>
<tr>
<td>KIN 548, High Altitude Mountaineering</td>
<td>4</td>
</tr>
<tr>
<td>KIN 549, Wilderness Programming Skills</td>
<td>4-8</td>
</tr>
<tr>
<td>KIN 782, Therapeutic Applications of Adventure Programming</td>
<td>4</td>
</tr>
<tr>
<td>KIN 693C, Teaching Assistantship</td>
<td>(2-4 Cr/F)</td>
</tr>
</tbody>
</table>

University Required Courses

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 501, Introduction to Prose Writing</td>
<td>4</td>
</tr>
</tbody>
</table>

Other: Core of courses emphasizing the particular area or population in outdoor education of interest to student, e.g., business, education, psychology-selected with assistance of an adviser.

Sport Studies Option

Sport studies is an interdisciplinary option in the Department of Kinesiology that provides a foundation for a variety of career paths in school and college athletics, including coaching, administration, marketing, and sports information. The major also prepares students for further graduate study in areas such as sport psychology. Some sport studies courses are appropriate for students with career interests in other industry segments (e.g., pro-sports, broadcasting), but those students must choose other majors (e.g., business or journalism). Students take a core of foundation courses (e.g., The Sport Industry) as well as electives in applied areas such as sport marketing, athletic administration, and sport psychology. Majors must earn a grade of B- (2.67) or better in KIN 655 and KIN 580 and a grade of C (2.0) or better in each required University and KIN course. Cognate courses are required in supporting areas such as business, psychology, or in any other approved areas. In addition, an internship experience or independent study is required. An internship experience is strongly recommended since it is often critical to career development. Interested students should consult with the option coordinator, Stephen Hardy.

Required Courses

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 560, Sport Psychology</td>
<td>4</td>
</tr>
<tr>
<td>KIN 562, Introduction to Sports Information</td>
<td>4</td>
</tr>
<tr>
<td>KIN 565, Principles of Coaching</td>
<td>4</td>
</tr>
<tr>
<td>KIN 580, The Sport Industry</td>
<td>4</td>
</tr>
<tr>
<td>KIN 741, Social Issues in Contemporary Sports</td>
<td>4</td>
</tr>
<tr>
<td>KIN 761, Senior Seminar in Sport Studies</td>
<td>4</td>
</tr>
</tbody>
</table>

Electives

Sixteen credits of approved sport studies electives to include KIN 650 or KIN 696.

University Required Courses

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 401, Computer Applications</td>
<td>4</td>
</tr>
<tr>
<td>PSYC 401, Introduction to Psychology</td>
<td>4</td>
</tr>
</tbody>
</table>

One approved statistics course

Cognate Requirement (outside of Department of Kinesiology)

Students must complete a package of cognate courses approved by the faculty (minimum 20 credits).

Physical Education Pedagogy Option

Pedagogy is the art and science of teaching. This option integrates a general education background with the theoretical and process knowledge involved in teaching movement-based elementary and secondary physical education programs. Extensive practicum experiences prepare students to teach preschool children, school-aged youth, and young adults, including students with developmental disabilities.

The physical education pedagogy option provides the foundation for public school teacher certification through either our four-year certification program, or, if a student chooses to pursue a master's degree with certification, the Department of Education's Fifth-Year Program. All fifth-year candidates must meet the requirements for admission to graduate school (e.g., grade-point average of 2.67 or above and 800 or above on the Graduate Record Examination). Internal transfer candidates must have a minimum GPA of 2.67 and pass the Praxis I, state licensure exam before admission to the option. All physical education pedagogy option students must receive a "C" grade (2.0) or better in all KIN required courses, including: KIN 655, Middle School.
and Secondary PE Pedagogy; KIN 666, Middle School and Secondary PE Practicum; KIN 610, Elementary PE Pedagogy; KIN 781, Inclusion in PE; and KIN 570, Elementary PE Practicum. Pedagogy majors are admitted with conditional status. In order to obtain full-time status in the option, majors must pass the Praxis I state licensure exam before classes begin in Fall of their sophomore year and maintain at least a 2.67 overall GPA at the start of their junior year. For questions about this program, contact the option coordinator, Steven Wright, at (603) 862-4408, or e-mail Steven.Wright@unh.edu.

The nursing program is nationally accredited by the Commission on Collegiate Nursing Education, One Dupont Circle NW, Suite 530, Washington, DC 20036-1120. It reflects the mission and goals of the University and focuses on the uniqueness of each individual. The mission of the Department of Nursing is to enhance the health of individuals, families, groups, and communities. The philosophy expresses the beliefs of the faculty regarding person, environment, health, nursing, and education. Its goals are to help nursing students develop knowledge and skills essential to the present and future practice of nursing. Graduates of the program are prepared to provide care to individuals and groups, help people identify and meet their health care needs, be effective colleagues on the health care team, and shape the future of health care.

The curriculum is divided into biological, social sciences, and humanities as a foundation for courses in the major; and nursing courses, which emphasize caring, critical thinking, problem solving, decision making, and developing clinical skills. Clinical experiences are offered in area hospitals and in community health agencies. The senior year culminates in a practicum in which students apply curriculum concepts to an interest area of their choice.

The faculty of the nursing program believe learning is a creative process wherein students are active participants in their education, growth, and development as professional nurses. Faculty members are facilitators and mentors to students within a supportive, scholarly environment.

Honors in major courses are offered to interested nursing students who have achieved a 3.20 minimum cumulative grade-point average and 3.5 in the nursing major. The following prerequisite courses must be completed successfully prior to nursing major course work: ENGL 401; ZOOL 507-508; NUTR 400; and PSYC 401. MICR 501 must be taken prior to or concurrent with NURS 501. A course in statistics must be completed prior to, or taken concurrent with, NURS 645, Nursing Research. Prerequisite courses require grades of C or better and only one prerequisite course may be repeated one time in order to progress in the major.

Most of the prerequisite courses also meet general education requirements. A cumulative grade-point average of 2.50 must be maintained throughout the program. Major courses require a minimum grade of C.

Students are responsible for their own transportation to clinical agencies, uniforms, professional equipment, liability and health insurance coverage, criminal background checks, and identified required immunizations. Additional costs associated with the program include laboratory fees each semester beginning in sophomore year and fees associated with attendance at professional meetings. Students must be certified in cardiopulmonary resuscitation by departmental deadlines. Students will be dropped from the major if documentation is not received by the first day of class.

### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZOOL 507-508, Human Anatomy and Physiology</td>
<td>4</td>
</tr>
<tr>
<td>NUTR 400, Nutrition Health and Well Being</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 401, First-Year Writing</td>
<td>-</td>
</tr>
<tr>
<td>PSYC 401, Introduction to Psychology</td>
<td>-</td>
</tr>
<tr>
<td>Electives (3)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICR 501, Microbes in Human Disease</td>
<td>4</td>
</tr>
<tr>
<td>NURS 501, Introduction to Nursing</td>
<td>4</td>
</tr>
<tr>
<td>One course in statistics*</td>
<td>4</td>
</tr>
<tr>
<td>NURS 502, Concepts of Pathophysiology/Pharmacology</td>
<td>-</td>
</tr>
<tr>
<td>NURS 508, Foundations of Nursing Judgment</td>
<td>-</td>
</tr>
<tr>
<td>NURS 514, Techniques of Clinical Nursing</td>
<td>-</td>
</tr>
<tr>
<td>Electives (2)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 615, Care of the Adult</td>
<td>4</td>
</tr>
<tr>
<td>NURS 615C, Care of the Adult Clinical</td>
<td>4</td>
</tr>
<tr>
<td>NURS 619, Clinical Decision Making I</td>
<td>4</td>
</tr>
<tr>
<td>NURS 620, Caring for the Childbearing-Rearing Family</td>
<td>-</td>
</tr>
<tr>
<td>NURS 620C, Caring for Childbearing-Rearing Family Clinical</td>
<td>-</td>
</tr>
<tr>
<td>or NURS 618, Caring for People w/ Alterations in Mental Health</td>
<td>-</td>
</tr>
<tr>
<td>NURS 618C, Caring for People w/ Alterations in Health Clinical</td>
<td>-</td>
</tr>
<tr>
<td>and NURS 624, Nursing in the Community</td>
<td>-</td>
</tr>
<tr>
<td>NURS 624C, Nursing in the Community Clinical</td>
<td>-</td>
</tr>
<tr>
<td>NURS 622, Clinical Decision Making II</td>
<td>4</td>
</tr>
<tr>
<td>NURS 645 Nursing Research</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 703, Nursing Leadership/Management and the Org. Context</td>
<td>4</td>
</tr>
<tr>
<td>NURS 618, Caring for People w/ Alterations in Mental Health</td>
<td>2</td>
</tr>
<tr>
<td>NURS 618C, Caring for People w/ Alterations in Health Clinical</td>
<td>2</td>
</tr>
<tr>
<td>and NURS 624, Nursing in the Community</td>
<td>2</td>
</tr>
</tbody>
</table>
R.N. Baccalaureate Program

Registered nurses with a valid registered nurse license who meet University admission criteria may pursue, on a full- or part-time basis, a bachelor of science degree with a major in nursing at UNH-Durham, Keene, or at UNH Manchester.

Curriculum requirements may be met through transfer credits, course enrollments, and challenge examinations. An R.N. license and one year of practice experience is preferred for nursing major courses.

The nursing component is based on the belief that R.N. students enter the program with knowledge and competence gained through previous educational and work experiences. This knowledge and competence can be demonstrated through completion of required baccalaureate-level nursing courses. Individualized plans of study are developed to enable completion of nursing content.

The R.N. student must earn a minimum of 128 credits and have a 2.50 cumulative grade-point average in order to enroll in clinical nursing courses and maintain that grade-point average throughout their coursework. A minimum grade of C is required in each nursing course.

Interested R.N.s should consult with the R.N. program coordinator.

Occupational Therapy (OT)

www.shhs.unh.edu/ot/
(For course descriptions, see page 223.)

Chairperson: Elizabeth L. Crepeau
Professor: Elizabeth L. Crepeau
Associate Professors: Lou Ann Griswold, Shelley E. Mullan, Barbara Prudhomme White
Assistant Professors: Susan C. Merrill, Douglas C. Simmons, Kerryellen Vroman
Clinical Assistant Professor: Elizabeth A. Stewart, Kelly E. Thompson, Therese Willkomm

Occupational therapy enables people to participate in daily life activities including leisure, work, self-care, and home management. Occupational therapists work with people of all ages to gain or regain skills and abilities or adapt tasks within their natural environment. Occupational therapy education includes studies in liberal arts, biological, behavioral, and health sciences, and occupational science and occupational therapy.

The occupational therapy program 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 phone 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 a registered occupational therapist (OTR). Most states require licensure in order to practice; however, state licenses are usually based on the results of the NBCOT certification examination.

Combined Bachelor of Science/Master of Science Program

Graduates of professional programs must complete a professional master's degree in occupational therapy in order to enter the field. The University of New Hampshire Department of Occupational Therapy offers a combined bachelor's degree/master's degree program. Students may enter as freshmen or transfer into the B.S./M.S. program at the end of the sophomore year, space permitting in the program. Students interested in transferring into this program should contact the Department of Occupational Therapy for information about transfer requirements and application deadlines.

Pre-Professional Curriculum

Students begin the B.S./M.S. curriculum with three years of pre-professional courses, which include courses in biological and social sciences as well as occupational therapy. In addition to University general education courses, students take the following core courses during their first three years:

ENGL 401, First-Year Writing
PSYC 401, Introduction to Psychology
ZOOI 507 and 508, Human Anatomy and Physiology
Social Sciences: three courses in the social sciences,

such as history, sociology, psychology, economics, anthropology
OT 500, The Behavior and Development of Children
OT 501, Development Tasks of Adulthood
OT 510, Exploring Occupational Therapy and Occupation
OT 685, Psychosocial Disorders and Everyday Life
KIN 706 and 707, Neurology and Neurology Lab

Statistics

Additional requirements include:
an experiential learning course for four credits;
a health or social policy course;
a minor or self-designed concentration area that relates to health and human services for a total of 20 credits;

Professional Curriculum

Students in the B.S./M.S. curriculum begin the professional program in the senior year and complete the following courses:

OT 741, Human Occupation
OT 746, Transitions: Student to Professional
OT 751, Mind Body Systems Neurologically-based Function and Dysfunction
OT 752, Human Movement and Environmental Effects on Everyday Occupations
OT 762, Evaluation Principles and Methods
OT 763, OT Intervention
OT 764, OT Intervention Lab
OT 771, Enabling Participation in Community Groups
OT 772, Occupation, Health and Community Programming
OT 792, Level I Fieldwork

At the end of this year, students are awarded a Bachelor of Science degree in occupational science. Students then apply to the Graduate School as advanced-standing students in the professional master's program. An overall minimum grade point of 3.0 and a minimum of 3.0 G.P.A. in prerequisite courses is required for admission to the master's degree program.

Please refer to the Graduate Catalog for additional information about the master's program and the fifth year of the occupational therapy curriculum including fieldwork requirements.

Students have four academic years to complete the professional curriculum including level II field work. They will then be eligible to sit for the certification examination administered by the National Board of Certification of Occupational Therapists (NBCOT). Consistent with NBCOT, students must sit for the certification examination within two years of completion of coursework and fieldwork. A felony conviction may affect a graduate's ability to sit for the NBCOT certification examination and/or obtain state licensure.

Students are responsible for transportation to off-campus practicum and fieldwork locations and must purchase personal liabil-
ity insurance for coverage for the practical components of the curriculum. Curriculum review and revision is undertaken annually. The Department of Occupational Therapy works closely with students during academic advising sessions and shares information about policy and requirement changes during registration periods as well as throughout the academic year. Students are also expected to take an active role in verifying expectations and should check with their department advisers each September for updated policies and requirements. Program requirements and policies for retention in the major are in the OT Department Policy and Procedure Manual, which is available on Blackboard.

Disabilities Minor
This interdisciplinary minor is offered by several of the Departments in the School of Health and Human Services. The minor will prepare undergraduate students to apply their unique disciplinary skills in an interdisciplinary service delivery environment to work with and support individuals with disabilities and their families to become fully engaged in their communities, achieving independence, and increasing quality of life. The 18 credit curriculum consists of 2 required courses (EDUC 750, HHS 798), 2 elective courses, and a 2 credit independent study.

Recreation Management and Policy (RMP)
www.unh.edu/rmp/index.shtml
(For course descriptions, see page 235.)
Chairperson: Janet R. Sable
Professors: Lou G. Powell, Janet R. Sable
Associate Professors: Robert J. Barcelona, Ann L. Morgan
Assistant Professor: Joshua Carroll
Affiliate Assistant Professor: James Hilton
Clinical Assistant Professors: Patricia J. Craig, Jill Gravink
Clinical Instructors: Tom Carr, David Lee
Senior Instructor: Heather Bowen
Adjunct Faculty: Maryellen Burke, Dennis M. Byrne, Heather Kiley, Cari A. Moorhead, Donna Marie Sorrentino
As the fabric of life in contemporary society grows in complexity, people are increasingly turning to leisure and recreation services to find meaning, renewal, and enrichment. Recreation services can improve the public health, develop a sense of community, and enhance the quality of life of all citizens. Recreation professionals work in diverse settings including human services, health care, natural recreation resource areas such as parks, and commercial recreation businesses. Graduates are employed by community recreation agencies, resorts, conference centers, youth services agencies, hospitals, rehabilitation centers and long-term care facilities. Population and economic projections suggest that recreation service industries will continue to expand and thereby continue to provide numerous professional career opportunities. The Department of Recreation Management and Policy is nationally accredited by the National Recreation and Parks Association/American Association of Leisure and Recreation. The department's curriculum supports a broad-based liberal education and an opportunity to acquire specialized professional knowledge and skills.

Curriculum Structure
Students entering the major may choose either: 1) program administration, which includes the professional core and required courses related to program administration; or 2) therapeutic recreation, which includes the professional core and required courses in therapeutic recreation.

International Study in Recreation and Leisure
A semester abroad sponsored by the American Universities International Program is available to students pursuing a degree in recreation management and policy. Programs in Scotland, Australia, New Zealand, South Africa, or Belize provide discipline-related exchange opportunities. Approval by the curriculum director is required approximately one year before departure. Eleven transfer credits can be granted. Other destinations can be negotiated through the Center for International Education on campus.

Core Courses
All majors must complete a core curriculum of eight courses: RMP 490, Recreation and Leisure in Society; RMP 501, Recreation Services for Individuals with Disabilities; RMP 557, Recreation Services Program Design and Planning; RMP 563, Recreation Management and Policy Practicum; RMP 654, Professional Development and Ethics; RMP 663, Management and Policy in Leisure Services; RMP 664 (A or B), Professional Internship; RMP 724, Grantsmanship, Evaluation, and Research; and RMP 772, Law and Public Policy in Leisure Services.

A supervised internship (RMP 664) is required of all majors. The internship is designed to create a bridge between theory and practical application. Students working with their advisers and the internship coordinator select an appropriate setting based on their professional and career interests. They must complete a minimum of 560 hours of supervised field study within fourteen weeks. Specific requirements are identified in the Internship Manual available from the Department of Recreation Management and Policy.

Program Administration Option
This option prepares students for managerial positions in commercial, public and nonprofit organizations that provide recreation and leisure services. Curriculum design emphasizes the effective and efficient planning, delivery, and evaluation of leisure-based programs, services, and enterprises. Applied experience is a component of most courses in addition to a required practicum and the 14-16 week full-time internship under professional supervision. Depending upon the RMP electives and the career support emphasis or minor chosen, students may expect to find employment in a broad range of settings. Recent graduates have found employment in the areas of conference and meeting planning, municipal park and recreation services, recreational sports, commercial/entrepreneurial recreation businesses, youth serving agencies, resorts, and natural resource management positions in state and federal agencies.

In addition to the required core courses, students who pursue the program administration option must complete the following departmental requirements: RMP 558, Program Supervision and Leadership; RMP 665, Applied Marketing and Communication in Recreation Services; RMP 770, Management and Design of Recreation and Park Facilities; two RMP course electives; CS 401, Computer Applications, or an approved equivalent; HHS 540 or other descriptive statistics; PSYC 401, Introduction to Psychology; FS 525, Human Development; or SW 550. Program administration students must complete a minor or emphasis area of 18-20 credits to support their specific career goals.

Therapeutic Recreation Option
Therapeutic recreation utilizes recreation to help people with disabilities or illnesses to develop and use their leisure in ways that enhance health, independence, and well-being. Therapeutic recreation recognizes the
importance of quality of life and uses activities to remediate or rehabilitate functional abilities. Therapeutic recreation services are provided in a variety of settings including: hospitals, long-term care facilities, residential treatment facilities, schools, home health care, community recreation, correctional facilities, rehabilitation centers, camp and outdoor education centers, and adult day programs. Observation and applied experience is a component of several courses. Students complete a 14- to 16-week full-time clinical internship under the supervision of a Certified Therapeutic Recreation Specialist (CTRS). Students must purchase personal liability insurance for coverage for the clinical components of the curriculum. The Bureau of Labor Statistics reports that therapeutic recreation is one of the fourteen fastest growing occupations in the country. The occupational outlook statistics reflect a "39 percent increase in demand for recreational therapists with strong clinical backgrounds" for the beginning of the twenty-first century. Upon successful completion of this option, students are prepared to meet sitting requirements for the National Council for Therapeutic Recreation Certification Examination.

In addition to the required core courses, students who choose this option must complete the following departmental requirements: RMP 502, Foundations of Therapeutic Recreation; RMP 503, Therapeutic Recreation Rehabilitation Principles and Interventions; RMP 504, Therapeutic Recreation Mental Health Principles and Interventions; RMP 602, Clinical Treatment Lab I; RMP 603, Assessment and Treatment Planning in Therapeutic Recreation; RMP 604, Therapeutic Communication and Facilitation Techniques in Therapeutic Recreation; RMP 605, Clinical Treatment Lab II; CS 401, Computer Applications or approved equivalent; HHS 540, Statistics, or equivalent; PSYC 401, Introduction to Psychology; PSYC 561, Abnormal Behavior; FS 525, Human Development; ZOOL 507-508, Human Anatomy and Physiology; KIN 652, Clinical Kinesiology, and KIN 653A, Musculoskeletal Assessment.

Criteria for Admission and Retention

Internal transfer students interested in applying to the major must meet with an RMP faculty member prior to receiving an application for admission to the major. Transfer applications are accepted throughout the year, however priority is given to applications received by October 15th for Spring and March 15th for Fall. Applications can be obtained from the Department of Recreation Management and Policy. Students within the major are required to maintain a minimum 2.50 semester grade-point average every semester to retain good academic standing within the major. In addition, student majors must obtain a grade of C (2.00) or better in RMP courses and a grade of C- (1.67) or better in all other courses specifically required by the department.

Child Life Minor

This interdisciplinary minor is offered to a limited number of students by the therapeutic recreation option in the Department of Recreation Management and Policy and the Department of Family Studies. Upon completion of course requirements, students will be able to sit for the Child Life Specialist exam. All students complete three core courses: RMP 502, FS 525 and FS 623. Therapeutic Recreation students will select two courses from the following: FS 635, FS 641, FS 709, FS 734, and FS 772. Students will complete an Internship which will entail a minimum of 480 hours of experience and be supervised by a certified Child Life Specialist. Therapeutic recreation majors will be assigned a minor adviser from family studies.

Social Work (SW)

www.shhs.unh.edu/sw/

(For course descriptions, see page 238.)

Chairperson: Jerry D. Marx

Associate Professors: Mary Banach, Linda Rene Bergeron, Cynthia Anne Brousseau, Robert E. Jolley, Jerry D. Marx, Sharyn J. Zunz

Assistant Professors: Vernon Brooks Carter, Karen R. Oil, Martha H. Ortmann, Melissa Wells

Clinical Assistant Professors: Martha A. Byam, Kim Kelsey, Susan A. Lord, Sharon B. Murphy, Lee P. Rush

The Department of Social Work's undergraduate program offers both a major and a minor in social work. It is a specialized degree that prepares graduates for generalist social work practice with a solid foundation in the knowledge, skills, and value base of social work and the liberal arts. Social work graduates apply their education in working with individuals, groups, and social systems. In addition, the program prepares qualified students to pursue graduate education in schools of social work and other graduate programs in human services.

The baccalaureate program at the University of New Hampshire is accredited by the Council on Social Work Education (CSWE) and must meet rigorous academic standards to retain this accreditation. Social work majors pursue a program that encompasses the professional social work foundation of social welfare policy, social work practice, human behavior in the social environment, research, and field education. Course content on values and ethics, populations-at-risk, human diversity, and social and economic justice is integrated throughout the curriculum.

To enable students to gain direct experience and to integrate classroom content with the demands of professional social work practice, students complete an introductory-year service learning experience as well as a 450-hour social work internship over two semesters during the senior year. The senior field placement is a "capstone" experience in the final year of the baccalaureate program and is arranged between the student and the field education coordinator. Students are required to pay a liability insurance fee for their off-campus field education experience.

Social work majors earn a B.S. degree in social work. Graduates are eligible for practice in a variety of social work settings throughout the United States and full membership in the National Association of Social Workers. In addition, qualified graduates may be eligible for advanced standing in M.S.W. programs which offer advanced standing.

Academic Program

Social work majors are required to take SW 424, 525, 550, 551, 601, 622, 623, 625, 640, 640A, 641, 641A. In addition, students are expected to successfully complete four courses taken from the disciplines of anthropology/sociology, human biology, philosophy, and psychology. Many of these may also fulfill general education requirements. Students wishing to minor in social work are required to take SW 424, SW 525 and any three other courses offered by the department, excluding SW 640, 641. Students interested in either a major or minor in social work should consult with the undergraduate program coordinator, Martha Byam, Pettie Hall, Room 231, (603) 862-1077.
The objectives of the College of Life Sciences and Agriculture are to give students a fundamental education in the biological, natural, and social sciences and to introduce them to the arts and humanities. In addition, advanced technical and professional courses are offered to prepare students for graduate school or entry-level positions in areas concerned with improving the quality of life. Preparation can vary from fundamental studies of cancer cells to community-service planning, resource protection to genetic engineering, and molecular biology to biotechnology.

A blend of the basic and applied aspects of life sciences and agriculture, coupled with careful selection of supportive courses, ensures graduates the background and experiences necessary to be competitive in the job market. Potential employers include federal, state, and local governments; consulting firms; and industrial organizations. Graduates are employed as watershed, soil, and natural resource managers; associates in biomedical and agricultural research laboratories; marketing analysts and extension specialists; nutrition supervisors and environmental regulators; and information educators and communication experts.

Community governments employ graduates as service planners and land-use specialists, teachers in traditional education, public health technicians, and urban pest control specialists.

Positions are available in private and commercial organizations in production agriculture, food processing, landscaping, agribusiness, sales, and private planning. Graduates may also pursue entrepreneurial careers as greenhouse, nursery, farm, and natural resource managers; or as consultants, arborists, and environmental planners.

For those graduates with international aspirations, the Peace Corps and the Foreign Agriculture Service employ farm production experts, soil and water managers, market analysts, agricultural engineers, teachers, plant and animal breeders, and nutrition specialists.

Additionally, departments prepare students for advanced study in their chosen field of interest where graduate study is required for attaining their career goals.

**Degrees**

The college offers three undergraduate degrees: the bachelor of arts, the bachelor of science, and the bachelor of science in forestry. Some of the courses prescribed in these degree programs partially fulfill the general education requirements. Students should see their adviser for specific information.

**Bachelor of Arts**

The bachelor of arts degree is available in plant biology and zoology. Students must accumulate 128 credits, attain a 2.00 cumulative grade-point average, satisfy general education requirements, and complete a foreign language requirement (see page 18 for specific B.A. language requirements). Check individual departmental listings for specific major requirements and minimum acceptable grades in major courses.

**Bachelor of Science**

The bachelor of science degree is available in all departments or programs except forestry. University requirements are the same as for the bachelor of arts degree, except that a foreign language is not required and minimum acceptable grades may differ in some programs. Check individual departmental or program listings for specific major requirements.

**Bachelor of Science in Forestry**

The bachelor of science in forestry is a professional, designated degree available to students majoring in forestry. (For major requirements, see page 94.)

**General Science Certification**

Students majoring in animal sciences, biochemistry, biology, environmental conservation studies, environmental sciences, forestry, microbiology, plant biology, wildlife ecology, or zoology, may seek certification to teach science at the middle, junior, or high school level.

For further information, contact the coordinator of teacher education in the Department of Education.
Advising System
A member of the faculty whose area of interest is closely related to the student’s major is appointed as an adviser to assist the undergraduate in planning his or her academic program. Further advising is also available at the COLSA Advising Center and in the dean’s office, Rudman Hall.

Undeclared Status
Students may select a major upon entering the college or may wait until registration for the sophomore year. Students who are uncertain about choosing a specific major may remain undeclared during their freshman year. In most cases they should take the following courses, after which they should be ready to declare a major:

Fall
LSA 400
CHEM 403
BIOL 411
General education requirement
An introductory course in any department in the college

Spring
CHEM 404
BIOL 412
MATH 424B
General education requirement

Undeclared freshmen should explore possible majors by taking courses in the areas or programs that interest them most. They should talk to faculty, students, and their advisers concerning requirements, job opportunities, etc., in the various programs and should be prepared to declare a major when they register for the first semester of the sophomore year.

Combined Programs of Study
In addition to pursuing a single major, students may combine programs of study as follows (see University Academic Requirements for more information):

Minors: See University Academic Requirements, page 16.
Second Major: See page 19.
Dual-Degree Programs: See page 18.
Student-Designed Majors: See Special University Programs, page 109.
Other combined and interdisciplinary opportunities: See page 110.

UNH-EcoQuest New Zealand Study Abroad Program
The Department of Natural Resources offers highly motivated students the opportunity to study abroad through the UNH-EcoQuest New Zealand applied field studies program. Students engage in a unique multidisciplinary, research-oriented program and receive grade-point average credit for a semester abroad. Four fully integrated courses (NR 660, 661, 662, and 663 for 16 credit hours) focus on the ecological, resource management, and conservation and sustainability issues important to the natural environment, economy, and culture of New Zealand. Alternatively, students may participate in a two-course (NR 660, 662 for 8 credit hours) summer session. Contact Donna Dowal, (603) 862-2036.

Interdisciplinary Minors
Agribusiness
The agribusiness minor is designed to provide students in disciplines other than environmental and resource economics training in the economics and management of agricultural and other natural resource business firms. This program prepares students to work for private companies, governmental agencies or nonprofit, nongovernmental organizations. Students who are interested in operating their own business will also find this minor very useful. The courses in the agribusiness minor emphasize the applications of economic and business management principles.

Required
EREC 411, Environmental and Resource Economics Perspectives
EREC 501, Agricultural and Natural Resource Product Marketing or MKTG 550, Survey of Marketing
EREC 504, Business Management for Natural Resource Firms
EREC 606, Land Economic Perspectives: Uses, Policies, and Taxes
EREC 715, Linear Programming and Quantitative Models

For additional information, contact John M. Halstead, Environmental and Resource Economics Program Coordinator, 309 James Hall, (603) 862-3914.

Animal Behavior Minor
The animal behavior minor is designed for students who are interested in learning more about the mechanisms underlying the behavior of many different types of animals, as well as the reasons why certain behaviors may have evolved. Students interested in the animal behavior minor must complete a total of 20 credits of coursework (approximately 5 courses), from the list of courses below. Students must receive a grade of C- or better in each of these courses and no more than eight major requirement credits can be counted toward the minor. If a student is interested in using a relevant course that is not included in the following list, they must seek permission from either Dr. Michelle Scott or Dr. Win Watson in the Zoology department.

Required Courses (2):
Zool 713, Animal Behavior
Zool 777, Neurobiology and Behavior

Elective Courses (must take three, and one must be a psychology course):
PSYC 512, Psychology of Primates
PSYC 521, Behavior Analysis
PSYC 531, Psychobiology
PSYC 710, Visual Perception
PSYC 731, Brain and Behavior
PSYC 733, Drugs and Behavior
PSYC 735, Neurobiology of Mood Disorders
PSYC 737, Behavioral Medicine
PSYC 741, Animal Cognition
BCHM 702, Endocrinology
Zool 714, Ecology of Animal Behavior (Shoals)
Zool 733, Behavioral Ecology

Community Planning
Land use and its impact on the quality of life has emerged as a major policy issue in New Hampshire, as well as at the national and global levels. Planning is a multidisciplinary profession that requires people who understand the technical tools and social concepts required to guide the selection and implementation of alternative schemes compatible with long-term environmental and economic objectives. Students may supplement their major and general education course requirements with specific courses that will enhance their ability to find employment that requires knowledge of planning concepts and tools used in the formulation and implementation of effective land and resource planning by government agencies, nonprofit organizations, and private business firms.

Required
CIE SOS, Surveying and Mapping (coreq: MATH 425)
CD 415, Community Development Perspectives
CD 614, Fundamentals of Planning (prereq: EREC 411)
CD 777, Topics in Community Planning (prereq: CD 614)

Group II-Tools and applications in planning (choose one)
CD 672, New Hampshire Real Estate
CIE 505, Surveying and Mapping (coreq: MATH 425)
NR 757, Photo Interpretation and Photogrammetry
NR 760, Geographic Information Systems in Natural Resources
NR 609, Soils and Community Planning
NR 793, Watershed Water Quality Management (prereq: NR 504 or permission)
SOC 660, Urban Sociology
GEOG 590, Introductory Cartography
Group III - Resource management theory (choose one)
ECON 641, Public Economics (prereq: ECON 401, ECON 605, or permission)
EREC 572, Introduction to Natural Resource Economics
EREC 627, Community Economics (prereq: EREC 411 or equivalent)
EREC 756, Rural and Regional Economic Development
TOUR 767, Social Impact Assessment

Group IV - Additional complementary electives (optional)
CD 794, Community Planning Internship
GEOG 582, Economic Geography
GEOG 583, Urban Geography

For additional information, contact Professor Kelly L. Giraud, Community Development and Environmental Planning Program coordinator, 309 James Hall.

Genetics (GEN)
genetics.unh.edu/

(For course descriptions, see page 185.)

Professors: Thomas M. Davis, Clyde L. Denis, J. Brent Loy, Subhash C. Minocha, Robert L. Taylor, Jr.
Associate Professors: John J. Collins, Estelle M. Hrabak, Anita S. Klein, W. Kelley Thomas, Louis S. Tisa
Assistant Professors: Vaughn Cooper, Cheryl Whistler
Research Assistant Professor: Kevin Culligan
Research Associate Professor: William A. Gilbert

The interdepartmental program in genetics involves faculty from the departments of Animal and Nutritional Sciences, Biochemistry and Molecular Biology, Microbiology, Plant Biology, and Zoology. Undergraduates interested in genetics can pursue a minor (see requirements below) or can concentrate in genetics within majors such as Molecular, Cellular, and Developmental Biology, or General Biology. Students interested in preparing for graduate work in genetics should contact the chairperson of the genetics program early in their undergraduate careers for advice on courses.

Genetics Minor
Completion of 20 credits from the courses listed below, with a grade of C- or better, is required for a minor in genetics. At least two courses should be selected from each of the categories. Four (or more) credits of GEN 795, Investigations in Genetics, may be counted as one course toward fulfillment of the minor. Courses taken on a pass/fail basis may not be used for a minor. For the minor, 8 of the 20 credits can also be applied toward completion of your major degree. During the final semester, an application should be made to the dean to have the minor shown on the academic record.

Category 1
GEN 705, Population Genetics (prereq: BIOL 604; BIOL 528)
GEN 715, Molecular Evolution (prereq: BIOL 604)
GEN 723, Quantitative Genetics (prereq: BIOL 604; BIOL 528 strongly recommended)
GEN 753, Cytogenetics (prereq: BIOL 604)
GEN 766, Environmental Genomics (prereq: BIOL 604)
GEN 772, Evolutionary Genetics of Plants (prereq: BIOL 604 or equivalent; PBIO 412 or BIOL 411/412 or equivalent)
ZOOL 665, Conservation Genetics

Category 2
GEN 604, Principles of Genetics (prereq: BIOL 411-412 and CHEM 403-404)
GEN 706, Human Genetics (prereq: BIOL 604 or ANSC 612)
GEN 711, Genomics and Bioinformatics (prereq: BIOL 604)
GEN 754, Laboratory in Biochemistry and Molecular Biology of Nucleic Acids (prereq: BCHM 658/659 or 751; or permission)
GEN 771, Molecular Genetics (prereq: BCHM 658 or 751; BIOL 604; or permission)
GEN 774/775, Plant Biotechnology and Genetic Engineering (prereq: BIOL 604 or permission)
GEN 704, Genetics of Prokaryotic Microbes (prereq: MCR 503 and BCHM 658)

Marine Biology
The minor is designed to provide a foundation in marine biology and related sciences to any UNH undergraduate student with the exception of students enrolled in the marine and freshwater biology option of the biology program. It is offered through the Zoology department. The minor consists of 20 credits with grades of C- or better and no pass/fail courses. No more than 8 major requirement credits may be used towards the minor. All courses in the program are selected in consultation with the minor adviser (contact Dr. Larry Harris, Zoology department).

Students should declare their intention to minor in marine biology before the end of the junior year. During the final term, students should apply to the dean to have the minor shown on their transcript.

In addition, students are encouraged to become involved in a research project, either by working in a professor’s laboratory or by participating in the Undergraduate Ocean Research Project (TECH 797).

Sustainable Living
Issues of sustainable living involve every aspect of life. To learn about sustainable living, a community and bioregional context is desirable. The student must be aware of environmental issues and problems, have an understanding of ecology, increase his or her capacity to think about complex problems, and have hands-on learning experiences to approach effectiveness in sustainable living.

Required
BIOL 541, General Ecology
or NR 527, Forest Ecology
NR 435, Contemporary Conservation Issues and Environmental Awareness
or NR 502, Forest Ecosystems and Environmental Change
NR 784, Sustainable Living
NR 785, Systems Thinking for Sustainable Living

Choose one of the following
EDUC 630, Development of Food and Fiber in Third-World Countries
ECON 607, Ecological Economics
GEOG 673, Environmental Geography
NR 501, Introduction to Soil Sciences
NR 504, Freshwater Resources
NR 719, Wetlands Restoration and Mitigation
NR 720, International Environmental Politics and Policies for the 21st Century
NR 724, Resolving Environmental Conflicts
NR 725, Environmental Communications and Advocacy

Choose one of the following
NR 601, Environmental Conservation and Sustainable Living Internship
NR 665, Applied American Environmental Philosophy

For additional information please contact Dr. Robert Eckert, Natural Resources Department, James Hall.

Water Resources Management
Students in Biology, Environmental Conservation Studies, Forestry, Plant Biology, Wildlife Ecology, Environmental Engineering, Environmental and Resource Economics, Community Development, and related fields should consider a minor in Water Resources Management. There is a strong demand among consulting firms, state and federal agencies, and not-for-profit organizations for persons with knowledge and experience relevant to water resource management.
Programs of Study

Animal Sciences (ANSC)  
www.anscandnutr.unh.edu/
(For course descriptions, see page 148. See also Nutritional Sciences, page 97, and Medical Laboratory Science, page 95.)

The undergraduate Animal Sciences Program at UNH provides students with fundamental and applied education in nutrition, reproduction, genetics, physiology, pathology, cell biology, and animal management. Courses are offered in all areas of dairy and light horse production.

The Department of Animal and Nutritional Sciences has four major degree programs. They are a) animal sciences with options in equine sciences (equine industry and management, therapeutic riding, and equine science), bioscience and technology, and preveterinary medicine; b) dairy management; c) medical laboratory science with options in clinical chemistry, hematology, immunohematology, and microbiology; and d) nutritional sciences. The department is housed in Kendall Hall, a five-story animal science facility. This building houses the New Hampshire Veterinary Diagnostic Lab; an electron microscopy facility; and nutrition, physiology, and cell culture labs, all of which provide opportunities for students interested in basic animal sciences. The department maintains a light horse center and offers an equine program with courses in management, equine diseases, equine discipline, physical performance, and horsemanship specializing in dressage and combined training. Dairy facilities include housing for more than one hundred milk-producing cows in the new $1.6-million Dairy Teaching and Research Center. Responding to a need by farmers for scientific research to support organic dairy efforts, UNH is the first land-grant university to have an organic dairy farm. It is a research center for organic production and management and an education center for organic farmers. The organic dairy is housed at the Burley-Demeritt farm. Poultry facilities also permit research and work experience in poultry science.

The animal sciences degree has three program options: 1) equine sciences, 2) bioscience and technology, and 3) preveterinary medicine. In addition to satisfying the specific requirements of the major and options, all animal science majors must complete the University general education requirements. The UNH equine sciences option offers a unique and well-rounded program of study to students pursuing a career in the horse industry. The equine program's outstanding physical facilities are complemented by a strong, science-based curriculum taught by an experienced and talented faculty.

Students graduating from the UNH equine program receive a B.S. in animal science with a concentration in equine science. The core curriculum of study provides students with a solid background in the biological and equine sciences. Students then choose one of three tracks for career specialization: I) Equine Industry and Management, II) Therapeutic Riding, III) Equine Science.

Students in the bioscience and technology option often specialize in nutrition, reproduction, genetics, or cell biology. This curriculum prepares students for advanced training in graduate school programs or in various medical professions; entry-level positions in biomedical, biotechnical, pharmaceutical, and other scientific companies; or technical positions in many research and medical units.

The preveterinary medicine option is designed to meet the academic requirements of most veterinary schools. Requirements may be met within three years, allowing students to apply to veterinary school during their senior year. However, most students finish their senior year, thus allowing more time for electives, concentration in areas of secondary interest, and completion of graduation requirements.

Employers in agriculture prefer to hire an agricultural graduate with extensive knowledge in a related field (e.g., computer science) rather than a graduate in one of these areas with no knowledge of agriculture. Hence, animal science students are encouraged to obtain training in a field that complements study in animal sciences. Such areas may include cell biology, biotechnical skills, communications, computer science, education, or business. This is generally accomplished by either taking a concentration of courses or obtaining a minor in a specialty area. Attainment of sufficient training in a specialty area enhances opportunity for employment. A careers course is offered to help students select and prepare for a particular career area.

Development of optional career goals is important for preveterinary students. Admission to schools of veterinary medicine is highly competitive. Therefore, students in this option are urged to prepare for alternative careers as they complete preveterinary requirements.
All animal science majors are required to complete ANSC 406; CHEM 403-404; and either ENGL 419, 501, or 503. In addition, the requirements in one of the three following options must also be completed:

**Bioscience and Technology Option**

BOL 411-412; PHYS 401-402; MATH 424B; BOL 528; MIRC 503 or BOL 541; ANSC 511-512 or BOL 518 and 625/626; CHEM 545 or 565-566; BOL 604; BCHM 658/659 or 751-752; ANSC 750 and one 700-level ANSC course.

**Equine Science Option**

**TRACK I—EQUINE MANAGEMENT**

**Core Courses**

- ZOOL 412, Biology of Animals
- ANSC 404, Introductory Equine Science (waived for TSAS equine management graduads)
- ANSC 406, Careers in Animal Science
- ENGL 501, Introduction to Creative Nonfiction, ENGL 519, ANSC 543, or ENGL 529
- AAS 228, Anatomy and Physiology of Domestic Animals
- AAS 239, Fundamentals of Animal Health
- ANSC 432, Animal Forages
- AAS 235, Animal Nutrition
- BOL 528, Applied Biostatistics I
- ANSC 565, Principles of Horse Trials Management
- ANSC 620, Equine Diseases (waived for TSAS equine management graduads, but recommended)
- ANSC 622, Equine Disease Clinic (waived for TSAS equine management graduads, but recommended)
- ANSC 625, Equine Sports Medicine and Lameness
- ANSC 697, Equine Seminar (waived for TSAS equine management graduads)
- EREC 411, Environmental and Resource Economics Perspectives
- AAS 237, Equine Handling and Care Techniques
- AAS 246, Animal Business Applications
- ANSC 605, Equine Business Management
- ANSC 606, Field Experience (waived for TSAS equine management graduads)
- ANSC 724, Reproductive Management and Artificial Insemination

**At least five of the following**

- EREC 504, Business Management for Natural Resource Firms
- MGT 580, Introduction to Organizational Behavior
- CSL 202, Introduction to Non-Profit Organizations
- ADMIN 502, Financial Accounting
- CMN 500, Public Speaking
- ANSC 604, Equine Selection
- AAS 247, Applied Equine Management
- ANSC 507, Scientific Approach to Equine Discipline
- ANSC 602, Animal Rights and Societal Issues
- ANSC 701, Physiology of Reproduction
- ZOOL 713, Animal Behavior
- ANSC 640, Principles of Riding Instruction
- KIN 501, First Aid-Responding to Emergencies

**Suggested for all in Track I**

- AAS 278, Applied Animal Science Computer Applications
- AAS 234, Equipment and Facilities Management

**TRACK II—THERAPEUTIC RIDING**

**Core Courses**

- ZOOL 412, Biology of Animals
- ANSC 404, Introductory Equine Science (waived for equine-management program)
- ANSC 500, Methods of Therapeutic Riding
- ENGL 519, 501, Introduction to Creative Nonfiction, ENGL 503, ANSC 543, or ENGL 529
- ZOOL 507/508, Human Anatomy and Physiology
- AAS 226, Equine Conformation and Lameness or ANSC 604, Equine Selection
- AAS 252, Equine Health Management or ANSC 620/622, Equine Diseases and Disease Clinic
- EREC 411, Environmental and Resource Economics Perspectives
- AAS 237, Equine Handling and Care Techniques or equivalent
- AAS 246, Animal Business Applications or ANSC 605, Equine Business Management
- AAS 247, Applied Equine Management
- KIN 501, First Aid-Responding to Emergencies or equivalent
- ANSC 600, Field Experience
- ANSC 640, Principles of Riding Instruction
- ANSC 643, Principles of Therapeutic Riding Instruction
- ANSC 795, Investigations

**At least six of the following**

- OT 510, Exploring Occupational Therapy and Occupation
- RMP 501, Recreation Services for Individuals with Disabilities
- ANSC 507, Scientific Approach to Equine Discipline
- RMP 557, Recreation Services Program Design
- CSL 202, Introduction to Non-Profit Organizations
- CSL 203, Organizing and Supervising Volunteers
- CSL 208, Essentials of Fundraising for Community-Based Organizations or
- CSL 209, Essentials of Grant Writing for Community-Based Organizations
- MGT 580, Introduction to Organizational Behavior
- CSL 207, Introduction to Non-Profit Budgeting and Accounting Practices
- CMN 500, Public Speaking
- EREC 504, Business Management for Natural Resource Firms
- HIS 740, Collaborative Services for Children with Special Needs
- OT 500, Behavior and Development of Children or FS 525, Human Development
- COMM 520, Survey of Communications Disorders or COMM 533, Elementary American Sign Language

**Suggestive electives for students in Track II**

- AAS 278, Applied Animal Science Computer Applications
- AAS 254, Animal Assisted Activities and Therapies
- AAS 251, Human/Animal Bond

**Diploma program providing preparation for NARHA certification**

- ANSC 404, Introductory Equine Science or AAS 237, Equine Handling and Care Techniques
- ANSC 402, Horsemanship
- KIN 501, First Aid-Responding to Emergencies
- ANSC 500, Methods of Therapeutic Riding
- ANSC 795, Investigations, and a seminar on teaching therapeutic riding

**TRACK III—EQUINE SCIENCE**

**Core Courses**

- CHEM 403/404, General Chemistry
- BIOL 411/412, Principles of Biology I and II
- ANSC 404, Introductory Equine Science
- ANSC 406, Careers in Animal Science
- ENGL 519, 501, Introduction to Creative Nonfiction, ENGL 503, ANSC 543, or ENGL 529
- ANSC 511/512, Anatomy and Physiology
- BOL 528, Applied Biostatistics I
- ANSC 609, Principles of Nutrition
- ANSC 612, Genetics of Domestic Animals
- ANSC 620, Equine Diseases
- ANSC 622, Equine Disease Clinic
- ANSC 625, Equine Sports Medicine and Lameness
- ANSC 697, Equine Seminar
- EREC 411, Environmental and Resource Economics Perspectives
- ANSC 724, Reproductive Management and Artificial Insemination
- ANSC 701, Physiology of Reproduction
- ANSC 600, Field Experience
- ANSC 795, Investigations in Animal Science

**At least four of the following**

- AAS 235, Animal Nutrition
- AAS 239, Fundamentals of Animal Health
- ANSC 432, Animal Forages
- ANSC 640, Principles of Riding Instruction
- ANSC 641, Principles of Dressage Instruction
- ANSC 642, Principles of Jumping Instruction
- ANSC 701, Physiology of Reproduction
- ANSC 704, Principles of Pathobiology
- ANSC 718, Mammalian Physiology
- ANSC 724, Reproductive Management and Artificial Insemination
- ANSC 750, Nutritional Biochemistry
- BCHM 658/659, General Biochemistry and General Biochemistry Lab
- BOL 604, Principles of Genetics
- CHEM 545/546, Organic Chemistry and Organic Chemistry Lab
- ZOOL 713, Animal Behavior

**Preventive Medicine Option**

BOL 411-412; PHYS 401-402; MATH 424B; BOL 528; MIRC 503; ANSC 511-512; BOL 604; CHEM 651/652 and 653/654; BCHM 658/659; ANSC 750 and one 700-level ANSC course.

(For course requirements for the B.S. degree in dairy management, see Dairy Management, page 91.)

**General Science Certification**

(See Department of Education and COLSA/COLSAI Degrees, pages 32 and 83.)
Biochemistry (BCHM)

biochemistry.unh.edu/

(For course descriptions, see page 157.)

The field of biochemistry and molecular biology encompasses a broad range of the molecular life sciences, from biophysics and biochemistry to applied biology and medicine. The B.S. in biochemistry is based on a solid foundation in biology, chemistry, physics, and math, along with advanced courses in molecular biology, biochemistry, cell biology, and genetics. The combined B.S.-M.S. degree program allows outstanding students with well-defined career plans to augment their bachelor’s degree program with an intensive research program and graduate-level course work leading to the master’s degree.

The Department of Biochemistry and Molecular Biology offers specialized training in the areas of molecular genetics, signal transduction, gene regulation, bioinformatics, molecular evolution, cancer biology, macromolecular interactions, glycobiology, lipid metabolism, endocrinology, genomics, and proteomics. Undergraduate students are encouraged to become involved in research projects sponsored by external granting agencies such as the National Institutes of Health, the National Science Foundation, and others.

Students interested in the biochemistry major should consult with the department chairperson or a faculty member as early as possible to ensure the most effective curricular planning.

For first-year students with a strong high school preparation in both chemistry and mathematics (including calculus), the following schedule is recommended:

### Fall

- BIOL 411, Principles of Biology I
- CHEM 403, General Chemistry I
- MATH 425, Calculus I
- ENGL 401, First Year Writing

### Spring

- BIOL 412, Principles of Biology II
- CHEM 404, General Chemistry II
- MATH 426, Calculus II
- General education course

For first-year students lacking a strong background in chemistry and mathematics, the following schedule is recommended:

### Fall

- BIOL 411, Principles of Biology I
- CHEM 403, General Chemistry I
- MATH 425, Calculus I
- ENGL 401, First Year English
- General education course

### Spring

- BIOL 412, Principles of Biology II
- CHEM 404, General Chemistry II
- MATH 426, Calculus for Life Sciences
- General education course

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### Bachelor of Science in Biochemistry

The bachelor’s degree in biochemistry consists of a set of core requirements (Group I) and a set of required electives from several subject areas (Groups II-V):

#### I. All of the following

- BIOL 411, 412, Principles of Biology I, II
- CHEM 403, 404, General Chemistry I, II
- MATH 425, 426, Calculus I, II, or 424B, Calculus for Life Sciences and Biology
- BIOL 528, Applied Biostatistics I
- MIRC 503, General Microbiology
- BIOL 604, Principles of Genetics
- BIOL 605, Eukaryotic Cell and Developmental Biology
- PHYS 401, 402, Introduction to Physics I, II, or PHYS 407, 408, General Physics I, II
- BCHM 751-752, Principles of Biochemistry
- BCHM 755, Laboratory in Biochemistry and Molecular Biology

#### II. One of the following molecular biology courses

- BCHM 711, Genomics and Bioinformatics
- BCHM 766, Environmental Genomics
- BCHM 774, Molecular Genetics
- BCHM 782, Developmental Genetics
- GEN 715, Molecular Evolution
- BCHM 790, Current Topics in Biomedicine

#### III. One of the following biochemistry courses

- BCHM 702, Endocrinology
- BCHM 750, Physical Biochemistry, or CHEM 683, 684, Physical Chemistry I, II
- BCHM 763, Biochemistry of Cancer
- BCHM 794, Protein Structure and Function
- BCHM 790, Current Topics in Biomedicine

#### IV. One of the following laboratory techniques courses

- BCHM 754, Laboratory in Biochemistry and Molecular Biology of Nucleic Acids, or BCHM 799, Senior Thesis (4 cr.)
- BCHM 795, Investigations in Biochemistry and Molecular Biology (4 cr.)
- ANSC 714, Research Methods in Endocrinology, or ANSC 751, Cell Culture
- CHEM 756, Advanced Organic Chemistry Laboratory, or CHEM 763, Instrumental Methods of Chemical Analysis Laboratory
- GEN 753, Cytogenetics
- MIRC 602, Pathogenic Microbiology, or MIRC 704, Genetics of Prokaryotic Microbes, or MIRC 705, Immunology, or MIRC 706/708, Virology and Virology Lab, or MIRC 717, Microbial Physiology
- PBIO 774/775, Plant Biotechnology and Genetic Engineering

#### V. One additional course from groups II-IV

The biochemistry curriculum provides most of the required and recommended courses for students seeking admission to professional schools in medicine, dentistry, veterinary medicine, and pharmacy. Students who major in biochemistry can also use their training in conjunction with advanced degrees in law and business.

Approximately 50 percent of the students who graduate with a major in biochemistry seek advanced degrees. Many biochemistry majors go on to attend graduate school in all areas of the life and biomedical sciences, especially graduate programs in genetics, molecular biology, biochemistry, cell biology, and chemistry. Recipients of an M.S. degree are more attractive to employers and often obtain better positions, greater salaries, and more responsibility and independence. A Ph.D. degree is eventually required for those who wish to direct research programs, be involved in state-of-the-art scientific research, become a professor in a college or university, or obtain an executive position in a science-related area of industry or government.

Students obtaining the B.S. in biochemistry enjoy excellent job prospects immediately upon graduation. There is currently a demand for skilled research technicians in biotechnology companies, pharmaceutical companies, government agencies, forensics, academic research laboratories, and hospitals. Students graduating in biochemistry have knowledge that is valuable in the fields of management, sales, marketing, regulatory affairs, technical writing, and scientific journalism. With additional courses in education, the B.S. in biochemistry also qualifies graduates to teach at the elementary, junior high, and high school levels.

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### A combined Bachelor of Science and Master of Science in Biochemistry

This is a five-year program leading to a combined bachelor and master’s degree in biochemistry. It is designed for highly motivated and qualified students seeking additional training to further their career goals as a researcher in the life sciences.

#### Admission Policy

Admission to the combined degree program is highly competitive. Students wishing to pursue this option must have a grade-point average greater than 3.20 at the time of application. A thesis adviser must be identified during the junior year, and the approval of the adviser and department chairperson must be obtained. Prior to the first semester of the senior year, the student must formally apply to the Graduate School and receive early admission. The requirement for the Graduate Record Examinations is waived for combined degree applicants.
Requirements

Thirty credits of graduate level (800-900) coursework (including dual credit courses) must be completed. Six to eight credits 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 (see Graduate School catalog) must be followed, including completion of preliminary exams, conducting a research project, and passing an oral examination based on the master's thesis project.

Suggested Program

Because of the intensive nature of the combined degree program, the thesis research project should be initiated as early as possible. A guidance committee should be established no later than the beginning of the fifth year to approve the student's proposed course of study. The following schedule is recommended:

Junior year
Identify thesis adviser and begin research project during the summer following junior year.

Senior year
Senior thesis (BCHM 799) during both semesters and the following summer, along with two dual-credit courses (800-900 level).

Fall semester, fifth year
Two 800/900 level courses (6-8 cr.)
BCHM 997 (1 cr.)
BCHM 899 (5 cr.)

Spring semester and summer, fifth year
One 800/900 level course (3-4 cr.)
BCHM 998 (1 cr.)
BCHM 899 (5 cr.)
Special topics (1-2 cr. as needed)

Research should be completed and the master's thesis defended during the summer.

Support

Students in the B.S./M.S. program are eligible for support through University Financial Aid. Additional support may be available from the student's adviser.

General Science Certification

(See Department of Education and COLSA/Degrees, pages 32 and 83.)

Biology (BIOL)
biology.unh.edu/

(For course descriptions, see page 157.)

Coordinator: David H. Townson

The interdepartmental program in biology is designed to provide a strong and a broad background in biological sciences to students interested in education in the life sciences. The biology program integrates theoretical and practical (hands-on laboratory and field work) courses in different aspects of the biology of animals, microbes and plants. The curriculum is designed to reflect the diversity of the biological systems in nature. It encompasses the study of structural and functional relationships of living organisms at the molecular, cellular, and organismal level; the interactions of the living systems with the environment and with each other; and the evolutionary relationships of various forms of life. The goal is to create a facilitative environment for those with a scholarly interest in the biological sciences, and to extend their understanding, awareness, and appreciation of the diversity of the biological sciences.

The program is aimed at promoting excellence in biological science education by involving undergraduate students in strong interaction with faculty both in the classroom and research laboratories, and to encourage the development of high-quality undergraduate programs in all aspects of biology.

Biology Core Curriculum

All biology and several of the biological sciences majors begin with the biology core curriculum. The biology courses in the core curriculum constitute an integrated sequence of courses imparting basic knowledge of biology in order to expose the students to the breadth of knowledge inherent in the biological sciences. The biology core allows a student to obtain a broad background in biology and related physical sciences and math. While it is recommended that the core curriculum be substantially completed in the first two years, students are encouraged to consult with their academic adviser to select one or more courses in their major during the sophomore year that may provide a gateway to the major. This may result in delaying one or more of the core courses in the junior year. By the end of the sophomore year, students are expected to have selected a departmental major or one of the four biology options leading to a B.S. degree. These options are: 1) general biology; 2) ecology, evolution, and behavior biology; 3) marine and freshwater biology; and 4) molecular, cellular, and developmental biology.

Biology Core Curriculum Courses

BIOL 400, Professional Perspectives on Biology
BIOL 411 & 412, Principles of Biology I, II
BIOL 541, General Ecology
MICR 503, General Microbiology
BIOL 604, Principles of Genetics
CHEM 403 & 404, General Chemistry
CHEM 545/546 Organic Chemistry and BCHM 658/659, General Biochemistry or CHEM 651/653 and CHEM 652/654, Organic Chemistry
MATH 424B Calculus for Life Sciences or 425, Calculus I
BCHM 528 Applied Biostatistics I or MATH 426, Calculus II
PHYS 401 and 402, Introduction to Physics
ENGL 501 (or equivalent), Introduction to Creative Nonfiction
EDUC 500, Exploring Teaching

Typically, students take BIOL 400; BIOL 411 & 412; CHEM 403-404; and MATH 424B in their freshman year, and then complete the remainder of their core requirements during the sophomore and junior years.

In addition to the core curriculum, the requirements for individual options are described separately.

1BIOL 400 is required only for first year biology majors.
2BIOL 411 and 412 are not sequential and may be taken in reverse order.
3CHEM 651/653 and 652/654 and ENGL 501 are required for premedical or affiliated professional programs.
4MATH 426, Calculus II can be substituted for Statistics, but we recommend Statistics.
5Required only for those preparing for teacher certification.
Academic Requirements

To receive the B.S. degree in biology, students must complete 128 credit hours with a 2.0 cumulative grade-point average (GPA). Courses must include all UNH General Education requirements, biology core curriculum requirements, and the requirements for the selected option. A minimum grade of C- is required in all biological science courses that are counted towards the requirements for a degree in biology (all four options). The only exception is that a passing grade below a C- will be accepted in a student's first biology course (BIOL 411 or 412). Students who expect to compete successfully for post-baccalaureate programs should attain a cumulative GPA of 3.0 or higher by the end of the sophomore year and maintain it at this level.

Students should consult with their academic adviser during their freshmen and sophomore years for assistance in determining the most appropriate option or major for their professional goals. Since biology core courses are required of all biological science majors, it is relatively easy to change majors within the biological sciences during this period.

Note: It is strongly recommended that students participate in an exchange semester at another university or in a field-oriented program or internship. There are many exchange opportunities available in which a full semester of credits toward the major may be earned. In addition, students should explore the courses at the Shoals Marine Laboratory (SML), which provides an excellent setting for several “field-oriented” courses during the summer. Often there is financial support available for the SML programs (see the SML Web site for details www.shoals.unh.edu) or the Cornell Web site at www.sml.cornell.edu. It is further recommended that students explore possibilities of one or more semesters of Independent Investigation (research projects). For details, students should contact their adviser or the biology program office. Financial support is available for most of these programs.

Premedical and other pre-health professional students should visit the premedical office in Hood House for additional information on requirements for specific professional schools. The following elective courses will be helpful in preparing for admission to post-baccalaureate programs in the health professions and for their required aptitude examinations: BCHM/ANSC 702, ZOOL 518, ZOOL 625/626, BIOL 605, BCHM 751/752, ANSC 511/512.

One 600, 795, or 796 experience totaling three or more credits or any two 795-796 experiences of two credits each can fulfill one course requirement in any category with adviser’s approval. A Petition for Academic Variance approved by the biology program director is required to count 795-796 experiences for more than one major required course. Students should check the UNH WEBCAT (webcat.unh.edu), the biology Web site (biology.unh.edu), and the UNH online catalog for updates and current course offerings.

Biology Options

In order to receive a B.S. in biology, a student may choose from one of the four biology options. These options are: 1) general biology; 2) ecology, evolution, and behavior biology; 3) marine and freshwater biology; and 4) molecular, cellular, and developmental biology. A complete list of approved courses in each option is available from the student’s adviser, the biology program office, and the biology program Web site at biology.unh.edu.

The general biology option within the biology major provides broad-based training in the biological sciences for students who prefer not to specialize at the undergraduate level. Students must choose eight courses in addition to the biology core curriculum courses as specified in the categories listed in the option requirements (see Web site biology.unh.edu). Within the biology core, BIOL 528 is preferred to MATH 426; however, either is acceptable, and the sequence CHEM 545/546-BCHM 658/659 is preferred to CHEM 651/653-CHEM 652-654, for all students in the option, except for those who are pre-health professionals. Corequisite lecture and lab courses count as one course. Courses listed in more than one category will satisfy requirements in only one category.

The marine and freshwater biology (MFB) option provides broad-based training in the aquatic biological sciences for students who prefer to take additional courses in the area of marine and freshwater biology. Students interested in aquaculture and fisheries may also choose this option by taking appropriate courses in consultation with their adviser. Students must choose eight courses in addition to the biology core curriculum courses to fulfill the requirements of this option. All students must take Biology of Lakes (PBIO/ZOOL 717) or Field Studies in Lake Biology (PBIO/ZOOL 719). For additional course requirements, the students should visit the biology Web site at biology.unh.edu.

The molecular, cellular, and developmental biology (MCDB) option provides an opportunity for broad training in molecular, cellular, and developmental biology, and the biotechnology area for students who would like to achieve limited specialization in this field. Students interested in the interdisciplinary fields of genetics, genomics, and bioinformatics may also choose this option by taking appropriate courses in consultation with their adviser. This is in addition to broad-based training in the basic areas of biology and related physical sciences covered in the core curriculum. Students choose eight courses from the list of approved courses (available on the Web at biology.unh.edu) in addition to biology core curriculum courses, in order to complete this option. The sequence CHEM 651/653-CHEM 652-654 is preferable to CHEM 545/546 and BCHM 658/659.

The ecology, evolution, and behavior (EEB) option within the biology program provides broad training in organismal and environmental biology, and provides an opportunity for limited specialization in the field of ecology, conservation, evolution, or behavior. Students must choose eight courses in addition to the biology core curriculum to complete this option. All students are required to take ZOOL 690. An additional seven courses should be selected as specified in the list of approved courses (biology.unh.edu). Within the biology core, BIOL 528 is preferred to MATH 426; however, either is acceptable.

Prehealth Professional Program

Students who wish to pursue postgraduate degrees in the health care professions should visit the premedical advising office in Room 102, Hood House. For more information, call (603) 862-2064 or visit the program’s Web page at www.unh.edu/premed-advising.

Biology Teacher Certification and General Science Certification

Biology teacher certification for students preparing to teach high school biology may be obtained through the Department of Education’s five-year, undergraduate-graduate degree program. Students are required to take EDUC 500 (preferably in the sophomore year), earn a bachelor’s degree in one of the biological sciences, and complete a fifth year, which includes an internship and coursework leading to a master’s degree in education. General science certification for students preparing to teach science in middle and junior high schools can be obtained through the Department of
Education's general science certification program. For further information, see Education, or contact the Department of Education's teacher education coordinator.

Biology Minor
A biology minor may be earned by completing the following requirements: 1) BIOL 411-412 or PBIO 412 and ZOOL 412; 2) one course from each of the three major organism groups: a) animals (ANSC or ZOOL courses), b) microbes (MICR courses), and c) plants (PBIO courses); and two additional biological science courses at the 600-700 level.

Students interested in a biology major or minor should contact the Biology Program Office, (603) 862-1452.

Community and Environmental Planning (CD)
www.dred.unh.edu/CD.htm
(For course descriptions, see page 166.)

The Community and Environmental Planning Program prepares students for professional careers as local government administrators, town or regional land-use planners, and community facilitators and educators. It is an applied social science degree program that gives the student an understanding of the interrelated social, economic, political, environmental, and technical factors that influence a community and its residents. The curriculum takes an interdisciplinary approach and includes field experience and internships as vital components that complement classroom and independent research.

Students majoring in community and environmental planning are encouraged to concentrate in one of three areas: 1) community change and development, 2) community public administration, and 3) community and regional planning. These areas of specialization provide the necessary background and training to prepare graduates for entry-level positions with local municipalities and agencies throughout the nation. The program also provides a firm base for graduate study in a variety of areas such as regional planning, public administration, rural sociology, economic development, and law.

A minor in community and environmental planning provides opportunities for students in other areas to better understand the application of their knowledge to specific community issues. The minor complements majors in both technical fields and liberal arts.

Local municipalities in New England are turning to full-time professional administrators to assume responsibility for the day-to-day administration, management, and planning activities that were previously carried out by part-time town officials. Officials at the New Hampshire Municipal Association estimated that New Hampshire needs, each year, at least twenty-five new graduates in community and public administration to fill local government professional needs. In addition to professional administration or planning positions in local or regional government, employment opportunities are also available with public agencies and organizations at the state, national, and international levels.

Students interested in the challenges of community and environmental planning should consult with Kelly L. Giraud program coordinator, Department of Resource Economics and Development, 309 James Hall, (603) 862-4811.

Required Courses
CD 415, Community Development Perspectives or CSL 201, Intro to CSL
CD 508, Applied Community Development
CD 614, Fundamentals of Planning
CD 777, Topics in Community Planning
CD 794, Community Planning Internship, or CD 793, Community Administration Internship
ERE 411, Environmental and Resource Economics Perspectives
ERE 525, Statistical Methods and Applications
ERE 606, Land Economic Perspectives: Uses, Policies, and Taxes
ERE 627, Community Economics
TOUR 700, Marketing Communications Research: Methodological Foundations
TOUR 705, Ecotourism: Managing for the Environment, or TOUR 767, Social Impact Assessment
MATH 420, Finite Mathematics
CSL 204, Managing Change and Conflict in Communities and CD 672 New Hampshire Real Estate
POLT 502, State and Local Government, or POLT 551, Global Urban Politics

Dairy Management
www.anascandnitr.unh.edu/
(See page 86 for the Department of Animal Nutrition and Sciences. For Animal Science [ANSC] courses, see page 148.)

The Dairy Management Program, offered by the Department of Animal and Nutritional Sciences, is designed to provide students with solid training in areas important to the successful management of a dairy enterprise, for employment in related agribusinesses (e.g., pharmaceutical and feed industries), or for those wishing to pursue additional training leading to the M.S. or Ph.D. degree in dairy science or its related disciplines. Dairy management students receive training in areas such as nutrition, reproduction, diseases, genetics, lactation physiology, forages, agribusiness finance, personnel management, computer science, and public relations. In addition, junior and senior students enrolled in this program will be given complete responsibility for managing the UNH teaching herd with other students, acquiring actual management experience along with their basic subject matter training. The UNH Teaching and Research Center, a modern dairy facility, houses approximately one hundred milking cows plus a similar number of non-lactating animals.

In addition to general education requirements, a typical dairy management student will take the following courses:

First Year
ANSC 408 (optional), 409, 410, 430; BIOL 411; CHEM 403-404; ENG 401; EREC 411

Second Year
ANSC 432, 511, 512, 543, 650; CS 401; PBIO 421; EREC 504

Summer Internship
ANSC 600

Third Year
ANSC 609, 612, 530, 650, 701 and/or 715, 710

Fourth Year
ANSC 698, 708, 727, 728; MGT 580 or 713
Students interested in pursuing graduate studies take MATH 424B, CHEM 545-546, BCHM 658-659 and MICR 503 in lieu of PBIO 421 and CS 401.

Environmental Conservation Studies
www.unh.edu/natural-resources/ug-ec.html
(For Natural Resources [NR] courses, see page 217.)

The environmental conservation studies (ECS) major gives students a broad, interdisciplinary background for developing their understanding of environmental and resource problems and what is needed to solve them. It also provides a solid foundation for the development of critical thinking skills. The program is designed to ensure that graduates possess broad-based integrated knowledge of how local and global ecological systems work as well as an understanding of the interdependency between people and the environment. Building on a solid natural science base, students discover how political, institutional, and economic systems relate to environmental quality and learn ways to sustainably manage human activities within the constraints of the Earth's ecological systems. Students acquire a set of basic skills and problem solving tools that enable them to tackle complex environmental conservation problems. Graduates
will have gained hands-on practical experience integrating and applying their accumulated knowledge and skills in real world situations.

International education to support ECS students' educational goals is encouraged as a means to broaden their perspectives and knowledge, particularly through the UNH-Ecoquest New Zealand Field Studies Program. ECS students may also take advantage of a wide range of undergraduate research opportunities.

ECS students meet a set of 19 CORE requirements, through which they develop a foundation in natural resources, biology, ecology, chemistry, water quality management, soils, natural resources and environmental policy, economics, environmental ethics, and environmental law. They also acquire basic statistics, oral communication, writing and geographic information skills and develop their abilities to apply their knowledge and skills professionally through a practicum (internship) and a capstone course.

In addition to the CORE, each student chooses a 36 credit hour specialization, which may be selected from a range of natural resources and environmental policy and management course sequences that provide a specific focus as each student develops an area of academic competency and the skills sets to help meet her or his career goals. For example, students can choose specializations in the following subject areas: land and water resource policy and management; international environmental and natural resource policy and sustainable development; environmental education; communication; public participation and leadership; or conservation biology. Or a student may, in consultation with his or her adviser, design a specialization.

Students with strong interests in field-based natural resource management careers can choose a focus on a particular land or water natural resource system, such as forest resources, marine and coastal resources, watersheds or wetlands, or food production to build their expertise. Those with wildlife interests and habitat protection may choose conservation biology. Students with interests in environmental policy, politics, law and administration, or sustainable community development may want to gain additional background through selected courses in the social sciences. Those with interests in environmental education may want to obtain a teaching certificate or develop expertise in outdoor education or leadership. Others may want to pursue interests in environmental communication through courses in journalism or the visual or theater arts. Many

undergraduates in ECS participate in faculty research or gain experience through UNH's undergraduate research opportunities programs. Students with particular interests in international environmental studies may want to participate in the dual major in International Affairs.

Students graduating with a B.S. degree in environmental conservation studies, with excellent academic records, are qualified for graduate work in environmental studies, environmental sciences, natural resources and environmental policy, resource management, conservation biology, environmental law, or environmental education and communication. ECS graduates work with private or nongovernmental conservation organizations; local, state or federal natural resources or planning agencies; industrial firms (e.g., waste management, compliance, land protection, watershed management, community planning, energy conservation, etc.); in primary and secondary education; field studies programs; journalism; and specialized environmental consulting firms. A number of graduates also choose to serve in the Peace Corps or with AmeriCorps prior to making more specific career path commitments.

Degree Core Requirements

1. NR 400, Professional Perspectives in Natural Resources
2. NR 401, Introduction to Natural Resources
3. FIRE 412, Introductory Botany
4. ZOOL 412, Ecology of Animals, or BIOL 411/412
5. Introductory Research System Course (choose one)
   NR 415, Global Biological Change
   or NR 425, Field Dendrology
   or NR 433, Wildlife Ecology
   or NR 502, Forest Ecosystems and Environmental Change
6. Ecology Elective (choose one)
   BIOL 541, General Ecology
   NR 527, Forest Ecology
   NR 660, Ecology and Biogeography of New Zealand
   (only for UNH-EcoQuest NZ program students)
   ZOOL 503, Introduction to Marine Biology
7. Introduction to Natural Resource Economics
   EREC 411, Environmental and Resource Economics Perspectives
   or ECON 402, Principles of Economics (Micro)
8. Physical Science (one relevant to specialization)
   CHEM 403, General Chemistry
   ESCI 409, Environmental Geology
   or PHYS 401, Intro to Physics
9. NR 504, Freshwater Resources
10. NR 501, Introduction to Soil Sciences
11. NR 602, Natural Resources and Environmental Policy (WI)
12. Environmental Ethics and Values (choose one)
    NR 701, Ecological Values and Ethics (WI)
    NR 784, Sustainable Living
    PHIL 755, Environmental Philosophy and Policy
    HIST 618, American Environmental History
    SOCI 665, Environmental Sociology
13. One Statistical Skills course (BIOL 528, PSYC 402, SOC 502 or equivalent)
14. One Communication Skills course
   CMN 600, Public Speaking as a Civic Art
   EDUC 7108, Micro-communications
   THDA 520, Creative Drama (Children's Theater)
   THDA 583, Introduction to Puppetry
   THDA 622, Storytelling, Story Theater and Involvement Dramatics
   THDA 624, Theater for Young Audiences
15. One Critical Analysis Writing Skills course (beyond ENGL 401)
   ENGL 419, 502, 521, 621, or 623
16. Information Management Skills
   NR 658, Introduction to Geographic Information Systems
17. NR 718, Law of Natural Resources and Environment
18. NR 637, Practicum in Environmental Conservation (Internship)
19. NR 735, Land Conservation Principles and Practices, or NR 663, Applied Directed Research in New Zealand (WI)

Specialization (36 credits required)

Students select one from the following listed specialization areas to develop their expertise in an area of interest. Alternatively, a student may, in consultation with the student's adviser, design a specialization area.

A. Land and Water Resource Policy and Management
B. International Environmental and Natural Resource Policy and Sustainable Development
C. Environmental Education, Communication, Public Participation and Leadership
D. Conservation Biology

For each area of specialization students are required to select one listed course from each of 5 specified categories:

Category 1: Ecology (a listed 600 or higher level course)
Category 2: Economics (a listed 600 or higher level course)
Category 3: Theory (from identified courses relevant to the specialization)
Category 4: Problem Solving Skills (from identified courses relevant to the specialization)
Category 5: Professional and/or Field Skills (from identified courses relevant to the specialization)

Students select four additional courses in their Specialization to complete their 36 hour specialization. These four courses may be selected from any of the 5 categories. The majority of courses selected for the student's specialization should be at the 600 or 700 level. Special permission will be required to
apply a 400 level course to fulfill a specialization requirement. Students must achieve a grade of C- or better for all courses they wish to be counted for their environmental conservation studies major. Students work closely with a faculty adviser to plan their program of study.

Students interested in the environmental conservation studies program may consult with the program coordinator Robert Echert, James 206E, (603) 862-2508.

Environmental Conservation Studies Minor
A minor in environmental conservation studies (5 courses totaling at least 20 credits) is available to students outside the environmental conservation studies major.

Required Courses
1. Any one of the following: PBIO 412, ZOOL 412, BIOL 411, BIOL 412.
2. NR 435, Contemporary Conservation Issues and Environmental Awareness, or NR 502, Forest Ecosystems and Environmental Change
3. One course in ecology: Possibilities include: NR 433, NR 425, NR 527, NR 660, BIOL 541.
4. One intermediate course in Environmental Policy, Ecological or Resource Economics
   NR 724, Resolving Environmental Conflicts
   NR 731, Ecosystem-Based Governance: Policies and Management Strategies
   NR 662, Environmental Policy, Planning and Sustainability in New Zealand
   NR 718, Law of Natural Resources and Environment
   NR 720, International Environmental Politics and Policies for the 21st Century
   ECON 607, Ecological Economics
   EREC 606, 611, 627 or 676
5. Choose One
   NR 504, Freshwater Resources
   NR 501, Introduction to Soil Sciences
   NR 661, Restoration Ecology and Ecosystem Management in New Zealand
   NR 785, Systems Thinking for Sustainable Living

Students interested in the environmental conservation studies minor should contact Professor Mimi Larsen Becker, Department of Natural Resources, James 207B, (603) 862-3950.

Environmental Horticulture (PBIO)
www.pbio.unh.edu/undergraduate/environhtbs.html
(For Plant Biology [PBIO] courses, see page 227.)

This program offers a flexible curriculum for students interested in a multifaceted view of plant agriculture that also embraces issues of environmental stewardship, food safety, international development, and other topics of broad public concern. A degree in environmental horticulture will prepare students for careers managing greenhouses, nurseries, farms, and golf courses; in teaching; in consulting and applied research; in practicing journalism; in working for park and highway planning commissions; in working in sales or brokerage aspects of wholesale and retail marketing; and in finding employment in food- and feed-processing firms.

Requirements
Students are required to take the core courses, support courses, and 20 credits of elective courses.

Core Courses Credits
PBIO 401, Plant Biology Orientation 1
PBIO 412, Introductory Botany 4
PBIO 421, Introductory Horticulture 4
PBIO 501, Basic Biochemistry 3
or BCHM 685/689, General Biochemistry 5
PBIO 546, Plants, Soils, and Environment 4
or NR 501, Introduction to Soil Sciences 4
or HT 215, Soils and Land Use 2
or HT 217, Soils and Plant Nutrition 2
PBIO 547, Environmental Horticulture 4
PBIO 572, Plant Propagation 4
or HT 204, Plant Propagation 4
PBIO 566, Systematic Botany 4
PBIO 600, Field Experience (Horticulture Related) 3
PBIO 701, Plant Physiology 3
PBIO 702, Plant Physiology Lab 2
PBIO 612, Plant Genetics, Reproduction 4
or BIOL 604, Principles of Genetics 4
PBIO 651, Plant Pathology 4
or PBIO 653, Forest and Shade Tree Pathology 4
or HT 234, Plant Management 4
PBIO 726, Integrated Pest Management 4
PBIO 797, Senior Seminar 1

Support Courses Required from Other Departments
BIO 528, Applied Biostatistics I 4
CHEM 403, General Chemistry I 4
CHEM 404, General Chemistry II 4
EREC 411, Environmental and Resource Economic Perspectives 4
ZOOL 745, Biology and Diversity of Insects 4

Electives
A minimum of 20 credits should be selected from department courses. Students are offered some flexibility in selection of electives, although these electives should be related to horticulture and selected in consultation with an adviser.

Environmental and Resource Economics (EREC)
www.dred.unh.edu/undergraduate/erec.html
(For course descriptions, see page 181.)

This program offers training in environmental and resource economics, including public resource policy, resource management, natural resource and environmental economics, and community economics and finance. The curriculum emphasizes applied economics in the context of public policy. Training is also available in agricultural economics, including agribusiness, small business management, food marketing, agricultural policy, and world food supplies.

Students majoring in environmental and resource economics will normally concentrate in one of the following three areas: environmental and natural resource economics, agricultural economics, or community economics. In addition, students must satisfy general education requirements, which lead to a broad university education. Majors interested in the economic or business aspects of agriculture and natural resources will be expected to take courses in the biological sciences.

Students majoring in any of the social science, life science, and agriculture departments of the University may find it to their advantage to elect courses or a minor in environmental and resource economics or agribusiness. By doing so, their basic training can be supplemented in a specific area of interest, such as resource development and natural resource policy for social science majors, farm management and agricultural marketing for agricultural majors, and community economics and finance for students interested in local government and development.

Required Courses
All of the following
ECON 401, Principles of Economics (Macro)
ECON 605, Intermediate Microeconomic Analysis
ECON 611, Intermediate Macroeconomic Analysis, or ECON 635, Money and Banking
EREC 411, Environmental and Resource Economics Perspectives
EREC 504, Business Management for Natural Resource Firms
EREC 525, Statistical Methods and Applications
MATH 420, Finite Mathematics, or MATH 424B, Calculus for Life Sciences
At least five of the following, of which two must be 700 level
EREC 501, Agricultural and Natural Resource Product Marketing
EREC 572, Introduction to Natural Resource Economics
EREC 606, Land Economics Perspectives: Uses, Policies, and Taxes
EREC 611, Marine Resource Economics
EREC 627, Community Economics
EREC 633, Economics of Travel and Tourism
EREC 676, Economics of Water Use and Quality Management
EREC 708, Environmental Economics
EREC 715, Linear Programming and Quantitative Models
EREC 756, Rural and Regional Economic Development
TOUR 700, Marketing Communications Research: Methodological Foundations

Students who major in environmental and resource economics are qualified for a wide
variety of opportunities upon graduation. Private business, public institutions, and government agencies currently have a strong demand for specialists trained in natural resource development; land and water use policy; natural resource and small business management; agricultural, fisheries, and forestry marketing; and community development. In many cases, students may wish to improve their qualifications by pursuing more specialized graduate studies in one or more of the above areas.

Departmental Honors
Honors in environmental and resource economics will be awarded to students who complete 16 credits of honors courses in environmental and resource economics (including a minimum of four credits of a senior research project), and who maintain a minimum grade-point average of 3.20 in the major. Students interested in the environmental and resource economics honors program should contact the environmental and resource economics coordinator in James Hall for more information.

Students interested in a major or minor in environmental and resource economics should contact John M. Halstead, 324 James Hall, (603) 862-3914.

Environmental Sciences
www.unh.edu/envsci/
(For Natural Resources [NR] courses, see page 217.)
The College of Life Science and Agriculture (COLSA) and the College of Engineering and Physical Sciences (CEPS) jointly offer a bachelor of science degree in environmental sciences. Environmental sciences is an interdisciplinary field concerned with the interaction of biological, chemical, and physical processes that shape our natural environment. Students graduating with a degree in environmental sciences have an understanding of these interacting processes, the ability to effectively communicate with both scientific and lay audiences, competency in field methods appropriate for entry-level environmental science positions, competency in the use and application of Geographic Information Systems (GIS), a basic understanding of environmental policy, and the ability to contribute to multidisciplinary teams. The University of New Hampshire is a recognized leader in environmental sciences research, and the environmental sciences program capitalizes on faculty expertise in this area. The program has 12 full-time faculty members, with major teaching and research emphases in the areas of biogeochemical cycling, environmental chemistry, ecosystem science, global change, hydrology, plant ecology, soil science, and water resource management.

Employment opportunities include: environmental consulting firms; educational facilities (e.g., science centers); environmental monitoring laboratories (e.g., water treatment plants; the Environmental Protection Agency); government agencies (e.g., the U.S. Geological Survey, Bureau of Land Management, Natural Resource Conservation Service), university and government research laboratories, and nongovernmental environmental organizations. The environmental sciences program also constitutes an excellent preparation for graduate programs in several areas relating to the environment. Students should consult with their advisor early if their goals include further study.

Requirements
In addition to general education requirements, two introductory environmental science courses are required, including Environmental Pollution and Protection (ENE 520). Foundation courses include two semesters of chemistry (CHEM 403, 404) and calculus (MATH 425, 426), one semester of geology (ESCI 401, 402, or 409), one semester of statistics (MATH 644 or BIOL 528), and either two semesters of physics (PHYS 407,408), and one semester of approved biology or one semester of physics (PHYS 407) and two semesters of approved biology. Core courses include Techniques in Environmental Sciences (ESCI 534); Introduction to GIS (NR 658), Fate and Transport in the Environment (ESCI 656); Natural Resource and Environmental Policy (NR 602); and a capstone course (e.g., Senior Thesis). Students must complete an additional seven courses in one of the following options:

Ecosystems
NR 527, Forest Ecology OR BIOL 541, General Ecology
NR 730, Terrestrial Ecosystems
NR 765, Community Ecology
one approved course in taxonomy (e.g., NR 425)
three approved electives

Hydrology
ESCI 561, Surficial Processes
NR 501, Introduction to Soil Sciences or ESCI 512, Principles of Mineralogy
NR 604, Watershed Hydrology
ESCI 705, Principles of Hydrology
ESCI 710, Groundwater Hydrology
two approved electives

Soil and Watershed Management
NR 501, Introduction to Soil Sciences
NR 604, Watershed Hydrology
NR 703, Watershed Water Quality Management
NR 706, Soil Ecology
three approved electives

For a list of approved elective courses and for further information about the major, contact the program coordinator, Serita Frey, Department of Natural Resources, 226 James Hall, (603) 862-3880, eniro.sci@unh.edu.

Forestry
www.unh.edu/natural-resources/ug-for.html
(For Natural Resources [NR] courses, see page 217.)

Forestry is the art and science of managing and understanding the natural and human dimensions of forests and forest use. The forestry program is designed to provide graduating professionals with a sound technical preparation and a broad general education. The forest management and forest science options of the forestry major leading to the bachelor of science in forestry degree (B.S.F.) are accredited by the Society of American Foresters (SAF). The SAF is recognized by the Council on Postsecondary Accreditation and the U.S. Department of Education as the accrediting body for forestry in the United States.

Professional foresters are employed by private industry, public agencies, public interest firms, groups, educational institutions, research organizations, and consulting firms. Foresters manage forests, provide for wildlife habitat and forest recreation, protect water and soil resources, and assure a sustainable supply of forest products. Some graduates work toward natural resource protection and the improvement of environmental quality.

Forestry education at UNH focuses on ecosystem management for diversity, productivity and health, based on multidisciplinary collaboration. There are opportunities in international forestry. Many students enter graduate school for advanced training in forest biology or forest management.

Technical, administrative, and managerial skills are required of all professional foresters. This program provides a foundation in scientific knowledge, as well as technical and managerial skills, with elective freedom to cultivate special abilities and interests.

Forestry majors are required to have one summer of forestry work experience (NR 599). While students are responsible for their own summer work, placement assistance is available from the faculty.

In the junior year, students must choose to concentrate in either of the following options (and must earn 24 credits within that concentration to graduate):
Forestry Minor
Nonforestry majors may minor in forestry by completing 20 to 22 credits of coursework approved by the forestry program faculty.

General Science Certification
(See Department of Education and COLSA/ Degrees, pages 32 and 83.)

Genetics Program (GEN)
(For course descriptions, see page 185.)
There is no baccalaureate degree program in genetics. Undergraduates interested in genetics can pursue their interests within the context of any of the following B.S. degree programs: biology, animal sciences, biochemistry, microbiology, plant biology, or zoology. Undergraduate students alternatively can minor in genetics. See page 85 for the genetics minor requirements. For course entries in genetics, see course descriptions at www.undergradcat.unh.edu, under GEN, as well as relevant courses listed under the fore-listed departments and programs. Students interested in preparing for graduate work in genetics at UNH or elsewhere should contact the chairperson of the Genetics Program early in their undergraduate careers for advice on courses.

International Affairs (dual major)
(For program description, see page 111.)

Medical Laboratory Science (MLS)
www.mls.unh.edu
(For course descriptions, see page 211.)
The Medical Laboratory Science program provides students with a quality education in the fundamentals of biomedical laboratory science and laboratory skills in addition to a broad-based university general education. The curriculum enables students to determine the presence, extent, or absence of human disease and to provide the valuable data needed to evaluate the effectiveness of the treatment of human disease. The program also provides an excellent background for students intending to pursue careers in the medical field and upon completion of a clinical internship qualifies them to become certified medical technologists.

Baccalaureate degree holders in Medical Laboratory Science are not only highly sought after by hospitals but also by biotechnology companies, biomedical research facilities, and in the fields of forensic medicine, public health, and biological and chemical industry sales, service and education. Graduates of the program are also uniquely qualified to continue a post-baccalaureate education in a wide variety of disciplines and professional fields including medicine, health management and policy, business administration, education, microbiology, biochemistry, and in physician assistant programs.

Students may pursue a Bachelor of Science degree in MLS by following a clinical, research, or pre-professional curricula. Students obtain detailed curricula information in the Introduction to Medical Laboratory Science course (MLS 401) and in consultation with their academic advisers.

MLS-Clinical Curriculum
MLS majors following the clinical curriculum will complete MLS required courses and a 22-26 week clinical internship. Clinical internship positions are filled on established criteria published in the MLS Student Handbook, including professionalism, academic performance, interviews, and references.

Clinical students may become certified in all areas of the laboratory by completing courses in Advanced Clinical Microbiology (MLS 751), Advanced Hematology (MLS 752), Advanced Immunohematology (MLS 753), and Advanced Clinical Chemistry (MLS 754) during their internship. Upon successful completion of the clinical internship these students are awarded the B.S. degree and are eligible to take a national certification exam offered by the American Society of Clinical Pathologists (ASCP) or the National Certification Agency (NCA). Clinical students may choose to become certified in only one area of the clinical laboratory by completing either a Clinical Microbiology Internship (MLS 761), a Clinical Hematology Internship (MLS 762), a Clinical Immunohematology Internship (MLS 763), or a Clinical Chemistry Internship (MLS 764). Upon successful completion of the clinical internship these students are awarded the B.S. degree and are eligible to take a national certification exam offered by the ASCP or NCA in their categorical specialty area.

MLS-Clinical Curriculum Academic Requirements and Essential Functions
Students planning on participating in a clinical internship must obtain a grade of C or better in all MLS courses. These students must also have achieved a minimum 2.50 cumulative grade-point average (GPA) at the time of application for their clinical internship (junior year), and must maintain
that minimum until the internship begins. A personal interview at the clinical affiliate is required. This interview evaluates a student’s understanding of the profession, communication skills, maturity, self-confidence, and supervisory potential. Students must demonstrate these attributes to participate in the clinical courses.

The Medical Laboratory Science clinical curriculum is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). NAACLS requires students in this program to have the following essential functions: sound intellect; good motor skills; eye-hand coordination and dexterity; effective communication skills; visual acuity to perform microscopic analyses, or read procedures, graphs, etc.; professional skills such as the ability to work independently, manage time efficiently, and comprehend, analyze and synthesize various materials; as well as have sound psychological health and stability. Additional information regarding the essential functions listed above may be obtained by contacting the MLS program director.

**MLS-Research Curriculum**

MLS students following the research curriculum will complete MLS required courses and an undergraduate research project under a faculty mentor, presenting their findings at a UNH undergraduate research conference at the end of their senior year. Upon successful completion of the MLS research curriculum students are awarded the B.S. degree. While they are not eligible to take a national certification exam upon graduation they are qualified to seek a post-graduation clinical internship if they wish to attain certification as a medical technologist or a specialist.

**MLS-Pre-Professional Curriculum**

MLS majors following a pre-professional curriculum will complete MLS required courses and additional courses required by physician assistant programs or medical schools. Upon successful completion of the MLS pre-professional curriculum students are awarded the B.S. degree.

**Career Mobility Program**

This option is designed to make the B.S. degree in MLS available to certified laboratory assistants, medical laboratory technicians, military-trained laboratory personnel, and other individuals with at least two years of full-time recent experience in a clinical laboratory. Career mobility program participants may challenge MLS clinical course requirements through credit by examination. Written and practical examinations are available in the areas of clinical microbiology, clinical hematology, clinical immunohematology, clinical chemistry, and urinalysis/body fluids. Students interested in the career mobility program should contact the MLS Program director.

**MLS Minor**

Students may obtain a minor in MLS by successfully completing three MLS core courses and two additional approved electives for a minimum of 20 credits. Students interested in the MLS minor should consult the MLS Program director.

**MLS Fast Track**

This program is designed for students with a B.S. degree in a life science who wish to become eligible for certification as a medical technologist. The student must have a clinical sponsor to provide the clinical training. Students will take MLS theory classes in hematology, medical biochemistry, immunohematology, body fluids, mycology, parasitology, laboratory management, and molecular diagnostics, as well as any prerequisites, or background courses required for the program. Courses are taken through Education and Summer Studies, and no degree is conferred at completion. Contact the MLS Program director for more information.

**Required Courses**

- ANSC 512, Anatomy and Physiology
- ANSC 754, Molecular Diagnostics
- BIOL 411/412, Principles of Biology I and II
- BIOL 604, Principles of Genetics
- CHEM 403-404, General Chemistry
- CHEM 545/6 Organic Chemistry
- BCHM 658/9 General Biochemistry
- MICR 503, General Microbiology
- MICR 602, Pathogenic Microbiology
- BIOL 528, Applied Biostatistics I, or PSYC 402, Statistics
- or SOC 502, Statistics
- MLS 602, Seminar
- MLS 610, Biomedical Laboratory Management
- MLS 640, Phlebotomy Theory
- MLS 641, Phlebotomy Clinical Internship
- MLS 642/643, Basic Immunology/Serology Lab
- MLS 644/645, Hematology/Clinical Hematology Lab
- MLS 656/657, Immunohematology and Transfusion Science/Blood Banking Lab
- MLS 658/659, Medical Biochemistry/Clinical Chemistry Lab
- MLS 660/661, Body Fluids/Body Fluids Lab
- MLS 720/721, Mycology, Parasitology, and Virology/MVP Lab

**Microbiology (MICR)**

microbiology.unh.edu/

(For course descriptions, see page 212.)

Microbiology explores the world of organisms too small to be seen with the unaided eye. The primary emphasis in the Department of Microbiology is on prokaryotes (bacteria and archaea) and viruses. The curriculum provides basic familiarity with microorganisms, their interactions with other life forms (including humans), and their roles in natural systems and processes.

Baccalaureate degree holders in Microbiology secure positions in industry (food and beverage, pharmaceutical, bioproducts, etc.); in city, state, and federal agencies (public health, environmental quality, regulatory, etc.); or in universities or research institutes.

The Department of Microbiology offers programs of study leading to the bachelor of science degree. Microbiology is widely recognized as being both a basic life science and a highly pragmatic applied science. The curriculum within the microbiology program is intended to accommodate the diverse needs of potential students. It provides solid training for individuals intending to enter the workforce or to pursue graduate education in the biological sciences, biomedicine, or biotechnology. It also provides for entry into professional programs such as dentistry, human medicine, or, with little additional preparation, veterinary medicine. The curriculum is appropriate for students planning to enter the workforce immediately upon graduation, as research technicians, applied scientists, or in sales or marketing positions in the life sciences or biotechnological industry. The curriculum is also appropriate for transfer students and those planning to pursue a degree in business, including the M.B.A., for careers in managing diagnostic laboratories or in hospital administration.

Other microbiology-related courses offered in the following programs may be taken with an adviser’s permission: animal sciences, biochemistry and molecular biology, plant biology, civil engineering, zoology, or medical laboratory science. Courses in these areas are reviewed periodically by the microbiology faculty to ascertain their suitability for microbiology majors.

Special Problems in Microbiology (MICR 795) is available by permission and allows students the opportunity to conduct semi-independent research projects in conjunction with departmental faculty. Up to 4 credits of Problems in Microbiology may be applied to major requirements, although students may enroll for additional hours. Students must receive a minimum grade of
C in major requirements taught in the College of Life Sciences and Agriculture (e.g., microbiology, biology, or biochemistry). A passing grade in major requirements taught outside the College of Life Sciences and Agriculture (e.g., chemistry, math, or physics) is acceptable.

Students planning to attend graduate or postgraduate professional school or to apply for certification as registered microbiologists through the American Society for Microbiology are strongly advised to take a course in quantitative analysis (CHEM 517-518).

Individuals considering a major in microbiology are strongly encouraged to enroll in MICR 503 and organic chemistry in their sophomore year. Requirements in the biology core curriculum may be deferred until the subsequent year, if necessary.

Students may obtain a minor in microbiology by successfully completing MICR 503 and four additional departmental courses totaling a minimum of 20 credits at the 600 or 700 level. Students must receive a minimum grade of C in major requirements taught in the College of Life Sciences and Agriculture (e.g., microbiology, biology, or biochemistry). BCHM 658/659 may be substituted for one of these courses. A maximum of 4 credits of Problems in Microbiology may be applied to the minor.

Microbiology Curriculum

The microbiology curriculum is satisfied by Group I and Group II course requirements. All Group I courses are required. Two courses from the Group II requirements are also required. The microbiology major B.S. degree requirement is seven microbiology courses totaling a minimum of 28 credit hours at a grade of C or above.

Group I Requirements
Biol 411-412, Principles of Biology I and II
BCHM 658/659 General Biochemistry
or BCHM 751-752, Principles of BCHM with BCHM 755 (lab)
CHEM 403-404, General Chemistry
CHEM 651/653 Organic Chemistry
or CHEM 545/546
PHY 401-402, Introduction to Physics I and II
MATH 424B, Calculus for Life Sciences,
or MATH 425, Calculus for Life Sciences
or MATH 428, Calculus for Life Sciences,
or MATH 429, Calculus for Life Sciences
BIOL 604, Principles of Genetics
MICR 503, General Microbiology
MICR 504, Brewing and Industrial Microbiology
MICR 517, Microbial Physiology
A microbial ecology course (this requirement may be fulfilled by taking either MICR 707 or MICR 713)

Group II Requirements
Two additional microbiology courses are required from the following courses:
MICR 710, Electron Microscopy and Microbial Cytology
MICR 711, Genomics and Bioinformatics
MICR 718, Ethics and Issues in Microbiology
MICR 751, Cell Culture
MICR 702, Infectious Disease and Health
MICR 706, Virology (and 708, Laboratory)
MICR 714, Public Health and Waterborne Diseases
MICR 705, Immunology
MICR 707, Marine Microbiology
MICR 713, Microbial Ecology & Evolution
MICR 766, Plant-Microbe Interactions
NR 706, Soil Ecology

Electives
(These cannot be taken to fulfill the microbiology major requirement.)
MICR 504, Brewing and Industrial Microbiology
Applications (UNHM)
MICR 600, Field Experience
MICR 603, Microbiology of Food (UNHM)
MLS 720, Mycology, Parasitology, and Virology
PBIO 721, Microscopic Algae
PBIO 725, Mycology
MICR 790, Laboratory Teaching Experience
MICR 795, Problems in Microbiology

Natural Resources (NR)
(For course descriptions, see page 217.)

Nutritional Sciences (NUTR)
www.anscandnutrition.unh.edu/
(For course descriptions, see page 222.)

Professors: Gale B. Carey, Joanne Curran-Celentano, Anthony R. Tagliaferro
Associate Professors: Dennis J. Bobilya, Colette H. Janson-Sand
Affiliate Associate Professor: Mark R. Windt, M.D.
Clinical Assistant Professors: Joanne D. Burke, Ruth A. Reilly
Lecturers: Ingrid Loefgren, Jesse Stabile Morrell
Extension Professor: Catherine A. Violette

The science of nutrition is the study of nutrients in food and the body's handling of these nutrients. As an applied science, nutrition is based on biochemistry and physiology but can also include anthropology, economics, genetics, microbiology, pathology, animal sciences, and zoology. Consequently, the nutritionist often cooperates with workers in many different fields. The nutrition program at UNH is designed to permit specialized study in human and/or animal nutrition.

Two curricula are offered to meet the educational needs of students with differing professional aspirations.

Basic Science Curriculum

This curriculum provides students with a solid science background in biology, chemistry, physiology, nutrition, biochemistry, and physics. Upon graduation, students are well-prepared for technically oriented jobs in science. This curriculum is also excellent preparation for students planning further education in graduate school or professional schools of medicine and dentistry. Students in this curriculum are required to complete the biology core curriculum and NUTR 400 and 750; ANSC 511/512 or ZOOL 507/508; MICR 503; BCHM 658/659; and 12 additional credits from recommended courses in nutrition.

Dietetics Curriculum

Approved by the American Dietetics Association (ADA), the dietetics curriculum prepares students to apply for a post-graduate dietetic internship. Completing this internship and passing the ADA examination are essential for becoming a registered dietitian (RD), requisite for employment opportunities in clinical dietetics and community nutrition. Required courses for this curriculum are NUTR 400, 401, 405, 476, 504, 510, 550, 650, 720, 750, 773, 775, and 780; ZOOL 507/508; BIOL 411; CHEM 403/404, and 545/546; ENGL 401; HMG 403; MICR 501 or 503; BCHM 658/659; SOC 500 or PSYC 401; HEMP 710; and either PSYC 402, SOC 502, BIOL 528, or HHS 540.

Plant Biology (PBIO)
www.pbio.unh.edu/
(For course descriptions, see page 227.)

Plant biology is the study of plants at the population, organismal, cellular, and molecular level; and the investigation of the uses of plants for food, fiber, recreational, and ornamental purposes. Offerings in marine and freshwater plant biology also are provided and are facilitated by the Jackson Estuarine Laboratory and two marine laboratories where the plant biology faculty

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1 For students transferring into the microbiology major, the equivalent of two semesters of a laboratory biological science may be accepted with microbiology faculty approval.
2 Premedical and other pre-health students should take one year of organic chemistry.
3 Classes recommended for the major.
maintains an active involvement in teaching and research. The Department of Plant Biology offers three baccalaureate degrees: bachelor of science in plant biology, bachelor of science in environmental horticulture, and bachelor of arts in plant biology. See also programs listed under biology major and marine sciences.

B.S. in Plant Biology

This degree is for students intending to seek employment in agricultural, pharmaceutical, and biotechnology industries; to work in governmental agencies, environmental groups, and consulting firms; to teach secondary education; or to undertake graduate studies in preparation for advanced research and teaching positions. Students interested in university teaching and/or research, and governmental and industrial research, should plan to complete an advanced degree in the field.

Students are required to take the core courses, which include the biology core curriculum, and five plant biology elective courses.

Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 411, Principles of Biology I</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 412, Principles of Biology II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 403, General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 404, General Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 424B, Calculus for Life Sciences</td>
<td>4</td>
</tr>
<tr>
<td>MICR 503, General Microbiology</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 541, General Ecology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 528, Applied Biostatistics I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 545/546, Organic Chemistry and Laboratory</td>
<td>5</td>
</tr>
<tr>
<td>BCHM 658/659, General Biochemistry and Laboratory</td>
<td>5</td>
</tr>
<tr>
<td>PHYS 401, Introduction to Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 402, Introduction to Physics II</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 604, Principles of Genetics</td>
<td>4</td>
</tr>
<tr>
<td>PBIO 401, Plant Biology Orientation</td>
<td>4</td>
</tr>
<tr>
<td>PBIO 701/702, Plant Physiology and Laboratory</td>
<td>5</td>
</tr>
<tr>
<td>PBIO 758, Plant Anatomy</td>
<td>5</td>
</tr>
<tr>
<td>PBIO 774, Plant Biotechnology and Genetic Engineering</td>
<td>3</td>
</tr>
<tr>
<td>PBIO 566, Systematic Botany</td>
<td>4</td>
</tr>
<tr>
<td>or PBIO 668, Summer Flora of New Hampshire</td>
<td>4</td>
</tr>
</tbody>
</table>

Plant Biology Electives

Five additional courses must be selected from those listed under categories 1-5. No more than three courses from any one category can be used to fulfill the requirement. It is strongly recommended that students choose courses from as many of the categories as possible to obtain a broad background in plant biology. Core courses cannot be used to fulfill elective requirements. PBIO 795, Investigations in Plant Biology can be used once to fulfill one of the five electives, if taken for 3 or more credits. PBIO 796, Special Topics in Plant Biology can be used to fulfill elective requirements, if taken for 3 or more credits and preapproved by adviser.

Category 1: Systematics, Ecology, and Evolution

PBIO 566, 625, 668, 717, 719, 721, 722, 723, 747, 752, 761
ZOOL 545; NR 713, 765

Category 2: Marine and Freshwater Plant Biology

PBIO 503, 625, 717, 719, 721, 722, 725, 727/729, 747

Category 3: Plant Structure and Physiology

PBIO 709, 713, 714/715, 727/729, 775

Category 4: Environmental Horticulture

NR 506; PBIO 546, 547, 565, 572, 650, 651, 652, 678, 689, 726; ZOOL 745

Category 5: Plant Genetics, Cell Biology, and Biotechnology

BCHM 771; GEN 705; PBIO 751, 753, 754, 766, 772, 775

B.A. in Plant Biology

The curriculum provides a broad background in the liberal arts and plant biology. Students may enter this program as freshmen or transfer into it from other liberal arts or science programs. This program is of particular interest to students who intend to utilize their plant biology training in public relations, teaching, or other related careers in combination with a liberal arts background. The program allows students to obtain minors in other fields such as English, history and philosophy of science, international affairs, education, art, etc., to create an interdisciplinary program, or to pursue a double major. Students must complete a minimum of 40 semester credits in the major, including:

B.A. Degree Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBIO 401, Plant Biology Orientation</td>
<td>1</td>
</tr>
<tr>
<td>PBIO 412, Introductory Botany*</td>
<td>4</td>
</tr>
<tr>
<td>ZOOL 412, Biology of Animals</td>
<td>4</td>
</tr>
<tr>
<td>PBIO 501, Basic Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>or CHEM 545/546, Organic Chemistry and Laboratory</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 541, General Ecology</td>
<td>4</td>
</tr>
<tr>
<td>PBIO 566, Systematic Botany</td>
<td>4</td>
</tr>
<tr>
<td>or PBIO 668, Summer Flora of New Hampshire</td>
<td>4</td>
</tr>
<tr>
<td>or PBIO 721, Microscopic Algae</td>
<td>4</td>
</tr>
<tr>
<td>or PBIO 722, Marine Physiology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 604, Principles of Genetics</td>
<td>4</td>
</tr>
<tr>
<td>or PBIO 612, Plant Genetics and Reproduction</td>
<td>4</td>
</tr>
<tr>
<td>or PBIO 701/702, Plant Physiology and Laboratory</td>
<td>5</td>
</tr>
</tbody>
</table>

*waived if previous credit received for BIOL 411-412 or equivalent

Upper Level Plant Biology Category Electives

12 credits minimum

Select courses from several of the five plant biology categories (see B.S. program). PBIO 758 and 774 are also recommended.

Required General Education Courses

Required: Group 3, CHEM 403-404, General Chemistry

Recommended: Group 2, BIOL 528, Applied Biostatistics I

Group 8, PHIL 424, Science, Technology, & Society; or HUMA 651, Humanities and Science: The Nature of Scientific Creativity

Other B.A. Requirements

Foreign language (equivalent to one year of college language).

Minors

The Department of Plant Biology offers two departmental minors: a minor in plant biology and a minor in environmental horticulture. These minors are available to all students and are designed to provide a flexible and broad selection of courses to complement any other major area of study.

The requirements for the plant biology minor are

PBIO 401, PBIO 412 or equivalent, and a minimum of 15 credits from the following list of courses: PBIO 566, 625, 651, 653, 668, 701/702, 709, 713, 717, 719, 721, 722, 725, 727, 729, 751, 752, 753, 754, 758, 761, 772, 774/775, 795 (maximum of 4 cr.), 796, 799; BIOL 601

The requirements for the environmental horticulture minor are

PBIO 401, PBIO 421, and a minimum of 15 credits from the following list of courses: PBIO 405, 547, 565, 566, 572, 612, 650, 651, 652, 653, 678, 679, 689, 701/702; BIOL 601.

For advice on course selection, students should see the department chairperson.

Departmental Honors

Honors in plant biology or environmental horticulture will be awarded to students who complete 16 credits of honors courses in plant biology courses (including a minimum of four credits in a senior honors thesis project), and maintain a minimum grade-point average of 3.20 (overall average and in major coursework). Students wishing to apply to the departmental honors program should consult with Professor Estelle Hrabak.

General Science Certification

(See Department of Education and COLSA/ Degrees, page 32 and 83.)

Tourism Planning and Development (TOUR)

www.dred.unh.edu/undergraduate/tour.html

For course descriptions, see page 245.)

Tourism creates immense economic activity, totaling more than $4 trillion dollars of world spending. Tourism is also an integral part of New England’s economy. Experience has shown that the public and private sectors of the tourism industry benefit substantially from proper planning. Those locations with the best planned and managed tourism...
developments are likely to be the most successful tourist destinations from the standpoint of providing both high-quality tourist experiences and bringing substantial economic benefits with minimal disruptions to the social and natural environment. In response to these needs, the Department of Resource Economics and Development offers a bachelor of science degree in Tourism Planning and Development from regional and international perspectives.

The Tourism Planning and Development curriculum provides students with the skills and knowledge necessary to plan, develop, and manage natural, cultural, and financial resources in an environmentally responsible manner. The program utilizes an interdisciplinary approach to provide students with a strong liberal education supplemented by a broad professional understanding of tourism planning and its role in local, state, national, global economic, and social development. Students study both the social and environmental sciences in order to better understand the complexity of natural and social systems. The program emphasizes the practical application of planning and economic theory to the planning for the development of tourism resources.

**Curriculum Structure**

All majors must complete a core curriculum and choose one of two concentrations: international development or regional tourism planning.

**Core Courses**
The core curriculum is composed of the following courses:

- **TOUR 400**, Introduction to Tourism
- **EREC 411**, Environmental and Resource Economics Perspectives
- **EREC 501**, Agriculture and Natural Resource Product Marketing
- **EREC 525**, Statistical Methods and Applications
- **CD 614**, Fundamentals of Planning
- **TOUR 615**, Tourism Planning and Development
- **TOUR 633**, Economics of Travel and Tourism
- **TOUR 560**, Special Topics (8 credits)
- **TOUR 700**, Marketing Communications Research: Methodological Foundations
- **TOUR 705**, Ecotourism: Managing for the Environment or **TOUR 767**, Social Impact Assessment or **CD 777**, Topics in Community Planning
- **TOUR 794**, Tourism Internship
- **TOUR 794** involves a 14–16 week, full-time, supervised (40 hrs.) internship, and enables students to meet and work in association with representatives from the public and private sectors of the tourism industry.

**International Tourism Development Concentration**

This concentration area prepares students to work in the dynamic and challenging environment of international tourism development. Depending on interests, language skills, and international experiences, students may expect to find employment in settings such as national tourism offices, international tourism organizations, national and foreign consults, and multinational tourism destination resorts. In addition to the required core courses, students who pursue the international tourism development concentration must complete the following requirements: **TOUR 792**, International Experience; two **TOUR** electives; and two additional electives that will enhance students' career opportunities in the international area.

**Regional Tourism Planning Concentration**

This concentration area prepares students to obtain professional roles in planning in the public or private sectors of the tourism industry. Depending on interests and technical skills, students may expect to find employment in settings such as local and regional economic development organizations, chamber of commerce offices, convention and visitor bureaus, state and federal offices of tourism development, local and regional planning commissions, and resort communities. In addition to the required core courses, students who pursue the regional tourism planning concentration must complete the following requirements: **TOUR 798**, Independent Study in Tourism; two **TOUR** electives; and all the requirements for a minor in community planning.

**Wildlife Ecology**

[www.unh.edu/natural-resources/ug-wild.html](http://www.unh.edu/natural-resources/ug-wild.html)

The wildlife curriculum is for students interested in the ecology, conservation, and management of wild animals. It is designed to provide a knowledge of wildlife species and their various forest, field, and wetland habitats. Students are prepared for employment with public and private agencies in wildlife conservation and management, or for continued study at the graduate level.

Fieldwork is carried out during the academic year on local and regional wildlife populations. Majors are assisted and encouraged to obtain summer employment related to wildlife and natural resources.

The degree earned is a bachelor of science with a major in wildlife ecology. The program is administered in the Department of Natural Resources.

**Freshmen Year**

- **BIOL 411**, Principles of Biology I
- **BIOL 412**, Principles of Biology II
- **ENGL 401**, First Year Writing
- **MATH 424B**, Calculus for Life Sciences, or **MATH 420**, Finite Mathematics
- **NR 400**, Professional Perspectives in Natural Resources
- **NR 401**, Introduction to Natural Resources
- **NR 425**, Field Dendrology
- **NR 433**, Wildlife Ecology
- **Elective**, physical science or General Education elective

**Sophomore Year**

- **BIOL 528**, Applied Biostatistics I
- **BIOL 538**, Wildlife Policy and Management
- **BIOL 541**, Conservation Genetics
- **CD 501**, Introduction to Creative Nonfiction, or **ENGL 502**, Technical Writing, or **ENGL 503**, Persuasive Writing
- **EREC 411**, Environmental and Resource Economics Perspectives
- **NR 527**, Forest Ecology, or **BIOL 541**, General Ecology
- **NR 655**, Vertebrate Biology
- **NR 658**, Introduction to Geographic Information Systems
- **ZOOL 542**, Ornithology, or **ZOOL 712**, Mammalogy, or **Elective**

**Junior Year**

- **NR 602**, Natural Resources and Environmental Policy
- **NR 615**, Wildlife Habitats
- **NR 737**, Wildlife Population Dynamics
- **ZOOL 625**, Principles of Animal Physiology
- **ZOOL 665**, Conservation Genetics
- **ZOOL 710**, Ichthyology, or **ZOOL 713**, Animal Behavior, or **ZOOL 733**, Behavioral Ecology
- **Elective**

**Senior Year**

- **NR 629**, Silviculture or equivalent
- **NR 636**, Wildlife Techniques
- **NR 738**, Wildlife Policy and Management
- **Elective**
- **Elective**
- **Elective**

Electives should be used to satisfy remaining general education requirements and the wildlife major requirements in the areas of communication skills and physical sciences (one course in each area–pertinent courses are listed in the detailed wildlife curricular guidelines available from the department).

Students interested in the Wildlife Ecology major may consult with the program coordinator, Peter Pekins, James 214, (603) 862-1017.
General Science Certification
(See Department of Education and COLSA/Degrees, pages 32 and 83.)

Zoology (ZOOL)
zoo.unh.edu/
(For course descriptions, see page 246.)

The Department of Zoology has a primary responsibility for undergraduate and graduate instruction in fundamental aspects of animal biology, including the principles of form, function, development, and diversity produced by animal evolution. The teaching program provides a broad coverage of basic biological processes in invertebrate and vertebrate animals at the cellular, organismic, population, and community levels. Students receive background for a variety of professional positions in the public and private sector, and for graduate programs in the biological sciences including health-related fields. The department offers the bachelor of arts, bachelor of science, master of science, and doctor of philosophy degrees. Zoology faculty contribute significantly to the biology core curriculum, marine biology minor, animal behavior minor, genetics program, University honors program, ocean projects, and undergraduate research opportunity programs, and courses at the Shoals Marine Laboratory.

There is a strong teaching and research emphasis on ecological and physiological processes in aquatic animals or ecosystems. This focus is enhanced by the geographical location of the University and the availability of facilities for aquatic research. The University’s location and facilities provide unique opportunities for the study of aquatic and terrestrial animals due to its access to the seacoast and the lakes region of New Hampshire, the White Mountain National Forest, and the presence of two coastal marine laboratories, as well as estuarine and freshwater laboratories.

The zoology major builds from the common background of the biology core curriculum, with ample time for third- and fourth-year students to concentrate in specialized disciplines such as marine and freshwater biology, behavior, cell and developmental biology, ecology, evolution, fisheries, physiology, and neurobiology. Zoology majors must complete 32 credits from courses in the biological sciences approved by the department with a 2.00 average. Students must receive a minimum grade of C- in major requirements taught in the College of Life Sciences and Agriculture (e.g., zoology, microbiology, biology, biochemistry). A passing grade in major requirements taught outside the College of Life Sciences and Agriculture (e.g., chemistry, mathematics, physics) is acceptable. Minimum requirements for the B.S. in zoology are as follows: completion of the biology core courses and required courses in animal morphology, physiology and development, plus advanced electives in zoology and other biological sciences. The B.A. in zoology has a foreign language requirement in lieu of one advanced elective. B.A. students also have somewhat more flexibility when choosing courses from the biology core.

New England Regional Student Program
The bachelor’s degree in Zoology is one of the specialized curricula recognized by the New England Board of Higher Education and participates in the New England Regional Student Program. Under this program, students from the state of Massachusetts receive some preferential admission consideration and, if admitted, pay the UNH in-state tuition rate plus 75 percent. Students who are interested in a zoology major should consult the department’s undergraduate adviser or chair.

General Science Certification
(See Department of Education and COLSA/Degrees, pages 32 and 83.)

Departments

Animal and Nutritional Sciences

Majors: Animal Science (Bioscience and Technology, Equine Sciences, Previtinary Medicine), Dairy Management, Medical Laboratory Science, Nutritional Sciences

Chairperson: Thomas L. Foxall

Animal Sciences Faculty

Affiliate Professors: Ronald E. Rompalla, Martin Stokes

Clinical Professors: Joseph J. Moore, Roger E. Wells

Associate Professors: Patricia D. Bedker, Elizabeth B. Boulton, Peter S. Erickson, David H. Townsend, Paul C. Tsang

Affiliate Associate Professors: John A. Ryan, Arthur F. Stucchi

Biochemistry and Molecular Biology

Major: Biochemistry

Chairperson: Anita S. Klein

Professors: Rick H. Cote, Clyde L. Denis, Thomas M. Laue, Stacia A. Sower

Research Professor: Vernon N. Reinhold

Affiliate Professors: William G. North, Stuart A. Tobet

Affiliate Associate Professors: John J. Collins, Anita S. Klein, Andrew P. Laudano, W. Kelley Thomas

Chairperson: Jennifer A. Durant

Research Assistant Professors: Kevin M. Culligan, Jennifer A. Durant

Affiliate Professor: Thomas P. Moody

Microbiology

Major: Microbiology

Chairperson: Aaron B. Margolin

Professors: Aaron B. Margolin, Thomas G. Pistole, Frank G. Rodgers

Associate Professor: Louis S. Tisa

Assistant Professors: Vaughn S. Cooper, Elise R. Sullivan, Cheryl A. Whistler

Adjunct Faculty: Steven D. Torosian
Natural Resources

Majors: Environmental Conservation Studies, Environmental Sciences (Hydrology, Soil and Watershed Management, Ecosystems), Forestry (Forest Management, Forest Science), Wildlife Ecology

Chairperson: Mimi Larsen Becker
Research Professor: Frederick T. Short
Affiliate Professors: Christopher Eagar, Jeffrey H. Gove, Jeffrey S. Kahl, William B. Leak, Changsheng Li, Rakesh Minocha
Associate Professors: Kimberly J. Babbitt, Mimi Larsen Becker, Mark J. Ducey, Serita D. Frey, Kelly L. Giraud, George C. Hartt, Paul C. Johnson, Thomas D. Lee, Jonathan R. Pennock
Research Associate Professors: David M. Burdick, Stephen H. Jones
Affiliate Associate Professors: Linda S. Heath, Peter A. Maddison, Lawrence J. Frelli
Assistant Professor: Scott V. Ollinger
Research Assistant Professor: Adrienne I. Kovach
Affiliate Assistant Professors: Mathew J. Baber, Ria Brejaart, John L. Campbell, Andrew B. Cooper, Richard Hallett, Erik A. Hobbie, Mary C. Martin, Mariko Yamasaki, Bruce S. Wildblood-Crawford
Adjunct Faculty: Bernard Cohen, Richard J. deSeve, Sidney A.L. Pilgrim
Extension Professors: Karen P. Bennett, Frank S. Mitchell, Sarah S. Smith
Extension Associate Professors: Darrell F. Covell, Julia P. Peterson

Resource Economics and Development

Majors: Community and Environmental Planning, Environmental and Resource Economics, Tourism Planning and Development

Community and Environmental Planning Faculty
Coordinator: Kelly L. Giraud
Professors: John M. Halstead, Bruce E. Lindsay
Associate Professors: Kelly L. Giraud, Alberto B. Manalo, Douglas E. Morris, Robert A. Robertson
Instructor: Mary Adano Robertson
Extension Assistant Professor: Charles A. French

Environmental and Resource Economics Faculty
Coordinator: John M. Halstead
Professors: Lyndon E. Goodridge, John M. Halstead, Bruce E. Lindsay
Associate Professors: Kelly L. Giraud, Alberto B. Manalo, Douglas E. Morris
Research Assistant Professor: Troy W. Hartley

Tourism Planning and Development Faculty
Coordinator: Robert A. Robertson
Professors: Lyndon E. Goodridge, John M. Halstead, Bruce E. Lindsay
Associate Professors: Kelly L. Giraud, Alberto B. Manalo, Robert A. Robertson
Instructor: Mary Adano Robertson
Extension Professor: Michael R. Sciabarrasi

Zoology

Major: Zoology

Chairperson: James F. Haney
Research Professor: Michael Lesser
Associate Professors: David L. Berlinsky, Jessica A. Bolker, James E. Byers, Raymond E. Grizzle, Marianne Klaus Breier Litvaitis
Research Associate Professors: Raymond E. Grizzle, Molly Lutucavage
The Whittemore School of Business and Economics prepares students for future careers in management, public service, research, and education. The liberal arts are the basic foundation of the curriculum, and management of change in a global community is the major emphasis. Each department and program has its unique disciplinary tradition and the simultaneous commitment to broad educational excellence in critical thought, verbal and written communications, quantitative skills, computer literacy, and ethical reasoning. International awareness and cross-cultural understanding are essential components of the educational experience of Whittemore School students. The educational process encourages the integration of practice and theory through student interaction with business, public agencies, and faculty research.

The Whittemore School's undergraduate curricula combine a breadth of liberal education with specific professional education in business administration, economics, and hospitality management. Undergraduates enrolled in the Whittemore School programs take a substantial part of their coursework, normally over 50 percent, in other colleges in the University in order to fulfill the general education requirements. Beyond those requirements, students are encouraged to elect additional courses in the arts, the behavioral and social sciences, the humanities, mathematics, and the natural sciences. Thus, students who complete the Whittemore School programs in business administration, economics, and hospitality management are prepared for employment and graduate study in both these and adjacent fields.

The Whittemore School offers a minor in business administration, economics and in hospitality management. Within the limits of its resources, the Whittemore School also serves the needs of undergraduates elsewhere in the University for whom selected courses in business administration, economics, or hospitality management are desirable complements to their primary course of study. To the extent that space is available after majors have enrolled, a limited number of Whittemore School courses are open to nonmajors who have the prerequisite preparation.

A maximum of 32 credits in courses offered by the Whittemore School of Business and Economics may be taken by non-Whittemore School students.

Degree Requirements

The Whittemore School offers a bachelor of arts degree program in economics and bachelor of science degree programs in business administration, economics, and hospitality management. Students who desire a professional career in public accounting are advised to follow the five-year program leading to a bachelor of science in business administration and a master of science in accounting degree (see Accounting Program of Study, page 103, for details). Application for admission to this highly selective program is made in the junior year.

Course listings for business administration are found under accounting and finance (ACFI), business administration (ADMN), decision sciences (DS), management (MGT), and marketing (MKTG). Candidates for a degree must satisfy all of the University general education requirements for graduation as well as the particular requirements of their individual major programs. In addition, candidates must complete a math course (400 level). Economics majors must also satisfy specific requirements associated with the bachelor of arts degree (see Degree Requirements). No Whittemore School course may be repeated and each course may be repeated at most one time.

In order to graduate, students must achieve a grade-point average of at least 2.30 (2.00 for the B.A. in economics) in the major courses and a minimum grade of C- (for ADMN 403, students must obtain credit) in each major course. Any WSBE major required course in which a grade below C- is obtained must be repeated. No more than two WSBE courses may be repeated and each course may be repeated at most one time.

Modifications tend to occur in major programs during the four-year period of a student's undergraduate career. Students are expected to conform to these changes. Students transferring into the Whittemore School from other universities must have business, economics, and hospitality management courses reviewed and approved by the faculty through the Whittemore School Undergraduate Programs Office to be con-
Advising System
Undergraduate advising in the Whittemore School is carried out jointly by academic advisers and the faculty. The academic advisers are based in the Whittemore School Undergraduate Programs Office, where student academic records are kept. The advisers assist students in program planning, preregistration, understanding and meeting general academic requirements, and general academic and career decision making. In addition, the advisers coordinate study abroad and domestic exchange and honors programs. The faculty draw on their own experience, expertise, and interests in helping students with course, program, and career selection.

The peer advising system, established in 1984, was created for the purpose of introducing freshman to the college experience. Students complete a one-credit, credit/fail course each semester (ADMN 405/406, Freshman Academic Experience I/II), led by selected upper class students under the direction of faculty. The courses' goals are to familiarize students with their major, college, and University; to introduce students to the nature of academic knowledge, academic standards, and academic/personal management skills essential for success in the University; to provide discussion of a common topic or book; to support students in their personal growth; to develop personal responsibility; and to encourage freshman to use the advising services on campus.

Undergraduates are encouraged to develop an advisory relationship with one or more faculty members with whom they have mutual interests. All students are urged to seek as much assistance as they need, from whatever source, but are reminded that theirs is the ultimate responsibility for knowing and meeting the various academic requirements for a degree.

Independent Study/Internship
Juniors or seniors in the Whittemore School may elect the internship or independent study course for variable credit. For either course, the student must secure a faculty sponsor in the area of interest and submit a written proposal prior to the start of the semester in which the project is to be undertaken. Independent study normally involves research, while internships are usually undertaken with cooperation of an off-campus organization and involve a non-routine but practical application of skills and concepts acquired in a student's program.

Independent studies and internships require considerable self-direction and self-monitoring on the part of the student, who must be in high academic standing. Careful prior review of requirements with the undergraduate adviser is necessary. Students may earn no more than 16 credits in internships, independent studies, field experience, and supervised student teaching experience.

The Washington internship, a semester of supervised work experience in Washington, D.C., is open to any major.

International and Exchange Programs
The Whittemore School encourages qualified students to participate in programs of international work and study. The Whittemore School has international exchanges including Grenoble, France, Switzerland and Budapest, Hungary; and Glion, Switzerland.

Students may also elect to take a dual major in international affairs, offered in conjunction with the program for international perspectives (see page 111).

Information on all other international programs can be obtained from the sponsoring department or the Center for International Education, Hood House, Room 204.

Five-Year Programs
Four-One Program: B.S.-M.S.A.
The American Institute of Certified Public Accountants (AICPA), the national association of professional accountants, has mandated that five years of university education be required for national Certified Public Accountant (CPA) certification as of the year 2000. Most states have approved similar requirements for licensing/certification. The Whittemore School offers a five-year program designed for students who desire a professional accounting career. The program leads to the joint awarding of a bachelor of science in business administration and a master of science in accounting degree. Application for admission to this highly selective program is made in the junior year. Details are provided in the Programs of Study sections of this catalog and the Graduate Catalog.

Nonmajors
The Whittemore School also offers courses for nonmajors. Students interested in these courses should contact the undergraduate programs office.

Minor
The Whittemore School faculty has developed a group of courses for nonmajors that, if available and when combined with certain elective courses, can constitute a minor in business administration. A list of minor requirements is available at the Whittemore School Undergraduate Programs Office, Room 120, McConnell Hall.

Programs of Study
Business Administration (ADMN)
wsbe.unh.edu/WSBE_Undergrad-Progs/undergrad_progs.cfm
(For course descriptions, see page 146.)
The business administration program provides training for individuals interested in managerial or administrative careers in business or in public or private institutions.

Since most graduates of the program embark upon business careers, the program emphasis is in that direction. However, the skills acquired through the business program are readily applicable to the problems faced by not-for-profit institutions such as hospitals, school systems, government departments, and other socially oriented organizations, the program's objectives have been broadened to include all types of administration.

The curriculum offers professional education in the basic theories, principles, concepts, and analytical tools used by successful modern administrators, combining them with an introduction to the functional areas of management. Additionally students develop expertise in a particular area of business by earning an option within the business administration degree program. At the same time, typical students achieve a well-rounded education by selecting courses in the liberal arts and the sciences from other colleges and schools in the University.

The business administration program comprises ten four-credit business administration courses (ADMN prefix) representing foundational business knowledge and skills, one 1-credit business administration course to develop and demonstrate proficiency with computer applications, two four-credit economics courses (ECON prefix), and one
400-level course in mathematics (MATH prefix). All but one of these required courses are generally completed in the first five semesters of enrollment at WSBE, leaving the student with the flexibility in the final three semesters at WSBE to earn an option in one of the offered areas. University general education requirements and other non-WSBE classes are generally taken throughout a student's time at UNH.

While taking the ten core business administration courses, a student will gain an introduction to all of the major areas of business. Using this knowledge, students decide upon an area of business in which they desire to concentrate. Within the business degree program, students must designate an option. The latest a student may declare an option is during the fall semester of their junior year, typically during preregistration for spring courses. Students are encouraged to discuss their interests with several faculty members and an academic advisor in this decision-making process. The options currently offered in the business administration program are listed here. Due to the dynamic nature of the business world, the portfolio of options offered may change from time to time. Students are expected to stay abreast of these changes, through WSBE's Undergraduate Programs Office.

**Options in the Business Administration Program:**

**Accounting**

**Entrepreneurial Venture Creation**

**Finance**

**Information Systems Management**

**International Business and Economics**

**Management**

**Marketing**

**Student-Designed**

Options comprise a minimum of four courses, but requirements do vary by option. Due to the specialized nature of some career fields, course requirements are greater in some options than others.

A typical plan of study follows. The options have different requirements, which are provided later. However, a detailed schedule of study for each option is not provided here. Students should check with the WSBE Undergraduate Programs Office for specific recommendations regarding scheduling of courses in the option areas and the suggested plan of study.

**Freshman: Fall**

- ADMN 400, Introduction to Business
- ADMN 403, Computing Essentials for Business (1 credit, credit/fail grading)
- ADMN 405, Freshman Academic Experience I (1 credit, credit/fail grading)
- ECON 401, Macro Economics or 402, Micro Economics
- MATH 420, Finite Math or 424A, Calculus for Social Sciences

**Freshman: Spring**

- ADMN 406, Freshman Academic Experience II (1 credit, credit/fail grading)
- ADMN 410, Management Information Systems
- ECON 401 or 402
- ENGL 401

**Sophomore: Fall**

- ADMN 420, Business Statistics
- ADMN 502, Financial Accounting

**Sophomore: Spring**

Students typically declare an option during this semester.

- ADMN 503, Managerial Accounting
- One or two of the following courses
  - ADMN 601, Introduction to Financial Management
  - ADMN 611, Behavior in Organizations
  - ADMN 640, Quantitative Decision Making
  - ADMN 651, Marketing

**Junior: Fall**

Must declare an option by this semester.

Take the remaining 600-level courses from the Sophomore Spring list.

**Junior: Spring**

*Course(s) in option area

**Senior: Fall**

*Course(s) in option area

- ADMN 703, Strategic Management: Decision-Making (or take in Senior Spring term)

**Senior: Spring**

*Course(s) in option area

- ADMN 703, Strategic Management: Decision-Making (if not taken in Senior Fall term)

*Depending of the choice of option and the specific requirements thereof, students may be able to take WSBE or non-WSBE electives for some of these courses.

The **Option in Entrepreneurial Venture Creation (EVC)** is designed for students who intend to start a high growth business, work for a new venture or become involved in a new venture creation within an established organization. The EVC Option fosters an entrepreneurial culture throughout the program. The priority is real-world learning in the high growth environment of entrepreneurial ventures. The program includes active student participation, a seminar format, field trips to entrepreneurial ventures and guest speakers. Each student participates in a senior project and an internship at a high tech start-up.

**Required**

- MKTG 764, New Product Development or MKTG 763, Market and Opportunities Analysis
- DS 741, Private Equity/Venture Capital
- DS/MGT 742, Internship in Entrepreneurial and Management Practice
- MGT 732, Exploration in Entrepreneurial Management

The **Option in Finance** provides students with opportunities in a variety of disciplines including banking, insurance, corporate finance, investment management, and risk management. Finance majors are in excellent demand. The goal of the finance option is to expose the student to all three major branches of finance: investments, corporate, and financial institutions. At the same time, the option allows the student some flexibility in choosing courses. The option helps students planning to sit for the Chartered Financial Analyst (CFA) Level I exam, the Certified Financial Manager (CFM) exam, and the Certified Financial Planner (CFP) exam.
The **Option in Information Systems Management** provides students with both business problem-solving skills and in-depth technical knowledge. This unique combination of skills is in short supply, and the employment outlook is outstanding. The program concentrates on two areas: 1) organizations, with an emphasis on business processes, and 2) technology, with an emphasis on analysis, design, implementation, and management of an organization's information systems. Students take courses from the computer science department and WSBIE in completing the option, and a senior-level industry project is a core component of the program.

**Required**

Information Systems Development: Currently CS 405, Visual Basic I, or equivalent. The Faculty Coordinator of the option must approve any substitute course for CS 405.

DS 773, Database Management Systems

DS 774, Electronic Commerce Systems

DS 775, Information Systems Project

DS 780, Systems Analysis and Design; or

DS 798, Topics in Decision Sciences (specific topics may change from year to year)

The **Option in International Business and Economics** offers an interdisciplinary course of study, providing strong business training for students pursuing careers at organizations with an international focus, particularly in multinational corporations, international banks and government agencies. It achieves this by combining general business training with in-depth knowledge in economics, finance, and management. Students are strongly encouraged to round out their education with either an internship at an international organization or by studying abroad for one semester.

**Required**

ECON 645, International Economics

Three (3) of the following

ACFI 703, International Financial Management

MKTG 755, International Management

MKTG 760, International Marketing

ECON 611, Intermediate Macroeconomics

ECON 746, International Finance

One of the following

One of the remaining courses from list above.

4-credit graded Internship at an International Organization 1-semester Study Abroad Experience, that involves at least one approved international business or economics course and that results in at least 12 academic credits being transferred back to UNH.

ACFI 704, Derivative Securities and Markets

ECON 668, Economic Development

ECON 692, International Economic Integration

ECON 745, International Trade

ECON 747, Multinational Enterprises

The **Management Option** provides students with opportunities to develop a substantial foundation in the principles of managing the human, organizational, technical, and financial resources of organizations to enhance strategic competitiveness. Courses emphasize problem-solving, planning, and interpersonal skills related to ethical leadership in the new economy, managing innovation and change, and international and cross-cultural issues in organizations. The option emphasizes the generalist's mindset in concert with a specialist's functional understanding of the firm. Future career paths include an array of management, supervisory, sales, and other positions in established and entrepreneurial businesses. The option is also recommended for students considering graduate education in management or law.

**Required**

MGT 614, Organizational Leadership and Structure

MGT 701, Business, Government, and Society

In addition, two 600- or 700-level MGT courses. Current offerings include, which may change from year to year

MGT 647, Business Law I (or MGT 648 Business Law II; MGT option students can count at most one Business Law course toward the MGT option)

MGT 713, Leadership Assessment and Development

MGT 732, Exploration in Entrepreneurial Management

MGT 755, International Management

MGT 798, Applied Management Seminar (open only to MGT option students with GPA of at least 3.20)

MGT 798, Topics in Management (topics will change from year to year)

The **Option in Marketing** focuses on how to develop, establish, and maintain products and services of high value for customers as well as how to deliver and communicate them. The option addresses key linkages critical to effective customer and product management, from understanding customer needs and problems to delivering appropriate solutions and services. It further examines decision choices facing managers concerning market selection, entry timing, positional advantage to be pursued, targeting and executional approaches. Students can earn an option in marketing by successfully completing the requirements in the following table. Students are required to minimally take the following courses:

**Required**

MKTG 752, Marketing Research

MKTG 753, Consumer/Buyer Behavior

MKTG 762, Marketing Workshop

MKTG 763, Market Opportunity Analysis

At least two additional 700-level Marketing (MKTG) courses. Offerings will vary from semester to semester.

For additional courses, students are encouraged to meet with department faculty or with the Academic Advising Office for help in choosing a career track and additional courses.

A **Student-Designed Option in Business Administration** is available for those students whose interests are not fully satisfied by any of the other currently available options in Business Administration. Students desiring a self-designed option must submit the application to the faculty coordinator. After the faculty coordinator's approval, the proposal must receive approval from the academic director of undergraduate business programs and the Whittemore School Dean's Office.

Students applying for this option will normally be expected to have a grade point average of at least 3.0.

The student-designed option in business administration shall consist of at least five Whittemore School courses, at least three of which shall be from the business administration departments (currently accounting and finance, decision sciences, management, and marketing).

**Economics (ECON)**

wsbe.unh.edu/Dept_Economics/home.cfm

(For course descriptions, see page 170.)

**Chairperson:** Evangelos O. Simos

**Professors:** Karen Smith Conway, Bruce T. Elmslie, Richard W. England, Evangelos O. Simos, James R. Wible, Robert S. Woodward

**Associate Professors:** Michael D. Goldberg, Marc W. Herold, Ju-Chin Huang, Neil B. Niman, Torsten Schmidt

**Assistant Professors:** Reagan A. Baughman, Robert D. Mohr

Economics is the study of how societies organize themselves to produce goods and services and to distribute those products among the members of society. In the modern world, a combination of market forces, public policies, and social customs perform these basic economic tasks. Economists use concepts, models, and data to analyze efficiency of resource use, fairness of economic outcomes, and development of global and national economies. The economics program
is designed to introduce students to the tools of economic analysis and to show students how they can use those tools to analyze and better understand real-world situations.

Undergraduate training in economics is an excellent background for a variety of careers; these include banking and financial services, journalism, international business, public service, the diplomatic corps, entrepreneurial ventures, and government administration. An undergraduate major in economics is also excellent preparation for those interested in graduate work in law, business administration, and international relations.

Graduate work in economics can lead to careers in college teaching, research in public and private agencies, and business consulting. Those interested in studying economics at the graduate level should ask their economics professors what undergraduate coursework is appropriate and which graduate schools would be suitable.

Courses in economics are open to nonmajors on a space-available basis. Students majoring in other programs have found that certain economics courses are useful supplements to their own majors and a help in gaining employment. For example, political science majors can profit from studying public economics, economic development, and international economics. Mathematics and engineering students might elect to study econometrics and intermediate microeconomics. Environmental conservation majors could choose to study ecological or energy economics. For more information on economics electives, please consult the Whittemore School Undergraduate Programs Office (McConnell 120) or the chairperson of the economics department.

The department offers the choice of a B.A. degree or a B.S. degree in economics. The B.A. degree is designed to offer students maximum flexibility in designing a program of study. Students are encouraged to take a wide variety of courses, double major, and to take advantage of study abroad programs. The B.S. degree differs from the B.A. degree in that it requires more quantitative and data analysis courses but does not require a foreign language. It provides more structure and direction than the B.A. degree and is more professionally focused.

B.S. economics majors must complete nine courses in economics with a grade of at least C- (1.67) in each course and an average grade of 2.0 or better in the major courses. These courses must include ECON 605, 611, 726, and 775. In addition, majors must complete MATH 424A, ADMN 403, 410, 420, 502, and 503.

Major credit toward ECON 605 and/or 611 will be awarded to transfer students only if equivalent courses have been taken at the junior level or above. Transfer students must take at least five of their economics courses at UNH.

Students may petition to substitute one business administration course for an economics elective if the course is at the 600 level or above and if a grade of C- or better is earned. Students may earn no more than 16 credits in internships, independent studies, field experience, and supervised student teaching experience. All economics majors must satisfy the bachelor of arts or bachelor of science degree requirements.

The economics department offers three specialized options within the bachelor of art. By selecting economics electives from an approved list, a student majoring in economics can graduate with an option in financial and managerial economics, international and development economics, or public policy economics.

A suggested plan of study for B.A. economics majors follows

**Freshman Year**
- ECON 401, 402, Principles of Economics (Macro and Micro); MATH 420 or MATH 424A
- ADMN 403, Computing Essentials for Business
- ADMN 405, Freshman Academic Experience I (1 credit, credit/fail grading)
- ADMN 406, Freshman Academic Experience II (1 credit, credit/fail grading)

**Sophomore Year**
- ADMN 420, Business Statistics; ECON 605, Intermediate Microeconomic Analysis; ECON 611, Intermediate Macroeconomic Analysis

**Junior and Senior Years**
- Economics electives (at least 4)

A suggested plan of study for B.S. economics majors follows

**Freshman Year**
- ECON 401, 402, Principles of Economics (Macro and Micro);
  - MATH 420 or MATH 424A
- ADMN 403, Computer Essentials for Business; ADMN 405, Freshman Academic Experience I; ADMN 406, Freshman Academic Experience II; ADMN 410, Management Information Systems; ADMN 502, Introductory Financial Accounting

**Sophomore Year**
- ADMN 420, Business Statistics; ADMN 503, Managerial Accounting; ECON 605, Intermediate Microeconomic Analysis; ECON 611, Intermediate Macroeconomic Analysis

**Junior and Senior Years**
- ECON 726, Introduction to Econometrics; ECON 775, Applied Research Skills for Economists; Economics electives (at least 3)

A minor in economics consisting of five courses is also available. At least three of these courses must be taken at UNH. For more on the minor and options within the major, consult the Whittemore School Undergraduate Programs Office.

**Hospitality Management (HMGT)**

wsbe.unh.edu/Dept_HospMgmt/home.cfm

(For course descriptions, see page 195.)

**Chairperson:** Raymond J. Goodman, Jr.

**Professors:** Clayton W. Barrows, Raymond J. Goodman, Jr.

**Associate Professors:** Joseph F. Durocher, Jr., John C. Niser, Udo Schlentrich

**Affiliate Assistant Professor:** Sylvia H. Marple

The program in hospitality management is an integral part of the offerings of the Whittemore School. It is one of only a few programs worldwide that is accredited by both the Association to Advance Collegiate Schools of Business (AACSB) and the Accreditation Commission for Programs in Hospitality Administration (ACPHA). Graduates are prepared to assume management trainee and management positions in all sectors of the service sector, with primary emphasis on the hospitality industry.

Graduates have accepted positions in the lodging and food service sectors (and their allied businesses and wholesalers), software companies, tourism, travel and recreation industries, and in retirement facilities, hospitals, and college and university food service operations.

In order to have a well-rounded university education, students take courses in liberal arts as well as foundation courses in business administration and economics. The hospitality management curriculum builds upon this foundation and provides experience and in-depth education in the lodging and food service-related industries, as well as the broader industries that comprise the hospitality discipline.
With our on-campus learning laboratory, the New England Center Hotel and Conference Center, the program includes a mix of practical experiences along with classroom activities. These practical experiences are provided by major consulting projects to industry as part of classroom activities, lecture series, seminars, and field trips; a minimum of 800 hours approved work experience or practicum; and by involvement in the food service and lodging operations with University hospitality (the New England Center and campus dining and catering).

The Department of Hospitality Management offers seventeen required courses and three hospitality electives in groupings. Freshman and sophomore courses consist of eight core courses. Some sophomore, junior-level, and senior-level courses include most of the functional hospitality and business disciplines required to develop into a successful manager. A wide range of elective courses, independent studies, and internships can complement the required curriculum. In addition, the program requires completion of one semester of a 400-level math course.

To graduate, students must obtain a 2.30 grade-point average in all major required courses and a minimum grade of C- in each major course. Graduates of this program who are qualified for, and interested in further allied studies, are well prepared for advanced degree programs in hospitality, tourism, business, law, institutional, or health administration. Students may earn up to six total credits in internships, independent studies, field experience, and supervised student teaching experiences.

A required plan of study is as follows

**Freshman Year**

- HMGT 401, The Hospitality Industry: An Historical Perspective and Distinguished Lecture Series
- HMGT 403, Introduction to Food and Beverage Management
- ADMN 405, Freshman Academic Experience I (1 credit, credit/fail grading)
- ADMN 406, Freshman Academic Experience II (1 credit, credit/fail grading)
- HMGT 567, Food and Beverage Operations Management
- ADMN 502, Introductory Financial Accounting
- ECON 401, Principles of Economics (Macro) and ECON 402, Principles of Economics (Micro)
- University general education courses

**Sophomore Year**

- HMGT 554, Lodging Operations Management
- HMGT 620, Business Statistics
- HMGT 618, Uniform Systems for the Hospitality Industry
- Four University general education courses

**Junior Year**

- HMGT 600, Hospitality Marketing Management
- HMGT 667, Advanced Food & Beverage Management
- HMGT 625, Hospitality and Employment Law
- HMGT 635, Hospitality Human Resource Management
- ADMN 611, Behavior in Organizations
- Hospitality Management Elective
- 2 general education courses

**Senior Year**

- HMGT 655, Hospitality Finance and Development
- HMGT 703, Strategic Management in the Hospitality Industry
- Hospitality Management Electives
- 4 free electives

*Three elective courses in Hospitality Management (or two electives and an internship, teacher assistant, or independent study analysis) are required for graduation.

A minor in hospitality management comprises five courses. The four listed below are required.

- HMGT 401, Hospitality Industry: Historical Perspectives and Distinguished Lecture Series
- HMGT 554, Lodging Operations Management
- HMGT 567, Food and Beverage Operations Management
- ADMN 502, Introductory Financial Accounting
- Choose one of the following:
  - HMGT 661, Meeting Planning Management
  - HMGT 681, Resort Management
  - HMGT 771, Beverage Management/International Wines
  - HMGT 777, Casino Management
  - HMGT 772, Senior Living Industries Management
  - HMGT 750, Senior Operations Seminar

**International Affairs (dual major)**

(For program description, see page 111.)

**Departments**

**Accounting and Finance (ACFI)**

[wsbe.unh.edu/Dept_AcctFinance/home.cfm]

(For course descriptions, see page 145.)

**Chairperson:** Ahmad Etebari

**Professors:** Ahmad Etebari, Fred R. Kaen

**Associate Professors:** Stephen J. Ciccone, Ashfadh J. Irani, Catherine A. Plante

**Assistant Professors:** Brian John Bolton, William C. Johnson, Stefanie Tate, Le Xu

**Lecturer:** Edwin Nelson

**Adjunct Faculty:** William F. Knowles

Accounting and finance provide the basic language of businesses and the underlying structure for information systems. Finance provides important knowledge about asset management, capital markets, and risk strategies. This department coordinates the options in accounting and finance and is responsible for the Master of Science in Accounting.

**Decision Sciences (DS)**

[wsbe.unh.edu/Dept_DecSciences/home.cfm]

(For course descriptions, see page 168.)

**Chairperson:** A. R. Venkatchalam

**Professors:** Barry Shore, Jeffrey E. Sohl, A. R. Venkatchalam

**Associate Professors:** Roger B. Grinde, R. Daniel Reid, Christine M. Shea, Eleanne M. Solorzano, Craig H. Wood

**Assistant Professors:** Kholekile L. Gwebu, Honggeng Zhou

**Instructor:** Peter W. Royce

**Lecturer:** Matthew J. Macarty

Data-driven decision expertise is critical for the survival and growth of modern enterprises. The Decision Sciences Department brings together faculty with special expertise in decision support systems, enterprise information systems, enterprise integration, management science, business statistics, operations/technology management, research, and manufacturing strategy. This department coordinates the options in information systems management and entrepreneurial venture creation.

**Management (MGT)**

[wsbe.unh.edu/Dept_Management/home.cfm]

(For course descriptions, see page 205.)

**Chairperson:** Michael J. Merenda

**Professors:** Ross J. Gittell, Allen M. Kaufman, Michael J. Merenda

**Associate Professors:** Carole K. Barnett, Vanessa Urch Druskat, Peter J. Lane, William Naumes, Richard Saavedra

**Assistant Professors:** Jun Li, Anthony T. Pescosolido

**Affiliate Assistant Professor:** Margaret Naumes

**Adjunct Faculty:** Timothy Churchard, Karen Fisher, William Frago, Robert Gough, Thomas Hand, William Hassey, Eric Herr, Peter Hughes, Peter Masucci, Meera Venkatachalam

The study of management focuses on how organizations develop, craft, and implement winning strategies, structures, systems, and values in global markets. Courses emphasize the organization’s stakeholders and the accompanying social, political, legal, economic, and technical dynamics of worldwide markets. The department’s goal is the develop-
opment of effective, socially responsible, and ethical leaders through innovative teaching, research, and service. Courses cover such topics as leadership, decision-making, ethics, innovation, organizational learning, entrepreneurship, knowledge and human resource management, governmental policy making, and global competitiveness. The department's approach to teaching involves educational methods that promote exper­
imental learning, self-awareness, theoretical mastery, and case studies and managing oneself. A major emphasis is on action learning through group projects, business plan preparation, and the case method.

Marketing (MKTG)

wsbe.unh.edu/Dept_Marketing/home.cfm

(For course descriptions, see page 206.)

Chairperson: Michael J. Merenda
Professor: Charles W. Gross
Assistant Professors: Ludwig A. Bstieler, Jeong Eun Park
Instructor: Mary S. Wagner
Lecturer: William C. Machanic
Adjunct Faculty: Peter F. Masucci

The marketing department is dedicated to preparing students for 21st century marketing careers by:

• offering students a strong marketing foundation and a career track that will make them attractive to employers upon graduation and provide the basis for life long marketing learning;
• interacting with students in ways that encourage individual curiosity, interest, and expression;
• engaging in leading-edge scholarly research and integrating that research into the marketing curriculum.

Concentrating in marketing provides students with a wide array of career paths, including advertising, sales, retailing, market analysis, public relations, marketing research, product or brand management, sales forecasting, competitive analysis, strategic marketing planning, media planning, and several others. Accordingly, the department offers tracks beyond the set of core courses required of all marketing students to help students prepare for such careers. The department coordinates the option and tracks.
University-Wide Programs

Hamel Center for Undergraduate Research (UROP/IROP/SURF/Inquiry)

In keeping with this research university’s mission to create and disseminate knowledge, UNH’s Hamel Center for Undergraduate Research offers undergraduates—working in concert with UNH faculty mentors—both funding and administrative support for individually designed academic projects ranging from laboratory research to humanist scholarship and fine and performing arts creations. Once completed, projects and their student authors may receive further support from Undergraduate Research for presentations at national and international conferences and for on-line publication in the undergraduate research journal, Inquiry.

Initially known as UROP (Undergraduate Research Opportunities Program), the Hamel Center for Undergraduate Research currently offers year-round academic opportunities both in the U.S. and abroad via competitive grant applications. Undergraduate Research Awards (URA) are available each semester (research time commitment is flexible); Summer Undergraduate Research Fellowships (SURF) awards for the U.S. and abroad offer support between academic years. By registering for INCO 590, students can work directly with faculty members while receiving academic credit and support for research expenses. The International Research Opportunities Program (IROP), a research summer abroad under the direction of both a UNH mentor and a colleague at the research location, offers nearly unlimited possibilities for exploration of any topic anywhere in the world (recent destinations: Mongolia, Thailand, Namibia, Germany, Australia; recent topics: moose habitats, neo-natal care in China, Bangkok police department organization, impressionist strategies for open-air painting).

Grants from the Hamel Center for Undergraduate Research open doors on real-world disciplinary practice, graduate schools, post-baccalaureate fellowships, and careers; Undergraduate research develops first-hand knowledge of the world and one’s place in it. For information about all awards, programs, and Inquiry, contact the Hamel Center for Undergraduate Research in 209 Hood House, (603) 862-4323, or visit the Web site at www.unh.edu/undergrad-research.

Honors Program

The University of New Hampshire has a tradition of encouraging academic achievement through its 21 honorary societies, including active chapters of Phi Beta Kappa and Phi Kappa Phi. In 1984, the University took another step toward the recognition of outstanding students by establishing an undergraduate honors program. The University Honors Committee, made up of representatives from all colleges of the University, the Office of Admissions, the Division of Student and Academic Services, and the Registrar’s Office, supervises the operation and requirements of the program.

There are two ways to enter the University Honors Program:

1. The Office of Admissions identifies a number of qualified incoming freshmen to be admitted to the honors program.
2. Freshmen who demonstrate academic excellence are also invited to join the program.

Participation in the University Honors Program does not add courses to those required to graduate. The first two years of the program focus on general education requirements. Students take a minimum of four honors-designated general education courses, one of which is an honors seminar based on a special topic. All students must attain a cumulative grade-point average of 3.20 by the end of their sophomore year in order to continue in the honors program.

The upper class part of the honors program consists of honors work in the majors. Information describing these programs is available in department and college advising offices, in the Honors Program Office, and on-line at www.unh.edu/honors-program/requirements. Programs with “honors in major” work are animal sciences, anthropology, arts, biochemistry, biology, business administration, chemistry, chemical engineering, civil engineering, classics, communication, communication disorders,
computer science, earth sciences, economics, English, electrical and computer engineering, environmental conservation, environmental horticulture, environmental and resource economics, family studies, forestry, French, geography, German, health management and policy, recreation management and policy, history, hospitality management, humanities, kinesiology (exercise specialist option), linguistics, mathematics, mechanical engineering, medical laboratory science, microbiology, music, nursing, nutritional sciences, occupational therapy, outdoor education, philosophy, physics, plant biology, political science, psychology, Russian, social work, sociology, Spanish, theatre, wildlife management, women's studies, and zoology. Successful completion of University Honors Program requirements entitles the student to receive the designation "University honors in major" on his or her academic record and diploma. Completion of "honors in major" only is similarly denoted.

To satisfy honors program requirements, students must have a final cumulative grade-point average of 3.20 and meet the grade-point average requirements of their honors-in-major program. All courses used to achieve an honors designation must have a minimum grade of B-, and may not be taken pass/fail. Full-tuition and partial-tuition merit-based scholarships are available to a select number of incoming freshmen. Several partial-tuition scholarships are also awarded to upper-class students. For more information, please contact Lisa MacFarlane, director, University Honors Program, Hood House.

**Fellowships Office**

The UNH Fellowships Office provides information, counsel, and editorial support to high achieving students applying for national and international fellowships and scholarships. The office also assists faculty members who serve as mentors and recommends and arranges for members of the faculty to take part in interviews and screening committees.

Established in 2005, the Fellowships Office is situated in the University Honors Program. In recruiting, advising, and supporting students with exceptionally strong records of academic excellence, the office staff collaborates campus-wide with other offices and departments of the university, including the Center for International Education and the Hamel Center for Undergraduate Research, in support of the University’s Academic Plan.

The services of the Fellowships Office are available to undergraduates, graduate students, and alumni of the University. The Fellowships Office staff holds membership in the National Association of Fellowships Advisors. For more information, please contact Dr. Robert E. Stiefel, Coordinator and Advisor, The Fellowships Office, Hood House 220. Telephone: (603) 862-0733. E-mail: Robert.Stiefel@unh.edu.

**Interdisciplinary Programs**

**Computer and Information Technology Minor**

The computer and Information Technology (CIT) minor is a way for students from a variety of non-technical fields to bridge the gap between a primarily non-technical education and a technical world. Graduates from varying fields are discovering that there is a great need to have computer competency in addition to the knowledge they gain in their major; and, the CIT minor, which is tailored to grow students’ understanding of computer and information technology applications, helps prepare students for the future.

The student who minors in CIT must complete a minimum of 20 credits of CIT courses. All students must take CS 402, Survey of Computer Science, as well as a programming course. The other three courses can be chosen from the following options list.

Credit toward the minor will only be given for courses passed with C- or better, and a 2.00 grade-point average must be attained in courses for the minor. Courses taken on the pass/fail basis may not be used for the minor. Students should declare their intent to earn a minor as early as possible and no later than the end of the junior year. During the final term, an application must be made to the student’s dean to have the minor shown on the academic record. Students must consult with their major adviser and also the minor supervisor.

**Requirements**

1. CS 402, Survey of Computer Science
2. A programming course chosen from the following: CS 405, Introduction to Applications Programming with Visual Basic
   CS 410, Introduction to Scientific Programming
   CS 503, Introduction to Web Programming

**Options (At least two of the Options courses must be 500-level)**

- CS 401, Computer Applications
- CS 403, Online Network Exploration
- CS 502, Intermediate Web Design
- CS 504, Intermediate Web Programming
- CS 505, Database Programming
- CS 506, Intermediate Applications Programming with Visual Basic
- CS 509, Network/System Administration

Students who wish to minor in computer and information technology should consult Israel Yost, Department of Computer Science, 214 Parsons Hall, (603) 862-2245 or e-mail Israel.Yost@unh.edu.

**Earth, Oceans, and Space**


**Research Professors:** David S. Bartlett, Janet W. Campbell, Terry Forbes, Christopher W. Glass, Philip A. Isenberg, Changsheng Li, R. Bruce McKibben, Charles W. Smith III, Robert W. Talbot, Charles J. Vörösmarty

**Associate Professors:** Benjamin D.G. Chandran, James Connell, George C. Hurtt, Lynn M. Kistler, Mark L. McConnell, Joachim Raeder


**Assistant Professors:** Robert J. Griffin, Scott V. Ollinger, James M. Pringle

**Research Assistant Professors:** Bobby H. Braswell, John C. Dorelli, Yuri E. Litvinenko, Huiting Mao, Mary E. Martin, John R. Morrison, Chung-Sang Ng, Barkley C. Sive, Ruth K. Varney

The Institute for the Study of Earth, Oceans, and Space (EOS) is UNH’s largest research organization and its first University Institute. It brings together under common themes a number of well-established research programs. Research activities are focused in EOS four centers: the Climate Change Research Center, the Complex Systems Research Center, the Ocean Process Analysis Laboratory, and the Space Science Center.

EOS scientists are exploring processes on the Sun, solar influences on Earth and its magnetosphere, the chemistry and dynam-
ics of the atmosphere, changing climate, and large-scale ecosystems in terrestrial and marine environments, emphasizing complex impacts on and by human activities. Research takes EOS investigators from the most distant energetic phenomena in the universe to the Earth's environment in space; to tropical, temperate, and boreal forests; from the coast of New Hampshire, to the Gulf of Maine, and the deepest regions of the ocean; from the grasslands and agricultural fields of China to those of the American Midwest; from the great ice sheets and marine environments, emphasizing large-scale ecosystems in terrestrial habitats. Research takes EOS investigators from the universe to the Earth's environment in most important and inaccessible places in the universe, in our solar system, and on our planet.

The primary educational theme of the Institute is the training and mentoring of graduate students through participation in advanced research funded by major national and international organizations; for example, the National Aeronautics and Space Administration, the National Science Foundation, and the National Oceanic and Atmospheric Administration. However, EOS faculty teach and mentor undergraduate students as well, and there are numerous opportunities for undergraduates to participate in the research activities of the Institute. Undergraduates interested in EOS activities should contact either EOS faculty in their academic departments, or e-mail the EOS director's office, eos.director@unh.edu.

**Gerontology**

*(For course descriptions, see page 188.)*

The gerontology interdisciplinary minor provides students with the opportunity to examine and evaluate the aging process as it affects the individual and society. Through in-depth inquiry, personal encounters, and classroom discussion, students develop an understanding of aging from a variety of perspectives. Students are encouraged to analyze the historical and philosophical foundations from which policies, programs, and professional activities affecting the aged are developed, implemented, and evaluated.

Gerontology minors are required to take a minimum of 20 credits (five courses) from the following list of courses approved by the Gerontology Interdisciplinary Minor Advisory Committee.

- GERO 600, Introduction to Gerontology
- GERO 795, Independent Study (a practicum arranged by the coordinator of the minor, or by the appropriate designee)
- FS 525, Human Development
- HMP 755, Aging and Long-Term Care Policy
- KIN 607, Biology of Aging
- NURS 535, Death and Dying
- NUTR 760, Geriatric Nutrition
- OT 501, Developmental Tasks of Adulthood
- PSYC 582, Adult Development and Aging
- PSYC 741, Cognitive Aging
- SW 525, Introduction to Social Welfare Policy
- SW 530, Human Behavior and Social Environment
- SW 700, Social Gerontology
- SW 701, Women and Aging
- SOC 720, Current Developments in the Family: Aging and Late-Life Family

Students who wish to minor in gerontology should consult the School of Health and Human Services Dean's Office.

**Intercollege Courses**

*(For course descriptions, see page 197.)*

Courses appearing in previous editions of this catalog under the caption INCO 404 Honors: Introductory Seminar are offered this year with subject codes and the course number 444H. For more information, see University Academic Requirements, page 16. INCO 404 is reserved as a course designation for possible use in future years.

**International Affairs**

*(For course descriptions, see page 198.)*

The Center for International Education offers undergraduate students the opportunity to pursue a dual major in international affairs. The dual major requires completion of the interdisciplinary international affairs program and any other major.

The purpose of the program is to expand students' global horizons, enhance their disciplinary major, and expand their career opportunities into the international arena.

*The Department of Civil Engineering has worked with the UNH Center for International Education to develop a dual-major program in civil engineering and international affairs. Civil engineering students participating in this program must spend at least one semester abroad in that language. Students can complete this program in five years or less and do not need to have existing skills in a foreign language to participate. For more information, contact Ray Cook at (603) 862-1411 or by e-mail to ray.cook@unh.edu.

**Required Core Courses**

- IA 401, International Perspectives: Science, Business, and Politics
- IA 501, Global Issues in International Affairs
- IA 701, Seminar in International Affairs

**Four Electives**

Choose one from each of the program's four electives:
- Foreign Area (to be taken prior to foreign experience)
- Science, technology, and the private sector
- Public policy
- Theory in international affairs

**Competency in Geography**

Satisfactory score on geography exam, administered once a semester

**Competency in a Foreign Language**

Functional reading, writing, and speaking ability equivalent to the third-year, second-semester level

**Foreign Experience**

Minimum of eight weeks in a non-English speaking country

The courses in the dual major program are multidisciplinary, taught by faculty from many different departments in the University. They are designed to help students appreciate the complex interrelationships and interdependencies among nations and peoples and to equip students with the analytical skills and broad perspectives necessary for both public- and private-sector international careers.

Students who wish to declare international affairs must earn a C or better in IA 401, have declared (or be prepared to declare) a disciplinary major, and have a 2.50 cumulative grade-point average. After declaration, students are expected to maintain at least a 2.50 grade-point average, which is the minimum required for study abroad at UNH.

IA 401, a prerequisite for IA 501, should be taken no later than spring of the sophomore year. IA 501 should be taken prior to foreign experience. The geography exam is offered every semester. Students may take the exam three times, but must pass it before taking IA 701.

The foreign experience (usually completed during the junior year), the geography exam, and the foreign language requirement are completed before taking IA 701 in the senior year. To acquire the knowledge, skills, and experience that come from residence in a foreign culture, students may spend an academic year, semester, or summer in an academic institution, in an internship with a private or public organization, or in purposeful travel/research. All foreign experiences must be pre-approved by the IA major adviser or the University Committee on International Studies.
The completion of the dual major requires no additional credits for graduation beyond the 128 required of all UNH students. All coursework required for international affairs must be completed with a grade of C or better. For information, contact the Center for International Education, Hood House, (603) 862-2398, www.unh.edu/cie.

Marine Sciences

Undergraduate programs in marine science and ocean engineering at the University of New Hampshire reflect the diversity of the ocean itself and are enriched by easy access to a variety of natural laboratories, including tidal rivers, estuaries, coastal areas, and the open ocean.

Studies in marine science and ocean engineering are offered through various departments of the University. Students identify the discipline (ranging from zoology through earth sciences to mechanical engineering) they like best and pursue marine specializations related to that area of study. Studies can take place in research laboratories on campus as well as at various field stations or aboard UNH research vessels.

Marine Program

The Marine Program provides a campus-wide umbrella for marine activities and maintains specialized facilities to support efforts of faculty in individual departments and organized research units. Academic programs are focused broadly on marine biology, ocean engineering, and ocean science, and the Marine Program supports experiential learning opportunities beyond the formal classroom through three centers: the Center for Marine Biology, the Center for Ocean Engineering, and the Center for Ocean Sciences.

Estuarine research is pursued at the Jackson Estuarine Laboratory on Great Bay, which is designated a National Estuarine Research Reserve. The Coastal Marine Laboratory, a major running-seawater facility, is located in nearby Newcastle. Research on salmonids and other freshwater animals is conducted at the Anadromous Fish and Aquatic Invertebrate Research Laboratory, located near the Durham reservoir. The Institute for the Study of Earth, Oceans, and Space is a major center for ocean sciences research. The on-campus Chase Ocean Engineering Laboratory houses both educational and research activities. Off-shore and coastal studies are carried out aboard the University's 50-foot research vessel, the Gulf Challenger, which has docking facilities at the Jackson Lab and at the State Fish Pier in Portsmouth Harbor. During the summer, students may live and study at the Shoals Marine Laboratory on Appledore Island, one of the Isles of Shoals. There UNH and Cornell University cooperatively offer undergraduate courses in marine sciences in a summer field laboratory setting. Each of the marine program facilities features modern specialized equipment and opportunities for undergraduate students to work and carry out independent research.

Curricula in the Marine Sciences

There are currently two undergraduate majors and four minors in the marine sciences. The College of Life Sciences and Agriculture offers a B.S. in biology with an option in marine and freshwater biology (see biology under COLSA) and the Department of Earth Sciences offers an option in oceanography as part of its B.A. earth sciences program (see page 60). In addition to these offerings, students can declare a major in any established discipline and augment it with a minor in marine biology, ocean engineering, oceanography, or wetland ecology.

Students are encouraged to declare their intention to follow these programs as soon as possible.

Marine Biology Minor

The minor is designed to provide a foundation in marine biology and related sciences to any UNH undergraduate student with the exception of students enrolled in the MFB option of the Biology Program. It is offered through the Zoology Department. The minor consists of 20 credits with grades of C- or better and no pass/fail courses. No more than 8 major requirement credits may be used towards the minor. All courses in the program are selected in consultation with the minor adviser. Contact Dr. Larry Harris, (603) 862-3897, Department of Zoology, for more information.

Students who want to minor in marine biology must take one introductory course (ESCI 501, Introduction to Oceanography; ZOOL/PBIO 503, Introduction to Marine Biology; or ZOOL 674, Field Marine Science) and four courses concentrating on an area of interest. For example, a student interested in marine mammals might take Mammalogy (ZOOL 712), Marine Invertebrate Evolution and Ecology (ZOOL 628), Marine Vertebrates (ZOOL 753), and Fisheries Biology (ZOOL 772). Courses commonly taken as part of the minor include BCHM 702; EREC 611; NR 610; PBIO 625, 721, 722, 725, 727; ENE 747; MICR 707, 714; ZOOL/PBIO 503 and ZOOL 610, 611, 628, 674, 710, 711, 730, 750, 751, 753, 772, 773, 795. In addition, students are encouraged to become involved in a research project, either by working in a professor's laboratory or by participating in the Undergraduate Ocean Research Program (TECH 797).

Students should declare their intention to minor in marine biology before the end of the junior year. During the final term, students should apply to the dean to have the minor shown on their transcript.

Ocean Engineering Minor

The ocean engineering minor allows undergraduate engineering students to acquire a nucleus of knowledge about engineering pertaining to the ocean and the coastal zone.

To meet the University minor requirement, students must satisfactorily complete a minimum of five courses from the following list: ESCI 501, Introduction to Oceanography; OE 690, Introduction to Ocean Engineering; ESCI 752, Chemical Oceanography; ESCI 758, Introductory Physical Oceanography; ESCI 759, Geologic Oceanography; OE 710, Ocean Measurements Lab; OE 745, Environmental Acoustics I; OE 753, Ocean Hydrodynamics; OE 754, Ocean Waves and Tides; OE 756, Principles of Naval Architecture and Model Testing; OE 770, Fundamentals of Ocean Mapping; OE 771, Geodesy and Positioning for Ocean Mapping; OE 781, OE 785, Environmental Acoustics II; OE 795, Special Topics in Ocean Engineering; ENE 747, Introduction to Marine Pollution and Control; OE 757, Coastal Engineering and Processes; and TECH 797, Undergraduate Ocean Research Program. Ordinarily, students typically take ESCI 501, TECH 797, and OE 690 plus two additional engineering courses from the above list to complete the minor.

Students wishing to take the ocean engineering minor should indicate their interest to the ocean engineering minor adviser, Dr. Kenneth C. Baldwin, (603) 862-1898, Chase Ocean Engineering Laboratory, no later than the beginning of the junior year. During the final semester, students must apply to the dean to have the minor shown on their transcript.
Oceanography Minor

The minor in oceanography is available to all students in the University interested in obtaining a broad background in oceanography and is offered through the Department of Earth Sciences. The minor consists of a minimum of five courses with grades of C (2.00) or better and no pass/fail courses. No more than 8 major requirement credits may be used. All courses in the program are selected in consultation with the oceanography minor adviser, James Pringle, (603) 862-5000, Department of Earth Sciences.

Required courses include 1) ESCI 501, Introduction to Oceanography; 2) two of the following courses: ESCI 750, Biological Oceanography; ESCI 752, Chemical Oceanography; ESCI 758, Introductory Physical Oceanography; ESCI 759, Geological Oceanography; 3) any two of the following courses, or a suitable substitute approved by the minor adviser (at least one of these courses should be in the biological sciences): PBIT 625, 722; CIE 757; ENB 747, 753; ESCI 653, 658, 754, 756, 760, 770, 771; MICR 707; OE 690, 710, 753, 754, 757, 785; EREC 611; TECH 797; ZOOL 503, 560, 674, 720, 725, 730, 751, 772, 775; ZOOL/ESCI/750.

Students are encouraged to declare their intention to minor in oceanography before the end of the junior year. During the final semester, students should apply to the dean to have the minor shown on their transcript.

Shoals Marine Laboratory

The University of New Hampshire, in cooperation with Cornell University, offers a summer field program in marine sciences on Appledore Island of the Isles of Shoals. Undergraduate courses introduce students to a broad array of marine sciences, including oceanography, marine biology, fisheries, and marine resources. Introduction to Marine Science (ZOOL 474), a three-week, 4-credit course, is offered every other summer at the Shoals Marine Laboratory (SML). It has no prerequisites and satisfies the general education requirement in the biological sciences. The four-week, 8-credit general courses, Field Marine Science (ZOOL 674) and Field Marine Biology and Ecology (ZOOL 675), are offered in June and mid-July, respectively, each summer. They draw upon the backgrounds of numerous faculty and others associated with marine science and fisheries. There are daily lectures and work in laboratory and field. The courses are graded on a letter-grade basis; at least one full year of college biology or the equivalent is a prerequisite. All SML courses may be taken for Honors credit by UNH students with a minimum 3.2 grade-point average.

Other credit courses are offered in marine botany, invertebrate zoology, experimental ecology, ornithology, animal behavior, fish ecology, coastal ecology and bioclimatology, wetlands, marine vertebrates, coastal policy, underwater research, and biological illustration.

Undergraduate research for credit is an option where students carry out part or all of an independent project at Shoals under the guidance of Shoals faculty. Shoals offers generous financial aid to UNH students outside of the normal UNH financial aid packages. For further information, contact Dr. Jessica Bolker at (603) 862-0071, or e-mail jbolker@cisunix.unh.edu, Department of Zoology, and consult the Web site at www.sml.cornell.edu.

Diving Program

UNH has maintained an active research diving program for the past 36 years to provide assistance for faculty, staff, and students with both instruction and support for research diving, allowing many certified student divers to participate in University-sponsored underwater research projects. Today the UNH Dive Program consists of two areas: the academic portion where students, faculty, and staff may enroll in courses for academic credit (through the Department of Kinesiology), and the research portion, which supports faculty and student divers in University-sponsored underwater projects.

For further information about the UNH Diving Program as well as the offered workshops in rescue diving and diving accident management, contact Liz Kintzing, (ek@cisunix.unh.edu), diving program officer, through the Diving Program Office at (603) 862-3896.

Marine Research

There are many opportunities for undergraduates to participate in marine research under the supervision of UNH faculty. The University has a Sea Grant College Program that supports research, teaching, and service projects through numerous partnerships with the National Oceanic and Atmospheric Administration. Marine research projects are also supported through the National Science Foundation, the Environmental Protection Agency, the Office of Naval Research, and other state and federal agencies, foundations and private donors.

Extensive research, interdisciplinary academic programs, and the extraordinary variety of marine environments and facilities allow students to observe and learn about the frontiers of science and technology being explored in the ocean. For further information about marine opportunities, contact the Marine Program Office in the Jere A. Chase Ocean Engineering Laboratory or through the Marine Program Web site at marine.unh.edu.

Race, Culture, and Power

How does the category of race shape our lives, our politics, and our possibilities? Events in this country and internationally constantly remind us that race is an explosive issue. To be able to function as citizens of the world, one must understand the dynamics of race, culture, and power.

This minor reflects intellectual currents now being felt around the world. It prepares students to live in the twenty-first century.

Courses for the minor enable students to develop critical perspectives on the ways in which cultural differentiation and racial explanations have been used to maintain social, economic, and political power and justify inequalities and injustices.

To complete the minor, students are required to take one of the following three courses: INCO 450, an introductory course, ANTH 760: Race in Global Perspectives, or EDUC 797/897: Teaching Race, in addition to 16 credits of electives. Students must earn a C- or better in each course, and must maintain a 2.00 grade-point average in courses taken for the minor.

Elective Courses

Electives are approved for the minor and announced each semester in the Time and Room Schedule. Ordinarily, not more than two electives may be taken from the same academic department. A relevant internship may be substituted for one of the electives. Many electives are special topics and require student petition. Students should consult the minor coordinator before registration.

For further information please contact the coordinators, Nina Glick Schiller, Department of Anthropology, (603) 862-1848; ninaglickshiller@unh.edu or Justus Ogembo, Department of Anthropology, (603) 862-2401; jogembo@unh.edu or Mimi Winder, Administrative Assistant, Race, Culture, and Power office, 329 Huddleston, (603) 862-3753; rcp.minor@unh.edu.

SPECIAL UNIVERSITY PROGRAMS
Student-Designed Majors

Under special circumstances, students may design their own majors. This option is offered for highly motivated and self-disciplined students who seek a course of study that is not available through existing programs at the University. It allows students, with the close supervision of faculty members, to cross department and college lines and to create educational experiences on and off campus as part of individual programs of study.

Student-designed majors are administered by a committee of elected faculty that operates through the Office of the Provost and Executive Vice President. Students who want to design their own majors are expected to give the committee evidence of careful thought and planning in a proposal submitted on or before October 15 during the student’s junior year. The committee will convene soon after October 15 to review the proposals.

Submissions after this deadline are strongly discouraged, but if an application is late for reasons beyond the student’s control, the SDM Committee may review the application on a case-by-case basis.

Proposal guidelines are available in the Office of the Provost and Executive Vice President and on the Academic Affairs Web site, www.unh.edu/academic-affairs. Click on “Undergraduate Students.”

War and Peace Studies

War is the scourge of humankind. Tribes, cities, and nations have gone to war against each other for as long as we have records; only here and there, among some small “precivilized” groups, has war been absent or strictly controlled. For as long as we have records, too, we find thoughtful people crying out against war and pleading for peace, arguing for principles to govern war’s conduct and laboring to mitigate war’s effects, imagining a world where war is abolished, and taking steps to bring that world about. As the scale of war has grown to a size now great enough to devastate the entire globe in a single conflict, more and more people have devoted themselves to preventing war and finding acceptable substitutes. In the nuclear era, age-old moral and religious discussion has joined with historical study and practical, even technical, research to produce a set of related disciplines sometimes called “war and peace studies.”

To meet the requirements for the war and peace studies minor, students must complete two core courses (8 credits) and 12 credits of elective courses with a grade of C- or better. Ordinarily no two electives (or no more than 4 credits) may be taken from the same academic department. No elective may count for both a student’s major and the war and peace minor. A relevant internship may be substituted for one of the electives. As they are announced, other relevant courses may be added to the list of acceptable electives. Students may request others not so listed. Courses carrying fewer than four credits will be counted as partial satisfaction of an elective requirement. If a good case can be made for it, a departure from any of these rules may be approved by the adviser for the minor and the coordinator.

All students will be assigned an adviser from the membership of the Committee on War and Peace Studies, ordinarily one not in the student’s major department. The adviser will assist students in constructing a coherent program that suits their particular interests.

The core courses are INCO 401, War, and INCO 402, Peace. Occasionally a new core course may be included.

Departmental elective courses will include courses such as these:
- AERO 681, National Security Forces in Contemporary American Society (3 cr.)
- CMN 456, Propaganda and Persuasion
- HIST 617, Vietnam War
- HIST 537, Espionage and History
- NR 435, Contemporary Conservation Issues and Environmental Awareness
- POLT 562, Strategic and National Security Policy
- POLT 778, International Organization
- SOC 780, Social Conflict

Special offerings that may serve as electives:
- ANTH 797, Advanced Topics in Anthropology (e.g., War and Complex Society)
- ECON 696, Topics in Economics (e.g., Economics of War and Peace)
- ENGL 595, Literary Topics; ENGL 693, 694, Special Topics in Literature; ENGL 797, 798, Special Studies in Literature (e.g., Literature of World War I, Literature of the Vietnam War)
- HIST 600, Advanced Explorations (e.g., Comparative Revolutions)
- HUMA 730, Special Studies (e.g., Nonviolence, Thinking about War and Peace)
- INCO 404P, Honors: Introductory Seminar (e.g., Understanding War)
- POLT 660, Special Topics in International Politics (e.g., Arms Control and Disarmament)

For more information, contact either Ken Fuld, Department of Psychology, or Michael Ferber, Department of English.

Preprofessional Programs

Prelaw

Many graduates of UNH attend law school. The faculty and staff advisers of the Prelaw Advising Committee work closely with students to identify interests and explore opportunities within legal education. The committee helps students undertake the best possible preparation for legal education while also bringing the excitement of law to UNH students. The committee achieves this goal through careful consideration of the American Bar Association’s (ABA) statement on preparation for legal education (found on the Web at www.abanet.org/legaled/prelaw/prep.html).

In that statement, the ABA explains why no single major or course is required or recommended for students wishing to explore or prepare for legal study. The ABA does, however, describe certain skills and values that are essential to success in law school and to life as a lawyer. Those skills include analytic and problem solving skills; critical reading abilities; writing skills; oral communication and listening abilities; general research skills; task organization and management skills; and the values of serving others and promoting justice.

Prelaw advising implements the ABA statement by working with student interests and strengths to select UNH courses, internships, and experiences that will develop those skills and values. Programmatically, the committee provides a prelaw library, visits to local law schools, and sponsors discussions with law school admission and financial aid representatives, and with members of the legal community. The committee also provides support for LSAT preparation, law school search, writing personal statements, and the application and selection processes.

Interested students should register with the committee by contacting the University Advising and Career Center, Hood House, at (603) 862-2064. Additional information is available on the Web at www.unh.edu/prelaw-advising/.

Premedical/Prehealth Care Professional Study

The Pre-professional Health Programs Advising Office in Hood House provides advising for all students preparing for postgraduate careers in medicine, dentistry, optometry, chiropractics, podiatry, physical therapy, and physician assistant programs.
(for information on the pre-veterinary medicine option in animal sciences, see page 87). There is no premedical or predental major at UNH, so students are encouraged to major in the subject of most interest to them. A student’s major is not considered in the medical school application process and students from majors in all five UNH colleges have been admitted to postgraduate health professional programs. Though premedical/predental is not a major, interested students are expected to register with the Pre-professional Health Programs Advising Office in Hood House as soon as possible so as to be kept informed of important events, opportunities, and deadlines regarding preparation for application.

**A premedical/predental program at UNH consists of the following:**

1. **Taking the prerequisite courses for admission to a health professional program.** Medical and dental schools generally require biology, physics, general chemistry, and organic chemistry—all two semesters each with laboratory. A semester of biochemistry is also required. A year of English is required, as is one year of math including at least one semester of calculus. Prerequisite courses can be taken as part of a student’s major curriculum, as part of the general education requirements, or as electives.

2. **Gaining volunteer/health care experience.** Applicants to health professional programs will be expected to demonstrate a sustained involvement in volunteer and community service. A significant portion of this experience must take place in a health professional setting and include direct patient contact. Most students gain this experience by volunteering at a hospital, though volunteer opportunities are available in a wide range of settings, including nursing homes and community clinics.

3. **Preparing for the requisite entrance exam.** Students applying to medical school are required to take the MCAT exam. Students applying to dental programs are required to take the DAT, and applicants to optometry programs take the OAT. The MCAT, DAT, and OAT are standardized, comprehensive exams that test students’ knowledge of biological and physical sciences as well as verbal reasoning and writing skills. Exams are usually taken by students no earlier than the spring of their junior year and should be taken only if the student has completed or is within a month of completing requisite coursework. Students applying for physician assistant and physical therapy programs may be required to take the GRE, a more general exam similar to the SAT in structure and content.

**Application process**

The Pre-professional Health Programs Advising Office works with the Premedical/Predental Advisory Committee—a body of 10-12 UNH faculty members with interest and/or experience in medical/dental education—to provide students with comprehensive confidential recommendation services at the time of application. An orientation meeting is held each September to outline the application process and establish timelines/deadlines. Students should note that the medical and dental school application process begins a full two years before matriculation; i.e., in the fall of a student’s junior year if they wish acceptance following graduation. However, a delay of a year or more between graduation and admission is neither unusual nor detrimental, and in many cases, students can use this time to improve their credentials by taking additional courses and/or gaining exposure to the profession.

It is important that students understand that in order to gain admission to a health professional program they must not only satisfy the prerequisite requirements, they must satisfy these requirements at a high level of achievement. The Pre-professional Health Programs Advising Office can provide students with information on competitive grade-point average and entrance exam scores for each of the postgraduate health professional programs.

The Pre-professional Health Programs Advising Office is located in Hood House and can be contacted by phone at (603) 862-2064 or by e-mail at Premed.Advising@unh.edu. The office also has a Web site at www.unh.edu/premed-advising.

**Exchange Programs Within the U.S.**

The University offers many possibilities for exchange study with other American institutions. Exchange programs provide an educational experience in a different environment within the United States. It is hoped that students will develop new ways of viewing the country and expand their knowledge of our complex society.

Through the National Student Exchange, UNH students can study at more than 170 colleges and universities throughout the U.S. and its territories (including, but not limited to, Montana, New Mexico, Utah, Colorado, Florida, Alaska, and Puerto Rico). Several historically Black colleges and universities are exchange members and several are members of the Hispanic Association of Colleges and Universities. In addition, a one-semester or full-year exchange program is available with the University of California, Santa Cruz.

To qualify for exchange study, students must be full-time undergraduate degree candidates with at least a 2.50 grade-point average, have declared a major, receive permission from their college dean and adviser, and receive permission from the exchange coordinator.

Students in exchange programs are expected to return to UNH to complete their studies. Participation in an exchange program does not disrupt the continuity of a student’s educational process. Exchange program participants continue to maintain their status as UNH students, even while temporarily located at another university. Students thus do not have to withdraw from educational resources that are not available at the home campus and are considered appropriate for their degree programs. The consortium exchange will be used only when academic reasons or other special circumstances warrant it. Approval of the UNH adviser and college dean is required. Schools in the NHCUC consortium include Colby Sawyer College, Daniel Webster College, Franklin Pierce College, New England College, Southern New Hampshire University, Rivier College, St. Anselm College, UNH, Keene State College, and Plymouth State University. Students will remain as degree candidates and continue to pay normal UNH tuition and fees, but must make their own room and board arrangements if they plan to spend a full semester at another consortium school. For more information and application forms, students should contact the National Student Exchange Office in Hood House, (603) 862-3485.

**Off-Campus Programs**

**Consortium (NHCUC) Student Exchange Program**

Under the Student Exchange Program of the New Hampshire College and University Council (NHCUC), UNH students may be eligible to enroll for one course per semester, one semester of courses, or a full year of coursework at a member school, on a space-available basis. The consortium exchange allows matriculated undergraduates to use

UNH and later be readmitted. Maintaining UNH student status also facilitates reentry into classes, on-campus housing, and many other dimensions of University life.

Interested students should contact the National Student Exchange Office in Hood House, (603) 862-3485.

New England Land-Grant Exchange Program

In order to provide students at the New England land-grant universities with expanded access to unique programs and faculty expertise, the institutions have agreed to encourage student exchanges of one, but not more than two, semesters. To qualify, students must identify a course or combination of courses related to their area of academic interest and not available on their home campus, be degree candidates in good standing with at least a 2.50 grade-point average, be at least first-semester sophomores, and receive permission from the appropriate university exchange authorities at both the home and host institutions. Interested students should contact the National Student Exchange Office in Hood House, (603) 862-3485.

UNH/UNHM Cross Registration

Matriculated students at the University of New Hampshire and the University of New Hampshire at Manchester may take UNH courses at either location. Students must have permission from their academic advisers and must register for the courses on a space-available basis during the open registration period for each campus. For more information, students should contact James Wolf, associate registrar, Stoke Hall, or Nikki Blodgett, assistant registrar, UNH Manchester. See UNH Manchester, page 259, for course listings.

Study Abroad Programs

The University offers opportunities for full-time degree candidates meeting eligibility criteria to study abroad in many foreign institutions. UNH-managed programs are described in this section. Students may study abroad in other locations through UNH-approved programs by using the intercollegiate option (INCO). All students who study abroad pay a study abroad or exchange fee. For information on study abroad programs, students should contact the Center for International Education or the department identified in the UNH-managed program descriptions.

Study Abroad Eligibility

Students enrolled in UNH baccalaureate degree programs may participate in approved study abroad programs provided they meet the following eligibility criteria:

1. must have earned at least 32 credit hours, at least 12 of which must have been earned at the University of New Hampshire at the baccalaureate level;

2. must have a minimum of 2.5 cumulative grade point average at the time of application to and at the time of departure for the study abroad program. Study abroad programs provided by UNH or other approved institutions may have higher minimum GPA requirements;

3. must have a declared major. Transfer students, including transfer students from the Thompson School of Applied Science (TSAS) are not eligible to study abroad during the first semester of their baccalaureate program at UNH. Students enrolled in the degree programs of the Thompson School of Applied Science may participate in approved study abroad programs appropriate for two-year degree candidates. TSAS students must meet the following eligibility criteria:

1. must have earned 32 credits, at least 12 of which must have been earned at the University of New Hampshire at the associate degree level;

2. must have a minimum 2.5 cumulative grade point average at the time of application to and at the time of departure for the study abroad program. Study abroad programs provided by UNH or other approved institutions may have higher minimum GPA requirements.

Canada

New England/Québec Student Exchange Program

Students may spend one or two semesters at one of twenty French- or three English-speaking universities in the province of Québec. Eligibility requirements include a command of the language of the host campus, U.S. citizenship, and at least sophomore standing. Contact the Center for International Education, Hood House, (603) 862-2398 or study.abroad@unh.edu.

New England/Nova Scotia Student Exchange Program

Students may spend one or two semesters at one of eleven participating Nova Scotia institutions offering programs in the liberal arts, agriculture, business, engineering, art, and other fields. Eligibility requirements include U.S. citizenship and at least sophomore standing. Contact the Center for International Education, Hood House, (603) 862-2398 or study.abroad@unh.edu.

England

Cambridge Summer Program

For six weeks each summer, students from across the United States have the opportunity to participate in the UNH Cambridge Summer Program held at Cambridge University in England. Program participants take courses in English, history, and the humanities, taught by faculty from Cambridge University and UNH. Students live, dine, study, and socialize together at Gonville and Caius College, one of the oldest colleges at Cambridge. The program is open to students who have successfully completed at least one year of college; participation fulfills UNH's general education requirement under Group 5. For more information, contact the director at the Department of English, Cambridge Program Office, 53 Hamilton Smith Hall, www.unh.edu/cambridge.

Lancaster Exchange Program

Lancaster University is a comprehensive university similar to UNH in size, setting, and program offerings. The program allows students to spend a semester or a year in Lancaster while still making normal progress toward their UNH degree. Contact the Center for International Education, Hood House, (603) 862-2398 or e-mail study.abroad@unh.edu.

London Program

At Regent's College in the heart of London, the University of New Hampshire sponsors courses in British studies, the arts, humanities, and a wide range of other basic subjects offered during the fall and spring semesters. Taught by British and American faculty members, many of the courses are specifically concerned with British studies or have a special British emphasis. The program allows students to spend a semester or year in London while still making normal progress toward their U.S. degrees. To be eligible, students must have successfully completed at least one year of college, declared a major,
and achieved an overall grade-point average of at least 2.50. Interested students should contact the program coordinator, London Program Office, 53 Hamilton Smith Hall, www.unh.edu/london.

France

Summer French Language Program in Brest
Qualified students in any major may take the equivalent of FREN 503 and/or 504, the UNH intermediate French sequence, the equivalent of FREN 631 and/or 632, and/or FREN 695, a more advanced language course not offered on the UNH campus. A port city in the province of Brittany in western France, Brest is the sister city of Portsmouth, New Hampshire.

The courses are offered summer only in intensive four-week sessions at the Centre International D'Etudes des Langues (CIEL). Students generally live with local families and attend classes a total of 24 hours per week. Credit for courses completed successfully will be automatically transferred to UNH. Application deadline is April 1 for June session and April 15 for July session. For more information contact Barbara Cooper, Department of Languages, Literatures, and Cultures, Murkland Hall, (603) 862-3771.

Junior Year Program in Dijon
The Department of Languages, Literatures, and Cultures sponsors a junior year abroad program at the University of Burgundy in Dijon, France. Students generally live with French families in the heart of this historic city and take classes at the university with French students. Credit for all work completed successfully will be automatically transferred to UNH. The program is open to those who have completed FREN 631-632 and FREN 651-652, with a grade of B- or better. For more information, see Claire Malarte Feldman, Department of Languages, Literatures, and Cultures, Murkland Hall, (603) 862-1303.

Business Administration Program in Grenoble
The Whittomore School makes available a spring semester of study in international business. This is an opportunity for students interested in international business, economics, and trade to participate in an English-speaking program while gaining exposure to French culture. The semester will begin early in January with a one-week orientation and introduction to France, followed by two weeks of intensive French language.

Students will be assessed and placed in the appropriate level.

Students enroll into five or six-week courses and can earn up to 18 credits a semester. Students who successfully complete six courses receive a Certificate in International Business from Group ESC Grenoble. For more information, contact Karen Schwendeman, WSBF, McConnell Hall, (603) 862-3885 or the Center for International Education, Hood House, (603) 862-2398, e-mail study.abroad@unh.edu.

French Program in Paris
A spring semester program for intermediate-level students in Paris, France (see FREN 582/682). The program is open to all qualified students at UNH who have completed FREN 503 or higher. Courses include one French language course and four additional courses taught in English; general education and French minor credit are available. The deadline for applications is October 15, therefore students interested in this program should consult with the UNH on-campus director in the late spring or early in the fall semester. Contact Juliette Rogers, Department of Languages, Literatures, and Cultures, Murkland Hall, (603) 862-1068.

German-Speaking Countries
Students may study for a semester or a full year through any approved American study abroad program or, in special cases, by applying directly to universities in Germany, Austria or Switzerland. Most programs require a minimum grade-point average of 3.00 and a B average in the major. Programs vary greatly in academic focus, size, language of instruction, living arrangements, services and extra-curricular programming provided, and cost. Some programs accept students only for a full year. Study abroad goals and requirements should be discussed with a German adviser as early as freshman year. Program and application materials may be obtained through the Center for International Education in Hood House. For credit in the German major or minor, the program must be conducted in German. After consultation with the major adviser and the study abroad adviser to establish possible UNH course equivalents and fulfillment of major and/or general education requirements, students submit a Prior Approval Form indicating the planned course of study abroad. To ensure proper credit transfer, especially if seeking to transfer credits directly from a university abroad without benefit of an American program, students should keep syllabi, course descriptions, and all written work. Students planning study at a university in Germany, Austria, or Switzerland should note major differences in academic calendar (Winter Semester October-February, Summer Session April-July) which may be shortened by the American sponsor university to accommodate U.S. academic calendars.

Junior Year Program in Salzburg, Austria
Students who have completed GERM 504 or equivalent may enroll for one or both semesters at the University of Salzburg through the New England Universities Consortium. UNH faculty contact person is Professor Ed Larkin, (603) 862-3549.

Intensive Language Courses through the Goethe Institut
Students needing to advance rapidly in proficiency beginning at any level and at any time of year may enroll at a Goethe Institut center in Germany for courses ranging from eight to 16 weeks and receive UNH equivalent credit depending on level of exam passed upon completion of course. UNH faculty contact person is Professor Mary Rhiel, (603) 862-0063 or CIE, (603) 862-2398, e-mail study.abroad@unh.edu.

German Internship
Students who have completed GERM 504 or equivalent may apply for an unpaid 4-8 credit internship placement in a German-speaking firm or organization. The internship does not alone fulfill the study abroad requirement for the major, but may count toward the minor and may be coupled with academic course work through UNH or any study abroad program to fulfill the major study abroad requirement. The faculty contact person is Professor Nancy Lukens, (603) 862-3450.

Guatemala

Discovery Guatemala-Archaeology Semester Abroad
The semester abroad program in Guatemala provides a unique opportunity for advanced undergraduate students to experience Latin American culture while taking part in an ongoing archaeological research project. The main objective of the program is to provide students with an unparalleled experience in Maya archaeology in preparation for further research excellence and graduate careers.
Students spend the first four weeks of the program in Antigua, Guatemala’s former colonial capital, nestled in a picturesque valley in the volcanic highlands. While in Antigua students will become immersed in Guatemalan language and culture.

Weekend excursions have been planned to acquire students with the great environmental and cultural richness of the host country. Students continue their Intensive Spanish study for the eleven weeks spent at the field site at San Bartolo. The San Bartolo field camp is located in an uninhabited region of tropical forest, 1 km distance from the archaeological site of San Bartolo. Archaeological Field Methods will be introduced through a series of individual one-week supervised internships with various members of the research team. For more information, contact William Satruno, (603) 862-2518 or Stephen Reyna, (603) 862-1842.

**Hungary**

**Justice Studies Program in Budapest**

The UNH Budapest Program in Justice Studies is designed to introduce students interested in the field to a broader appreciation of the cross-cultural perspective. Each fall, fifteen UNH students spend the semester in residence at the Corvinus University of Budapest in Hungary. Hungary offers students an opportunity to witness first hand the evolution of a criminal justice system within a context of significant cultural, political, economic, and social change. Situated along the Danube in one of central Europe’s oldest cities, Corvinus offers a unique educational experience to students interested in the study of criminology, law and society, and the administration of justice. Under the supervision of a UNH faculty member also in residence, students carry a four course load, two of which are taught by the UNH faculty member. All courses are taught in English.

Eligible students must hold sophomore standing, have completed either SOC 515 or POLT 507, and one other course in the Justice Studies curriculum, and have a minimum cumulative grade point average of 2.50. Participating students will meet several times during the spring semester prior to the study abroad semester to prepare for the program. Interested students should contact the Budapest Program in Justice Studies Office at (603) 862-1716.

**Engineering and Physical Sciences Exchange Program in Budapest**

The College of Engineering and Physical Sciences has arranged an opportunity for its students to spend the fall semester of their junior year at the Budapest University of Technology and Economics (BME) in Budapest, Hungary. Courses at BME are taught in English and receive prior approval for degree credit. Students studying at Budapest, therefore, can graduate on schedule at UNH. A general education course on the language, geography, and culture of Hungary, taken at BME, is strongly suggested. The foreign student office at BME will appoint a Hungarian adviser for each student and will assist in obtaining housing either in dormitories, or in apartments. Further information is available from the college’s educational assistant and the college’s academic counselor, Bobbi Gerry; or the coordinator of student programs, Center for International Education, Hood House, or Professor Andrzej Rucinski, Foreign Exchange Program Coordinator, (603) 862-1381. For more information, visit the program’s Web site at [http://www.ceps.unh.edu/academics/budapest.html](http://www.ceps.unh.edu/academics/budapest.html).

**WSBE in Budapest**

The Whitemore School of Business and Economics has partnered with the Corvinus University of Budapest (formerly Budapest University of Economics Sciences and Public Administration) to offer students a unique opportunity to live and study in beautiful Budapest, Hungary. This partnership allows WSBE students to take courses at CUB in the fall semester that directly transfers into the core of the Business Administration or Economics degrees and into most business options. This ensures that students can study abroad and graduate on time. Moreover, Budapest is developing into a commercial and financial center for many U.S. companies. Its importance for the U.S. economy is growing rapidly.

Students travel to Budapest in the last week of August. A WSBE faculty member meets students at the airport and sets them up in apartments in the city that are close to the University. The school works to make the transition to life in a foreign culture as simple and easy as possible. Additionally, in the future a WSBE faculty member will be teaching at the CUB during the study abroad semester.

**Italy**

**UNH-in-Italy in Ascoli Piceno**

Students may participate in the UNH-in-Italy Program in the medieval city of Ascoli Piceno, for a semester, a year, or a summer session (see ITAL 685-686).

Academic Year Program. Students live either with Italian families or in apartments in the heart of the city and take UNH courses, taught in English, by UNH faculty. Students with advanced language skills may take courses taught in Italian. Internships are possible. There is no language prerequisite. Students must have a cumulative grade-point average of at least 2.50 and at least sophomore standing. For further information, contact Piero Garofalo, Department of Languages, Literatures, and Cultures, Murkland Hall, (603) 862-3769.

Summer Program. UNH-in-Italy offers two different summer options. One is a four-week, 4-credit workshop in painting. The other is a five-week, 8-credit program in Italian studies. Students live in apartments in the historic center of the city. Field trips to such locations as Venice, Rome, Bologna, Perugia, Urbino, Florence, and Assisi are included. For further information regarding the painting workshop, contact Grant Drumheller, Department of Art and Art History, Paul Creative Arts Center, (603)862-1351. For further information regarding the Italian Studies Program, contact Piero Garofalo, Department of Languages, Literatures, and Cultures, Murkland Hall, (603) 862-3769.

**Japan**

**Kansai Gaidai University, Osaka**

Students may spend one or two semesters at Kansai Gaidai University in Osaka, Japan. Program participants study the Japanese language, business, politics, literature, fine arts, and other courses. Eligibility requirements include a 3.00 grade-point average and sophomore, junior, or senior standing. Contact the Center for International Education, Hood House, (603) 862-2398 or e-mail study.abroad@unh.edu.

**Mexico**

**Puebla Program**

A six-week summer program in Puebla, Mexico open to all students who are interested in taking summer courses at the Universidad de Las Américas. Students must have a cumulative grade point average of
2.50. Credit for courses completed successfully will be transferred to UNH. For more information, contact Professor Lina Lee, Department of Languages, Literatures and Cultures, Murkland Hall, (603) 862-3123, or go to www.unh.edu/spanish/mexico.htm.

The Netherlands
Utrecht University
The Center for International Education administers an exchange program with Utrecht University, open to undergraduate and graduate students in all fields. Utrecht University is one of the top research universities in Europe, with the largest undergraduate population and the largest research budget in the Netherlands. The size, status, and international population of the university ensure that courses in all areas of study are offered in English. This is an especially good exchange for students wanting to combine a study abroad option with work in their majors.

Utrecht University has strengths in the sciences, especially in health care, the biological sciences, and physics. The veterinary program is the only one in Europe accredited in North America. The School of Economics offers programs in international business, marketing, and finance. The School of Law, open to qualified undergraduates, specializes in international law, comparative citizenship and immigration law, and comparative constitutional studies. In the humanities, advanced undergraduates and graduate students at all levels will find especially good opportunities in Atlantic History, linguistics, early modern studies, anthropology, international relations, women's studies, museum studies, art, European cultural studies, studies in race, immigration, ethnicity, citizenship, justice studies, and American studies. Utrecht University also offers Dutch as a second language, from conversational to intensive and professional, for international students.

Located in an especially lovely section of central Holland, Utrecht is the fourth largest city in the Netherlands. It has a classically old-Dutch city center with seventeenth-century buildings, a medieval church, several high-quality museums and terraced canals that encircle the old city. A university town since the medieval period, Utrecht has long enjoyed a vibrant student culture. Utrecht is easily navigable by foot, bicycle, and bus, and, as the center of the Dutch rail system, enjoys easy access to other cities in the Netherlands and Europe (Amsterdam is 35 minutes away; Paris three hours; London a day trip by plane). Interested students should contact the Center for International Education, Hood House, (603) 862-2398.

New Zealand
UNH-EcoQuest, New Zealand
In partnership with the UNH Department of Natural Resources, the EcoQuest Education Foundation offers an intensive program of applied field studies in ecology, resource management, and environmental policy. New Zealand offers an ideal context for multidisciplinary, field-oriented studies, with its rich cultural traditions, diverse ecosystems, expansive natural areas, and history of innovative approaches to resource management. EcoQuest students engage hands-on, in New Zealand's restoration ecology and sustainable resource management initiatives. Semester participants have the opportunity to carry out directed research projects while working closely with a faculty mentor and in association with New Zealand research partners. The rural seaside campus is located about an hour's drive southeast of Auckland. Students travel throughout New Zealand’s North and South Islands to learn more about the unique ecosystems and local culture.

Students may choose from a four-course, 15-week fall or spring term for 16 credit hours, or a two-course, five-week summer session for 8 credit hours. The UNH-EcoQuest Academic program coordinator is Dr. Kimberly Babbitt. Contact Donna Dowlah, the UNH-EcoQuest director of admissions, (603) 862-2036.

Puerto Rico
University of Puerto Rico at Mayaguez
Students may spend one or two semesters at the University of Puerto Rico (UPR) at Mayaguez, the second largest of the three major campuses in the UPR system. While having the opportunity to learn in a Latin American environment, participants maintain their status as UNH students, pay UNH tuition, and will be able to graduate from UNH on schedule. The exchange is open to students and faculty members from all UNH majors. Since 80 percent of all courses at UPR are taught in Spanish, participants must be proficient in Spanish. Students must contact Paula DiNardo, National Student Exchange Office, Hood House, (603) 862-3485.

Scotland
Heriot-Watt University Exchange Program
College of Engineering and Physical Sciences students are eligible to participate in a spring semester exchange with Heriot-Watt University in Edinburgh, Scotland. The current program is designed for civil and environmental engineering majors. For more information, contact Ray Cook at (603) 862-1411, or e-mail ray.cook@unh.edu.

Spain
Granada Program
The Granada Program is administered by the Spanish program of the University of New Hampshire. Students may spend one or two semesters in a program designed for those who have completed SPAN 631 or its equivalent, have a B average in Spanish and a cumulative grade-point average of 2.50, and have at least sophomore status. Courses taught by professors from the University of Granada fulfill requirements for the Spanish major and minor and general education requirements in humanities areas. Deadlines for fall applicants is March 1; for spring applicants, October 1. For further information, contact the Spanish Program, Murkland Hall.

Other Programs
Reserve Officer Training Corps (ROTC) Programs
(For course descriptions, see page 147 and 214.)
Students attending the University of New Hampshire may enroll in the Air Force Reserve Officer Training Corps (AFROTC) or in the Army Reserve Officer Training Corps (AROTC) at the University of New Hampshire (UNH).

The Army ROTC and Air Force ROTC offer programs leading to a commission as a second lieutenant in their respective services. Students in either ROTC program may pursue any University curriculum that leads to a baccalaureate or higher degree. Two- and four-year programs are available. The four-year program is open to freshmen, sophomores, and transfer students. The two-year program is open to students who have at least two academic years remaining within their college/university degree program. In addition to on-campus course requirements, students must attend an officer preparatory training session for a part of one summer.
ROTC scholarships are offered on a competitive basis by both the Army ROTC and Air Force ROTC. Entering freshmen may compete for four-year scholarships during their last year of high school. Additionally, incoming students may compete for scholarships while already in college if they meet specific ROTC requirements. Scholarships may pay up to full tuition, mandatory fees, and required textbooks for college courses. Incoming students with either a four-year or three-year ROTC scholarship may receive a full or partial room and board grant for the entire time they are on an ROTC scholarship. In addition, all scholarship recipients receive a tax-free monthly subsistence allowance. Non-scholarship students in the last two years of the ROTC program also receive the tax-free monthly subsistence allowance.

Both ROTC programs have administrative and medical requirements, which must be met to qualify for a scholarship and a commission.

More specific information about ROTC programs may be obtained by contacting Army ROTC at (603) 862-1078 or Air Force ROTC at (603) 862-1480.
The Thompson School of Applied Science, established in 1895, is a division of the College of Life Sciences and Agriculture within the University offering the associate in applied science degree. The Thompson School of Applied Science offers 13 program specializations. They comprise a balance of professional, science-related, and general education courses in applied curriculums that prepare students to meet the specific demands of a technical or applied profession, continuing education, and the general demands of life.

The faculty at the Thompson School of Applied Science have significant work experience in industry and business; extensive and up-to-date knowledge of their specialties; ongoing contacts with practicing professionals; dedication to students and to excellence in education; and a commitment to practical, science-based education. They work closely with students, providing academic advising, career counseling, and special assistance when needed.

Located at the western edge of campus, the Thompson School's classrooms, laboratories, and working enterprises are designed for career-related experience under realistic conditions.

Barton Hall contains an animal science lab, a food preparation lab, a state-of-the-art grooming facility, several classrooms, and faculty offices.

Cole Hall includes a 150-seat lecture auditorium, a restaurant-style kitchen and dining area, a student study and lounge area, a computer laboratory, a small classroom, and administrative offices.

Putnam Hall houses an architecture lab, a surveying and mapping lab, a Geographic Information System (GIS) lab, a computer-aided design (CAD) laboratory, an agricultural mechanization shop (welding, engines), classrooms, and faculty offices.

- Students enrolled in Restaurant Management gain practical experience in three campus restaurants: the UNH Dairy Bar, and Stacey's and the Balcony Bistro, both located in Cole Hall and operated during the academic year. A paid supervised internship of 400-600 hours is required over the summer between the first and second year of studies to provide students with industry experience.

- Forest Technology students integrate all aspects of forest management as they complete projects on the nearly 3,000 acres of University land. Using the school's sawmill and harvesting equipment, they contribute to the sustainable management of UNH lands. In the classroom and the forest they develop skills and techniques in boundary surveying, mapping, forest inventory, forest planning, reforestation and forest land protection.

- Horticultural Technology students have the use of the Thompson School horticultural facility, with glass and poly covered greenhouses, propagating facilities, refrigerated compartments, display gardens, and the campus arboretum.

- Business Management students focus on small-to-medium size enterprises and gain real world experience through internships and courses such as Applied Sales. The capstone course, Business Policy, is designed so students can create their own business to market a product and generate revenues used to support scholarships and special projects.

- Whether the specialty is dairy, equine or small animals, students in Applied Animal Science utilize professional quality facilities on campus, such as the Dairy Center or Grooming Lab. The University's herd of Morgans, Thoroughbreds, and Warmbloods are ridden on nearby trails, and in the outside or indoor arenas during class sessions.

- Civil Technology students have a variety of classroom experiences ranging from an in-lab materials testing facility to two Civil Technology computer facilities with 24 hour, 7 day access featuring the latest software for surveying and mapping, architectural and computer aided design. GPS (Global Positioning System) software is also available. The Civil Technology suite of spaces provides a ready access to learning and development.

- Dietetic Technician students learn to assess dietary intakes and make nutrition recommendations using the most up-to-date nutrient analysis software. Outside the classroom, students make a positive impact on the lives of others through 450 hours of supervised practice that may include such activities as teaching nutrition to preschool children, providing nutrition education in a clinic for pregnant women, and promoting healthy eating to clients in a weight management program.
\textbf{THOMPSON SCHOOL OF APPLIED SCIENCE}

- Students majoring in Community Leadership gain enriching experiences working with organizations such as Families First, NH Housing Partnership, Red Cross, New Hampshire Public Television's station and on-campus groups. Students are involved with creating, operating and evaluating these service-learning activities.

\textbf{Associate in Applied Science Degree}

To graduate with an associate in applied science degree, a student must complete specified coursework in general education, technical specialization, and general electives (see the following list), with an overall grade-point average of no less than 2.00 (out of 4.00). In addition, students must earn the minimum number of total credits required for each specialization.

\textbf{General Education}

These are courses designed for personal and professional development with special emphasis on the ability to think critically, to communicate effectively, to understand computer technology, and to process quantitative data. In addition, they serve to acquaint the student with some of the major modes of thought necessary to understand oneself, others, society, and the environment.

In this area a student must complete:
- one course in computer literacy;
- one course in mathematics;
- two to three courses in communications, to include COM 209, Expository Writing and Reading, plus elective(s);
- two to three courses in social sciences, the arts, or the humanities, to include either SSCI 201 Human Relations, or SSCI 202 Social Issues, plus an elective.

\textbf{Technical Specialization}

These are courses designed to develop the necessary scientific knowledge, technical skills, and practical experience required for employment in a professional discipline. Each student must complete all technical courses specified in the selected program of study.

See the Program of Study sections for information.

\textbf{General Electives}

This component of the degree program allows the individual to pursue courses of personal or professional interest. In this area, a student may choose a number of courses in each program of study specified as electives.

These may be chosen from courses offered by the Thompson School or from other selected University undergraduate courses with adviser approval.

\textbf{Full-Time and Part-Time Programs}

The associate in applied science degree at the Thompson School can be completed by pursuing either a full-time or part-time program. Most students enroll in the full-time program. This allows completion of a program of study in four semesters (the traditional two-year period). The sequence of required courses and semester schedules for each program is defined throughout this catalog.

Some students who cannot attend on a full-time, two-year schedule or who wish to spread the financial investment of a college education over a broader period, elect the option of part-time study. This allows students to work toward completion of the degree over an extended period, typically two calendar years to five academic years. The schedule can be shortened or lengthened to meet the needs of the individual student. For further information please contact the Thompson School at (603) 862-1025 or (603) 862-3115.

\textbf{Admissions}

The Thompson School welcomes applications from both high school and adult students.

High school students who plan to enter the Thompson School after graduation will be considered on the basis of high school course selection, academic achievement, class rank, and high school recommendations. Emphasis is placed on the applicant's academic achievement, personal motivation, demonstrated interest in a career field, and preparation for Thompson School programs.

All traditional-age students must submit the results of the Scholastic Assessment Test (SAT-I). Adult students who have been out of high school for a number of years may request that the Office of Admissions waive the SAT-I requirement.

For an adult student who graduated from high school several years ago, the Office of Admissions will consider not only his or her academic record but also accomplishments since high school. Important factors will include professional work and advancement and motivation to succeed in Thompson School courses. In addition, applicants will be considered on the basis of any available test scores such as General Education Development (GED), Scholastic Assessment Test (SAT-I), and College Level Examination Program (CLEP); letters of reference; previous college study; and military record (if applicable).

A number of Thompson School specializations require satisfactory work in specific high school preparatory courses. These admission requirements are listed under each career specialization in this catalog.

\textbf{How to Apply}

You may request an application for admission and additional information from either of the following offices: UNH Office of Admissions, Grant House, 4 Garrison Avenue, Durham, NH 03824-3510, (603) 862-1360; or Thompson School of Applied Science, Cole Hall, 291 Mast Road, Durham, NH 03824-3562, (603) 862-1025.

Applications may be submitted from September through mid-July. Notice of admission to the Thompson School will normally be sent within 30 days following receipt of all required information.

Please note: Priority deadlines for those students requesting UNH residential housing is February 1 for the fall semester and November 1 for spring semester. Housing assignments will be handled on a space-available basis after February 1. The UNH financial aid deadline is March 1 for the following academic year.

\textbf{Campus Visits}

Prospective students are encouraged to participate in an interview at the Thompson School, attend an open house, and/or take a tour of the Thompson School and the rest of the UNH campus. Interviews are recommended but not required. An open house is held in the fall. To attend the open house or to arrange your visit, please contact the Thompson School at (603) 862-1025 or visit our Web site at www.unh.edu/thompson-school.

\textbf{Expenses, Financial Aid, and Scholarships}

Costs for students include tuition, fees, room and board, books and supplies, and personal and travel expenses. These costs are the same for any student enrolled at the University of New Hampshire (see Fees and Expenses, page 14) and students majoring at the Thompson School have access to the same student services. (See also Campus Life, Programs and Services for Students, and Health Services.) Required curriculum and lab fees for Thompson School programs are listed with each specialization.
For information about scholarships, loans, and work-study, write the Financial Aid Office, Stoke Hall, 11 Garrison Avenue, Durham, NH 03824-3511; or call (603) 862-3600. A financial aid form must be on file to be considered for many scholarships. (See also Financial Aid, page 5.)

The Thompson School and the College of Life Sciences and Agriculture (of which the Thompson School is a division) also provide scholarship opportunities for Thompson School students. Call (603) 862-1025 for a list of these possibilities or visit our Web site at www.unh.edu/tsas/scholarships.

New England Regional Student Program
The Thompson School of UNH participates in the New England Regional Student Program of the New England Board of Higher Education, in which each state university system in New England offers a number of regional curricula to students from other New England states. Under this program, students pay in-state tuition plus 75 percent. See the following table for Thompson School programs that are eligible in 2006-2007. Eligibility under this program may vary from year to year, so it is suggested that you obtain further information by contacting the New England Board of Higher Education, 45 Temple Place, Boston, MA 02111; (617) 357-9620. You may also contact the UNH Office of Admissions or the Thompson School for more information.

<table>
<thead>
<tr>
<th>Associate Degree Program</th>
<th>Available to Residents of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Animal Science</td>
<td>MA, ME, RI, VT</td>
</tr>
<tr>
<td>Dairy Management</td>
<td>MA, ME, RI, VT</td>
</tr>
<tr>
<td>Equine Management</td>
<td>MA, ME, RI, VT</td>
</tr>
<tr>
<td>Small Animal Care</td>
<td>MA, ME, RI, VT</td>
</tr>
<tr>
<td>Civil Technology</td>
<td>CT, RI</td>
</tr>
<tr>
<td>Architectural Technology</td>
<td>CT, RI</td>
</tr>
<tr>
<td>Construction Management</td>
<td>CT, RI</td>
</tr>
<tr>
<td>Surveying and Mapping</td>
<td>CT, RI</td>
</tr>
<tr>
<td>Community Leadership</td>
<td>CT, MA, ME, RI, VT</td>
</tr>
<tr>
<td>Food Services Management</td>
<td>MA, RI, VT</td>
</tr>
<tr>
<td>Dietetic Technician</td>
<td>MA, RI, VT</td>
</tr>
<tr>
<td>Restaurant Management</td>
<td>MA, RI, VT</td>
</tr>
<tr>
<td>Forest Technology</td>
<td>CT, MA, RI, VT</td>
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<tr>
<td>Horticultural Technology</td>
<td>RI</td>
</tr>
<tr>
<td>Landscape Operations</td>
<td>RI</td>
</tr>
<tr>
<td>Ornamental Horticulture</td>
<td>RI</td>
</tr>
</tbody>
</table>

Transfer Opportunities
UNH invites Thompson School graduates to continue their education at the University. Many of the associate degree programs offered by the School have baccalaureate degree counterparts. Specifically, these counterparts include civil engineering, forestry, environmental horticulture, animal sciences, dairy management, nutritional sciences, business administration, and hospitality management. Many other baccalaureate majors are also available. A final cumulative grade-point average of at least 2.50 is required for transfer to most programs; some UNH baccalaureate programs require a higher cumulative grade-point average. Successful completion of a baccalaureate degree usually requires a minimum of two years of additional study at the University. Other colleges and universities also welcome graduates from the Thompson School, especially those within the University System of New Hampshire.

Program Abbreviations
The following abbreviations are used to identify courses which are part of Thompson School of Applied Science programs.

AM Agricultural Mechanization
AAS Applied Animal Science
ABM Applied Business Management
ANSC Animal and Nutritional Science
CT Civil Technology
COM Communications
CSL Community Leadership
CD Community Development
FSM Food Services Management
FORT Forest Technology
HT Horticultural Technology
MTH Mathematics
NUTR Nutrition
PBIO Plant Biology
SSCI Social Science
ZOOL Zoology

Curriculum Fee
Applied animal science, all specializations: $522*

Applied Animal Science Curriculum Standards
Applied Animal Science students must maintain a minimum 2.00 cumulative grade-point average in AAS classes after 2 semesters (26 credits) to take additional AAS classes. Students with AAS averages lower than 2.00 must repeat classes with lower grades and raise their average to the required 2.00 before taking additional AAS classes. Students must have a minimum cumulative 2.00 grade-point average in AAS classes to qualify for graduation from the program.

Programs of Study
Thompson School Associate Professors: Eugene P. Alibrio, Timothy E. Barretto, Charles A. Caramihalis, Kenneth L. Flesher, Benjamin P. Fowler, Rene J. Gingras, M. Katharine Hanson, Nancy M. Johnson, Dana M. Sansom, David E. Tooch, Steven D. Tuttle, Jerilee A. Zezula

*This one-time, nonrefundable curriculum fee is required to cover lab materials, specialized equipment maintenance, and transportation that is unique to the applied nature of the specialization. The curriculum fee covers the entire two-year course of study for one specialization. Any non-TSAS student may be assessed specific course fees, details of which are included in each semester’s Time and Room Schedule. All fees are subject to change.
Dairy Management
To work in the highly technical, rapidly changing field of dairy management, students must become well versed in the many aspects of dairy farm operation and management. In the dairy management specialization, students put many of the skills learned in the classroom into practice immediately. Students learn to balance rations, identify and treat diseases, read a bull proof, and gain many other skills. They work at the University's dairy farm, a modern and well-equipped teaching and research center, where students work with each other to manage the CREAM (Cooperative for Real Education in Agriculture) herd.

Students learn the business of farming through field exercises in land management, forage production, financial management, and computer use on a dairy farm as well as continued practical experience with cattle. The program prepares students to work both on the farm or in related businesses.

Thompson School Dairy Management has a unique arrangement with the Animal and Nutritional Sciences (ANSC) Baccalaureate Dairy Management major. Students may start with the Thompson School program, obtain their Associate in Applied Science (A.A.S.) degree then transfer to ANSC and obtain a B.S. in two additional years with a full time course of study. This allows students to receive two degrees in as little as four years or obtain their A.A.S. degree and work in the field to later return for a B.S. Students wishing to follow this course of action need to work closely with their advisers and maintain a C or better in key Applied Animal Science courses.

Career Opportunities: Herd manager, agricultural sales and/or service employee, farm manager, artificial insemination (AI) technician, crop manager, farm or farm business owner.

Dairy Management Program of Study
First Year, Fall Semester
AAS 228, Anatomy and Physiology of Domestic Animals, 4 cr.
AAS 231, Introduction to Animal Science, 4 cr.
AAS 244, Introduction to Dairy Management, 4 cr.
AAS 278, AAS Computer Applications, 1 cr.
COM 209, Expository Writing and Reading, 4 cr.

First Year, Spring Semester
AAS 223, Dairy Selection, 2 cr.
AAS 234, Equipment and Facilities Management, 3 cr.
AAS 239, Fundamentals of Animal Health, 3 cr.
AAS 242, Introduction to Business, AAS, 2 cr.
COM 212, Technical Writing, 2 cr.
MTH 202, Math II, 3 cr.

Second Year, Fall Semester
AAS 232, Animal Forages, 3 cr.
AAS 235, Animal Nutrition, 3 cr.
AAS 246, Animal Business Applications, 4 cr.
AAS 275, CREAM (Cooperative for Real Education in Agriculture) Program, 4 cr.
AAS 297, Work Experience (summer), 0 cr.
SSCI class, 2-4 cr.

Second Year, Spring Semester
AAS 240, Animal Breeding, 3 cr.
AAS 275, CREAM Program, 4 cr.
SSCI 201, Human Relations or SSC 202, Social Issues, 4 cr.

Recommended electives include
AAS 221, Large Animal Behavior and Handling, 2 cr.
AM Agricultural Mechanization courses
Total: 67-70 credits

Equine Management
As part of new leisure industries, the equine industry in New England encompasses many different facilities and disciplines. Students in the equine management specialization combine courses in the most recent technical information with related practical experience. They gain hands-on experience in bandaging, selection, ration-balancing by computer, fitting and care of equipment, and farm and barn analysis. They also acquire decision making and managerial skills. Graduates have a solid basis for direct employment opportunities yet enough flexibility to further their education.

The riding focus at UNH is balance seat with schooling in dressage, cross country, and stadium jumping. Thompson School students in horsemanship classes ride in the UNH program and have the opportunity to compete in intercollegiate shows.

Thompson School Equine Management has an articulation agreement for students wishing to pursue a B.S. from ANSC following graduation from the Thompson School. This B.S. would be obtained either in Equine Industry and Management (Track I) with four additional semesters or in Therapeutic Horseback Riding (Track II) in five additional semesters. With this articulation, students may obtain both an Associate Degree in Applied Science (A.A.S.) and a B.S. in as little as four years with full-time coursework or obtain their A.A.S., work in the field and return for their B.S. Students wishing to take advantage of these articulation agreements need to work closely with their advisers.

Career Opportunities: Barn manager, breeding farm manager, sales (tack shops, grain stores), horse show manager, veterinary assistant/equine practice, riding instructor.

Equine Management Program of Study
First Year, Fall Semester
AAS 228, Anatomy and Physiology of Domestic Animals, 4 cr.
AAS 231, Introduction to Animal Science, 4 cr.
AAS 237, Equine Management Techniques, 4 cr.
AAS 278, AAS Computer Applications, 1 cr.
COM 209, Expository Writing and Reading, 4 cr.

First Year, Spring Semester
AAS 226, Equine Conformation and Lameness, 4 cr.
AAS 236, Equine Show Preparation and Competition, 1 cr.
AAS 234, Equipment and Facilities Management, 3 cr.
AAS 239, Fundamentals of Animal Health, 3 cr.
AAS 242, Introduction to Business, AAS, 2 cr.
COM 212, Technical Writing, 2 cr.
MTH 202, Math II, 3 cr.

Second Year, Fall Semester
AAS 232, Animal Forages, 3 cr.
AAS 235, Animal Nutrition, 3 cr.
AAS 246, Animal Business Applications, 4 cr.
AAS 247, Applied Equine Management, 3 cr.
AAS 297, Work Experience (summer), 0 cr.
SSCI class, 2-4 cr.
ANSC 402, Horsemanship, 3 cr.

Second Year, Spring Semester
AAS 240, Animal Breeding, 3 cr.
AAS 252, Advanced Equine Management, 4 cr.
AAS 253, Equine Competition Management, 2 cr.
SSCI 202, Social Issues, 4 cr.
Electives 2-5 cr.

Recommended electives
AAS 272, Comparative Equine Operations
AAS 293, Equine Field Operations
ANSC 507, Equine Discipline (ANSC 402 is a prerequisite)
Total: 65-69 credits

Small Animal Care
Animal companionship provides millions of people an oasis in a hectic, impersonal world, and pet owners consistently seek additional advice on the care of their animals. The small animal care specialization prepares students to work in companion animal care positions of all types.

In their first year, students gain experience in breed types, behavior, genetics, restraint, and training of dogs and cats. Students also master laboratory procedures such as fecal examination and heartworm testing. In addition, the students learn the basics of grooming, nutrition, first aid, disease prevention, medication administration, and toxicology. During their second year, students spend four hours a week at
the NHSPCA performing all aspects of animal care and continue with their academic subjects.

Small Animal Care is very flexible with recommended elective courses. Second year students choose classes based on their career goals. Career tracks include veterinary hospital employment, employment in the humane/animal control fields, employment or ownership within the boarding/grooming/daycare industry, or positions in laboratory animal care.

Career Opportunities: Veterinary assistant, laboratory animal caregiver, pet store manager, pet groomer, kennel manager, animal care and control technician, animal-assisted activities/therapy volunteer and/or coordinator.

Small Animal Care Program of Study

First Year, Fall Semester
AAS 228, Anatomy and Physiology of Domestic Animals, 4 cr.
AAS 230, Small Animal Breeds and Behavior, 4 cr.
AAS 231, Introduction to Animal Science, 3 cr.
AAS 278, AAS Computer Applications, 1 cr.
COM 209, Expository Writing and Reading, 4 cr.

First Year, Spring Semester
AAS 222, Small Animal Grooming I, 2 cr.
AAS 239, Fundamentals of Animal Health, 3 cr.
AAS 242, Introduction to Business, AAS, 2 cr.
AAS 249, Small Animal Care Techniques, 2 cr.
COM 212, Technical Writing, 2 cr. or
COM 211, Critical Reading, 2 cr.
MTH 202, Math II, 3 cr.
Electives 1-3 cr.

Second Year, Fall Semester
AAS 235, Animal Nutrition, 3 cr.
AAS 246, Animal Business Applications, 4 cr.
AAS 279, Small Animal Care Practicum, 2 cr.
AAS 297, Work Experience (summer), 0 cr.
SSCI 201, Human Relations, 4 cr.
AAS Electives 2-5 cr.

Second Year, Spring Semester
AAS 224, Small Animal Management, 4 cr.
AAS 240, Animal Breeding, 3 cr.
AAS 279, Small Animal Care Practicum, 2 cr.
AAS Electives, 2-4 cr.
SSCI Class, 2-4 cr.
Electives 2-3 cr.

Recommended AAS electives
AAS 221, Large Animal Behavior and Handling, 2 cr.
AAS 222, Small Animal Diseases, 2 cr.
AAS 233, Small Animal Grooming I, 2 cr.
AAS 236, Equine Show Preparation and Competition, 1 cr.
AAS 237, Equine Management Techniques, 4 cr.
AAS 251, Human/Animal Bond, 2 cr.
AAS 254, Animal Assisted Activities and Therapy, 2 cr.
AAS 257, Small Animal Diseases Lab (AAS 227 Prereq), 1 cr.
AAS 276, Introduction to Lab Animals, 2 cr.
AAS 277, Lab Animal Practicum, 1 cr.
ABM courses (permission required)
ANSC 402, Horsemanship

Total: 64-70 credits

Admissions Requirements
Applicants to the dairy management, equine management, and small animal care specializations must present at least one year of satisfactory work in college preparatory biology and two years of college preparatory math. One year of high school chemistry is also highly recommended. Students with weaknesses in these academic areas are encouraged to take refresher classes before starting their coursework in the applied animal science program.

Applied Business Management (ABM)
www.unh.edu/tsas/academics/business/
(For course descriptions, see page 252.)

The Applied Business Management program combines classwork and practical experience to give students a thorough understanding of the business field. The core curriculum includes accounting, marketing and sales, human resource management, computer applications, communications, business law and strategic management for small business. Students may select from a variety of UNH electives.

Practical experience is gained through projects with local industries, municipalities and state agencies, and student-run businesses. Students may also elect to develop internships with area businesses.

Curriculum Fees
Applied Business Management: Business Management $114*

Business Management
Small- to medium-sized businesses represent the largest and fastest growing segment of the state and regional economy.

The Business Management program is specifically designed for students who wish to seek entry-level management positions in existing firms, prepare for management of a family-owned business, or start a new business. Business management students gain practical exposure to essential topics in business management that prepares them to seek further specialization in a business area or to prepare for transfer to a baccalaureate program.

Career Opportunities: Office manager, entrepreneur, management trainee programs, assistant manager, purchasing and inventory controller, bookkeeper, domestic and international sales professional, business owner.

Business Management Program of Study

First Year, Fall Semester
ABM 204, Principles of Management, 4 cr.
ABM 205, Applied Financial Accounting, 4 cr.
COM 209, Expository Writing and Reading, 4 cr.
MTH 201, Math I, 3 cr.
or MTH 202, Math II, 3 cr.

First Year, Spring Semester
ABM 207, Applied Marketing, 4 cr.
ABM 208, Managerial Accounting, 4 cr.
ABM 226, Business Computer Applications, 4 cr.
COM 210, Public Speaking, 2 cr.
Electives 4 cr.

Second Year, Fall Semester
ABM 202, Professional Writing, 3 cr.
ABM 206, Human Resource Management, 4 cr.
ABM 214, Applied Sales, 4 cr.
SSCI 201, Human Relations, 4 cr.
Electives 2-4 cr.

Second Year, Spring Semester
ABM 211, Business Policy, 4 cr.
ABM 232, Business Law, 4 cr.
Social Science Elective 2-4 cr.
Electives 4 cr.

Total: 64-66 credits

Admissions Requirements
Students entering the business management program must have a minimum of two years of college preparatory mathematics (preferably three). Several ABM courses require a strong background in basic mathematics and algebra.

*This one-time, nonrefundable curriculum fee is required to cover lab materials, specialized equipment maintenance, and transportation that is unique to the applied nature of the specialization. The curriculum fee covers the entire two-year course of study for one specialization. Any non-TSAS student may be assessed specific course fees, details of which are included in each semester’s Time and Room Schedule. All fees are subject to change.
Civil Technology (CT)
www.unh.edu/tsas/academics/civiltech/
(For course descriptions, see page 253.)

Civil Technology is a dynamic educational opportunity offering skill-based learning through class instruction, extensive laboratory experience, fieldwork, as well as portfolio opportunities. Students choose from one of the following specializations: architectural technology, construction management, or surveying and mapping.

The cornerstone of the educational experience is instruction in computer-aided design (CAD) and parametric modeling using the Thompson School's state-of-the-art CAD labs. Students in surveying use the latest GPS and surveying equipment and students studying geographical information systems (GIS) use the new GIS Instructional Lab. Additional coursework covers building science, construction contracting, materials, soils, and methodologies of professional practice in the concentration specialties.

Curriculum Fees
Civil technology, all specializations: $76*

Architectural Technology
In the Architectural Technology specialization, students expand on the broad construction-related base of the Civil Technology curriculum. From faculty who are experienced, registered architects and engineers, students are introduced to the technical skills used in the architectural profession, including computer-aided design (CAD), parametric modeling, and building science-related technologies. Course content includes engineering-based as well as design-based disciplines. The courses, when coupled with recommended electives, provide students with a substantial knowledge base for architecturally related careers. While some graduates continue their studies in accredited baccalaureate programs and become registered architects, most find work in technical support positions within the design and construction industries in either private companies or public/government entities.

Career Opportunities: Architectural technician, CAD designer, public works operations, land development planner, facilities management, engineering aide, or construction supervisor.

Architectural Technology Program of Study
First Year, Fall Semester
CT 220, Professional Practice, 1 cr.
CT 222, Computer Aided Design Level I, 4 cr.
CT 223, Introduction to Surveying and Mapping, 3 cr.
CT 224, Surveying and Mapping Lab, 2 cr.
AM 280, Technical Computer Literacy/Internet Applications, 4 cr.
MTH 203, Algebra and Trigonometry, 3 cr.

First Year, Spring Semester
CT 231, Design I, 4 cr.
AM 275, Building Science/Residential Construction, 4 cr.
COM 212, Technical Writing, 2 cr.
or
COM 210, Public Speaking, 2 cr.
SSI 204, Leadership Effectiveness and Group Performance, 2 cr.
E elective, 4 cr.

Second Year, Fall Semester
CT 227, Mechanical & Electrical Systems, 4 cr.
CT 247, Construction Contracting, 4 cr.
CT 281, Architecture History and Design, 4 cr.
CT 297, Work Experience, 0 cr.
COM 209, Expository Writing and Reading, 4 cr.

Second Year, Spring Semester
CT 282, Architecture II, 4 cr.
SSI 202, Social Issues, 4 cr.
**Technical Elective, 4 cr.
E elective, 4 cr.

Total: 65 credits

Construction Management
In the Construction Management specialization, students prepare for careers in land development, construction contracting and management, and land-use planning. Students learn not only how to build well but how to build wisely. They study construction and its related technologies, dealing with material selection and design, and design of foundation and drainage systems. They also examine environmental and land development issues by studying residential and commercial septic and waste disposal systems, recycling, and effective energy management. Some graduates elect to continue their education in bachelor of science programs in civil engineering or community development.

Graduates of the Construction Management specialization find employment in a variety of building industry-related positions.

Career Opportunities: Construction supervisor, project manager, cost estimator, public works department, contractor, code enforcement officer, construction material tester, land-development planning, site evaluator for building components, construction product manufacturer, product representative, DOT engineering technician.

Construction Management Program of Study
First Year, Fall Semester
CT 220, Professional Practice, 1 cr.
CT 222, Computer Aided Design Level I, 4 cr.
CT 223, Introduction to Surveying and Mapping, 3 cr.
CT 224, Surveying and Mapping Lab, 2 cr.
AM 280, Technical Computer Literacy/Internet Applications, 4 cr.
MATH 203, Algebra and Trigonometry, 3 cr.

First Year, Spring Semester
CT 231, Design I, 4 cr.
CT 227, Mechanical & Electrical Systems, 4 cr.
CT 247, Construction Contracting, 4 cr.
CT 281, Architecture History and Design, 4 cr.
CT 297, Work Experience, 0 cr.
COM 209, Expository Writing and Reading, 4 cr.

First Year, Spring Semester
CT 231, Design I, 4 cr.
CT 227, Construction Surveying, 4 cr.
CT 237, Land Design and Regulations, 4 cr.
COM 212, Technical Writing, 2 cr.
or
COM 210, Public Speaking, 2 cr.
SSI 204, Leadership Effectiveness and Group Performance, 2 cr.

Second Year, Fall Semester
CT 227, Mechanical & Electrical Systems, 4 cr.
CT 230, Statics and Materials, 4 cr.
CT 247, Construction Contracting, 4 cr.
CT 297, Work Experience, 0 cr.
COM 209, Expository Writing and Reading, 4 cr.

Second Year, Spring Semester
CT 234, Soils and Foundations, 4 cr.
SSI 202, Social Issues, 4 cr.
AM 275, Building Science/Residential Construction, 4 cr.
**Technical Elective, 4 cr.

Total: 65 credits

Surveying and Mapping
As land values increase and the need to use our natural resources efficiently while protecting our environment becomes more critical, the role of surveyors is expanding. The Surveying and Mapping specialization contains a core sequence of six courses (from Introductory Surveying to the Legal Aspects of Surveying) that continuously challenge students to improve their technical knowledge, computer skills, and field com-
petency. Using electronic field measuring equipment, computers to create and plot maps, and satellite positioning technology, the surveyors and mappers of today are at the forefront of acquiring, analyzing, and managing land information.

Career Opportunities: Licensed land surveyor, DOT engineering technician, GIS technician, land development planner, construction surveyor, GPS technician.

Surveying and Mapping Program of Study
First Year, Fall Semester
CT 220, Professional Practice, 1 cr.
CT 222, Computer Aided Design Level I, 4 cr.
CT 223, Introduction to Surveying and Mapping, 3 cr.
CT 224, Surveying and Mapping Lab, 2 cr.
AM 280, Technical Computer Literacy/Internet Applications, 4 cr.
MATH 203, Algebra and Trigonometry, 3 cr.

First Year, Spring Semester
CT 231, Design I, 4 cr.
CT 233, Construction Surveying, 4 cr.
CT 237, Land Design and Regulations, 4 cr.
COM 212, Technical Writing, 2 cr.
or COM 210, Public Speaking, 2 cr.
SSCI 204, Leadership Effectiveness and Group Performance, 2 cr.

Second Year, Fall Semester
CT 240, Legal Aspects of Surveying, 3 cr. and CT 243, Advanced Surveying and Mapping, 3 cr.
CT 247, Construction Contracting, 4 cr.
CT 297, Work Experience, 0 cr.
COM 209, Expository Writing and Reading, 4 cr.
Elective, 4 cr.

Second Year, Spring Semester
CT 244, Advanced Surveying Computations, 4 cr.
SSCI 202, Social Issues, 4 cr.
**Technical Elective, 4 cr.
Elective, 4 cr.

Total: 67 credits

Elective Courses
AM 261, Internal Combustion Engines I
AM 275, Building Science/Residential Construction
CT 227, Mechanical and Electrical Systems
CT 230, Statics and Materials
CT 233, Construction Surveying
CT 234, Soils and Foundations
CT 237, Land Design and Regulations.
CT 240, Legal Aspects of Surveying
CT 243, Advanced Surveying and Mapping
CT 244, Advanced Surveying Computations
CT 281, Architecture I History & Design
CT 282, Architecture II (Prereq: Architecture I)

Admissions Requirement
Applicants to the architectural technology, construction management, and surveying and mapping specializations must present at least two years of satisfactory work in college preparatory mathematics.

Community Leadership (CSL)
(formerly Community Service and Leadership)
www.unh.edu/tsas/academics/csl/
(For course descriptions, see page 254.)
The Community Leadership program (CSL) prepares students for influential roles within community organizations by combining hands-on community outreach with an academic study of communities, leadership, citizen influence, nonprofit organization management, and general education.

Students participate in faculty-supervised community outreach in a wide variety of locations including schools and other learning-focused agencies, crisis shelters, environmental organizations, animal care facilities, nursing homes, advocacy programs, town offices, citizen groups and other community-related organizations.

Through their coursework, community placements, and individualized plans of study, students learn how to: supervise volunteers, facilitate effective meetings, speak comfortably and knowledgeably to groups of various sizes, analyze community issues and their causes, manage financial information, organize projects and events, research and prepare grant proposals, create effective newsletters, influence public opinion, and organize people to work toward positive solutions for shared problems.

The Community Leadership program is designed to flexibly and effectively meet the needs of a diverse group of students including recent high school graduates as well as experienced community-service workers.

Curriculum Fee
Community Leadership $54*

Community Leadership Program of Study
First Year, Fall Semester
COM 209, Expository Writing and Reading, 4 cr.
SSCI 201, Human Relations, 4 cr.
CT 201, Introduction to Community Service and Leadership, 4 cr.
CT 200, Technology for Community Service and Leadership, 2 cr.
MTH, Mathematics, 3 cr.

First Year, Spring Semester
SSCI 202, Social Issues, 4 cr., or equivalent course determined in consultation with adviser
COM 210, Public Speaking, 2 cr.
CT 205, Communication within Communities 4 cr.
CT 202, Introduction to Nonprofit Organizations, 4 cr.
CT 203, Organizing and Supervising Volunteers, 4 cr.

Second Year, Fall Semester
CT 207, Introduction to Nonprofit Budgeting and Accounting Practices, 3 cr.
ABM 215, Business and Community, 4 cr., or CD 415 Community Development, 4 cr.
CT 204, Managing Change and Conflict in Communities, 4 cr.
COM 211, Critical Reading, 2 cr.
CSSL 290, Civic and Community Internship, 2-4 cr., or Electives, 2-4 cr.

Documented participation in one of the UNH Leadership Centers Programs

Second Year, Second Semester
CT 206, Literature of Family and Community, 4 cr.
CT 208, Essentials of Fund Raising for Community-Based Organizations, 2 cr.
CT 209, Essentials of Grant Writing for Community-Based Organizations, 2 cr.
CT 210, Community Service and Leadership Capstone Seminar, 4 cr.
Elective, 4 cr.

Total: 64-68 credits

**Technical Elective Courses: CT 235, Introduction to Information Technology; AM 251, Welding and Fabrication Technology; AM 262, Internal Combustion Engines II (Prereq. AM 261); other courses by approval.

*This one-time, nonrefundable curriculum fee is required to cover lab materials, specialized equipment maintenance, and transportation that is unique to the applied nature of the specialization. The curriculum fee covers the entire two-year course of study for one specialization. Any non-TSAS student may be assessed specific course fees, details of which are included in each semester’s Time and Room Schedule. All fees are subject to change.
Food Services Management (FSM)
(For course descriptions, see page 254.)
The Food Services Management program has two distinct specializations: dietetic technician and restaurant management.

Curriculum Fee
Food Services Management:
Dietetic technician $437*
Restaurant manager $437*

Dietetic Technician
www.unh.edu/tsas/academics/dietetic/
Students who complete the dietetic technician specialization are prepared for a variety of positions in the food, fitness, and healthcare industries. In a program that combines classroom work and practical experience, students learn such skills as evaluating the nutritional status of clients, developing nutrition care plans, and providing nutrition education. They also develop skills in the management of food production and delivery systems. Students participate in supervised practice rotations in the areas of medical food service management, clinical nutrition, and community nutrition for a total of at least 450 hours. These experiences take place in local health-care settings and community nutrition programs.

The specialization is accredited by the Commission on Accreditation of Dietetics Education (CADE) of the American Dietetic Association. Students who successfully complete the program of study are eligible to sit for the Dietetic Technician Registration Exam. A Dietetic Technician Registered is eligible for membership in the American Dietetic Association, an organization of nutrition professionals.

Career Opportunities: Dietetic technician, Registered DTR; clinical-hospitals, healthcare facilities, retirement centers; wellness-health clubs, weight clinics, wellness centers; community-community nutrition programs, public health agencies, WIC agencies; business-food companies, food vendors, distributors; food services management-schools, daycare centers, restaurants.

Restaurant Management Program of Study
First Year, Fall Semester
FSM 201, Food Preparation Fundamentals, 3 cr.
FSM 205, Hospitality Computer Applications, 3 cr.
FSM 228/229, Applied Nutrition for Dietetic Technicians, 4 cr.
COM 209, Expository Reading and Writing, 4 cr.
MTH 201, Math, 3 cr.

First Year, Spring Semester
FSM 200, Introductory Chemistry, 3 cr.
FSM 207, Hospitality: Sanitation and Safety, 2 cr.
NUTR 476, Nutritional Assessment, 4 cr.
NUTR 564, Managerial Skills in Dietetics, 3 cr.
ZOO 401, Human Biology, 4 cr.

Second Year, Fall Semester
FSM 275, Diet Therapy, 3 cr.
FSM 290, Managemntal and Clinical Dietetics Practicum, 7 cr.
NUTR 510, Nutrition Education and Counseling, 4 cr.

Second Year, Spring Semester
FSM 260, Community Nutrition Practicum, 5 cr.
FSM 265 Community Nutrition for Dietetic Technicians, 2 cr.
FSM 295, Dietetic Seminar, 1 cr.
COM 210, Public Speaking, 2 cr.
SSI 201, Human Relations, 4 cr.
SSI 204, Leadership Effectiveness and Group Performance, 2 cr.

Total: 64 credits

Restaurant Management
www.unh.edu/tsas/academics/restaurant/
In the Restaurant Management specialization, students experience a carefully developed combination of classroom and laboratory work. They engage in practical, hands-on experiences, using modern commercial equipment to help them refine the necessary skills to be successful in the field. Students operate two restaurants located in the Thompson School: Stacey’s Buffet, and the Balcony Bistro, an upscale gourmet dining establishment. They present weekly buffets, and cater banquets and special events sponsored by the School. Finally, a required summer internship rounds out the program’s hands-on experiential learning. Students can also work at the UNH Dairy Bar (which is operated by the FSM program), the New England Center, and University Hospitality Services, all located on the UNH campus. Extracurricular learning and earning opportunities are available in the many restaurants located in the Seacoast area. Students who want to continue their education are strongly encouraged to take electives from the University’s four-year program to get a head start on transfer status.

Career Opportunities: Restaurant owner/manager, caterer, food and beverage sales, food buyer, food and beverage manager, food services director.

Forest Technology (FORT)
www.unh.edu/tsas/academics/forest-tech/
(For course descriptions, see page 256.)
Students in the Forest Technology program are uniquely prepared for careers in the forest industries and natural resource management in New Hampshire and New England. Classroom lecture is backed up by practical field work in each of the subject areas. The curriculum is recognized by the Society of American Foresters and reviewed by an advisory committee representing the full spectrum of forestry organizations in the region. There is strong emphasis on leadership, safety, communication skills, accuracy of field work, data collection, and professional presentation. Unique facilities for teaching and learning include centrally located classroom and shop facilities, 3,000+ acres of University-owned forest land, a
sawmill, logging equipment, technologically advanced navigation, data collection and analysis equipment, and a faculty dedicated to teaching with vast field experience in the subject areas.

**Admissions Requirement**
Applicants to the Forest Technology specialization must present at least two years of satisfactory work in college preparatory mathematics.

**Curriculum Fee**
Forest Technology, specialization, $538*

**Forest Technician**
Forest technicians help plan, direct, and operate forestry enterprises. Students in the forest technician specialization experience a breadth and depth of instruction. They are exposed to the theory and practice of planting, thinning, and other silvicultural operations, including harvesting supervision. They learn how to design, lay out, and construct roads and trails; how to map and survey property; and how to manage woodlands to improve timber quality, wildlife habitat and conserve soil, water, and other natural resources. Graduates work in the wood products-related industries, in public forestland management agencies, with forestry consulting firms or urban tree care companies, and with a range of conservation organizations. Graduates can become licensed in N.H. to practice forestry on private lands.

**Career Opportunities:** Forestry consultant, fire control technician, mapping technician, GIS/GPS technician, timber and log buyer, log scaler, lumber grader, sawmill technician, arborist, urban tree care specialist, timber cruiser/forest inventory technician, forestry equipment/products sales.

**Forest Technician Program of Study**

**First Year, Fall Semester**
- FORT 269, Wildlife Ecology and Conservation, 3 cr.
- FORT 272, Mensuration, 4 cr.
- FORT 277, Logging, 4 cr.
- FORT 297, Forestry Work Experience, 0 cr.
- COM 210, Public Speaking, 2 cr.
or COM 211, Critical Reading, 2 cr.
or COM 212, Technical Writing, 2 cr.
- SSCI 204, Group Process and Leadership Development, 2 cr.
- Electives 2-4 cr.

**Second Year, Fall Semester**
- FORT 273, Management Operations and Analysis, 3 cr.
- FORT 274, Industrial Forest Management Tour, 2 cr.
- FORT 276, Forest Products, 4 cr.
- FORT 278, Forest Insects and Diseases, 2 cr.
- FORT 279, Forest Fire Control and Use, 2 cr.
- Electives 2-4 cr.

**Total: 65-69 credits**

**Horticultural Technology (HT)**
www.unh.edu/tsas/academics/horticulture/  
(For course descriptions, see page 256.)

Horticultural Technology students study the art and science of applied plant biology, preparing for environmentally attuned careers in the Green Industry. Rigorous first-year foundation courses in plant materials, plant growth and development, and soils support second-year specializations in ornamental horticulture, landscape operations. Employment opportunities in these areas continue to be excellent. Graduates enter a rapidly expanding job market in greenhouse production, floral design, nursery and garden center management, parks and grounds management, fruit and vegetable production, and landscape design, construction, and maintenance. Many recent graduates have established their own horticulture enterprises, and others continue their education toward a four-year degree in areas such as environmental horticulture, floriculture/greenhouse management, or business management.

**Curriculum Fee**
Horticultural technology: Both specializations $620*

*This one-time, nonrefundable curriculum fee is required to cover lab materials, specialized equipment maintenance, and transportation that is unique to the applied nature of the specialization. The curriculum fee covers the entire two-year course of study for one specialization. Any non-TSAS student may be assessed specific course fees, details of which are included in each semester’s **Time and Room Schedule**. All fees are subject to change.

**Ornamental Horticulture Program of Study**

Students who prefer to be generalists in horticultural technology may opt for the ornamental horticulture specialization. Students gain the broadest possible background in horticultural technology, a background attractive to employers in all specialty areas. Working closely with a faculty adviser, each student designs his or her own program, taking courses in the curriculum that fulfill the student’s particular needs. They first complete core requirements in the fundamentals of plant growth and development, soils, plant propagation, plant identification, and plant health care. Students may then choose elective coursework combining studies in floriculture, fruit and vegetable production, garden center management, and/or floral design.

**Career Opportunities:** Business owner/manager of garden center, nursery, flower shop, or fruit and vegetable business; greenhouse nursery, or fruit and vegetable production; floral designer.
Landscape Operations

Landscape horticulture has been projected to be one of the fastest growing service industries of the coming decade. It is a field that also offers unparalleled aesthetic satisfaction and meaningful reward. To succeed in landscaping increasingly requires a degree of technical and scientific expertise, as well as creativity, artistry, and problem-solving skills. Students in the landscape operations specialization gain a solid foundation in general horticulture and a thorough introduction to the landscape industry. In their classes, students meld theory and practice, and they apply what they learn in weekly lab periods and on-site visits to area operations. Many graduates eventually start their own landscape companies, and others continue their education toward a four-year degree in areas such as landscape architecture, parks and recreation, plant and soil science, environmental science, or business management.

Career Opportunities: Landscape design, landscape construction, garden centers, nurseries, golf courses, schools and parks, private and public grounds maintenance/management.

Landscape Operations Program of Study

First Year, Fall Semester
HT 201, Freshman Seminar, 1 cr.
HT 205, Plants, People and Place, 2 cr.
HT 207, Plant Structure and Function, 4 cr.
HT 215, Soils and Land Use (Half-term I), 2 cr.
HT 219, Computers in Horticulture, 1 cr.
COM 209, Expository Writing and Reading, 4 cr.
SSCI 203, Environmental Issues and Society, 2 cr.

First Year, Spring Semester
HT 217, Soils and Plant Nutrition (Half-term II), 2 cr.
HT 234, Pest Management, 4 cr.
HT 256, Horticultural Pruning, 2 cr.
MTH, Mathematics course, 3 cr.
SSCI 201, Human Relations, 4 cr.
or SSCI 202, Social Issues, 4 cr.
Electives, 1-5 cr.

Second Year, Fall Semester
HT 251, Introduction to Design Communication, 2 cr.
HT 257, Woody Landscape Plants, 3 cr.
HT 260, Grounds Management, 2 cr.
HT 263, Landscape Construction, 4 cr.
HT 297, Horticultural Work Experience, 2 cr.
COM 210, Public Speaking, 2 cr.
or COM 211, Critical Reading, 2 cr.
or COM 212, Technical Writing, 2 cr.
Approved Electives 1-5 cr.

Second Year, Spring Semester
HT 258, Herbaceous Ornamental Plants, 2 cr.
HT 270, Grounds Management (Half-term II), 2cr.
HT 272, Landscape Design Studio, 4 cr.
HT 288, Horticultural Business Management, 4 cr.
HT Electives 4-8 cr.

Total: 66-72 credits
The University of New Hampshire at Manchester was established in 1985 as the University's sixth college to provide access to UNH associate, bachelor, and graduate degree programs for people who live and work in central New Hampshire. The college combines the tradition of liberal arts and professional degree programs in a rich, urban learning environment with a focus on excellence in teaching and opportunity. UNH Manchester is centrally located in Manchester's historic mill yard where it has served as a catalyst for the revitalization of the city’s downtown area and symbolizes the region's growth and diversity.

UNH Manchester Degree Programs

(For a complete listing of programs and courses, go to www.unhm.edu/catalog/courses.html.)

UNH Manchester offers University of New Hampshire bachelor of arts and science degree programs in the humanities and social sciences, and technology. Each year more than 1600 students who live and work in the Merrimack Valley region choose UNH Manchester for its range of educational resources and positive learning environment. The UNH Center for Graduate & Professional Studies is located at the UNH Manchester campus and offers UNH graduate degree and professional programs to working professionals in the region.

UNH Manchester’s small classes encourage interaction between faculty and students and support educational excellence. Students find a convenient, affordable university education designed to meet the unique requirements of commuting students. The University Center, located in Manchester’s historic mill yard at 400 Commercial Street, is convenient and easily accessible by major highways and city bus service.

Undergraduate degree students in Manchester earn the same UNH degree as their peers on the Durham campus. Students are required to satisfy University admission and graduation requirements, which include completion of at least 128 credits, a 2.00 minimum cumulative grade-point average, general education requirements, and, for the bachelor of arts degree, a foreign language requirement. The foreign language is not required in the bachelor of science programs.

Students may also pursue UNH associate in arts or associate in science degree programs full or part time with a choice of concentrations. Requirements for the associate degrees include completion of 64 credits, a 2.00 minimum grade-point average, and an interdisciplinary core course. Those students who complete the last 16 credits of the associate degree with a grade-point average of at least 2.50, earn a cumulative associate degree grade-point average of 2.50 or higher, and are recommended by their academic advisers are guaranteed admission to a baccalaureate program at the University in either Durham or Manchester. The University does not, however, guarantee admission to a specific college or program.

Selected graduate degrees from UNH are also available through the University of New Hampshire at Manchester.

Minors

The following academic minors are available at UNH Manchester for enrolled baccalaureate candidates. Further information may be obtained from the Academic Counseling Office, (603) 641-4170.

American Sign Language and Deaf Studies
Art
Business (pending approval)
Computer Information Systems
Education
English
History
Humanities
Illumination Engineering
Philosophy
Political Economy
Political Science
Psychology
Sociology
Women’s Studies

Pre-Majors

Students entering the associate in arts program in general studies may prepare for transfer admission to many baccalaureate degree programs available through the University’s Manchester and Durham campuses. By working closely with an academic adviser, general studies students can select
structured course plans or pre-majors that are compatible with almost every baccalaureate major.

Certificate Programs for Professional Advancement
UNH Manchester's credit certificate programs are designed for individuals who want to enhance their credentials for a new position or to take the first step toward a college degree. The programs also meet the needs of working professionals with postsecondary degrees who need to expand their knowledge or update their skills.

Each program provides a concentrated learning experience in a specific subject area designed for students with varied educational backgrounds and experience. Students must complete four required courses at UNH Manchester in their chosen program to earn a certificate. The college's accessible course schedules allow students to attend day or evening classes, full or part time.

Communication Skills for Managers (4 courses, 16 credits)
The fundamentals of oral and written communications are presented in this certificate program. Critical thinking is emphasized. Students learn to read, write, and speak more effectively both personally and professionally.

Business and Accounting Skills for Managers (4 courses, 16 credits)
Students gain a basic understanding of American businesses and how they work. A general overview of the functional areas in business as well as fundamental concepts of accounting, finance, and the use of computers to manage information is presented in the coursework.

Human Behavior Studies (4 courses, 16 credits)
An understanding of psychological, cultural, and social aspects of human behavior is developed in this program. The coursework explores how culture and intellect influence behavior and communication with others.

College Transition Program
The University of New Hampshire at Manchester's College Transition Program (CTP) enables students to begin their University studies as candidates for the associate in arts degree while receiving an intensive yearlong (two semesters) plan of academic support and study skill enhancement.

Students are identified as CTP eligible during the standard admission application review process. CTP students are required to supplement their academic schedules with noncredit coursework to strengthen study skills.

Attendance at the New Student Orientation, mandatory testing and placement, and enrollment in the CTP support services and course work are required for all CTP students. After orientation, CTP students work closely with academic advisers to design appropriate course plans, establish performance goals, determine which learning support services are required, and monitor academic achievement.

Students who successfully complete two semesters of CTP may continue on to earn their associate degree through either full-time or part-time study.

Application Deadlines
The UNH Manchester application deadline for the fall semester is June 15 and for the spring semester is November 1. For priority consideration for financial aid, the application deadline is March 1 for the following academic year.

For More Information
The UNH Manchester catalog is available online at unhm.unh.edu/catalog/catalog.pdf. To request a catalog or more specific information on UNH Manchester courses and degree programs, contact the Office of Admissions, University of New Hampshire at Manchester, University Center, 400 Commercial Street, Manchester, NH 03101, or e-mail UNHM.admissions@unh.edu, phone (603) 641-4150; fax (603) 641-4125; TTY/TTD (603) 641-4308.

Associate Degree Programs

General Studies
The Associate of Arts in General Studies offers students academic flexibility in a program that combines the foundations of a liberal education and elective courses that satisfy personal interests. The AA in General Studies is the first two years of a baccalaureate program and all 400-level courses transfer to and fulfill the University's general education requirements. Students who earn an AA in General Studies have a foundation for continued study in any major while they develop problem-solving ability, cognitive skills, and learning techniques that are vital to a life-time of learning. Many students begin their college study in the AA General Studies program. Depending on personal interests and academic goals, students may choose to apply to a baccalaureate degree program prior to completion of the AA degree.

To graduate with an Associate of Arts Degree in General Studies, students must complete 64 credits and fulfill two types of requirements: University (general education) and degree requirements and earn a minimum cumulative GPA of 2.0. The program includes 9 courses from the general education curriculum. Working with their advisers, students enhance their program of study with elective courses where they can explore their interests and possible baccalaureate degree majors. The last 16 hours of credit must be UNH courses completed following admission and matriculation, unless permission is granted to transfer part of this work from another institution.

The AA General Studies program includes the following course requirements:
Two writing-intensive courses, one of which must be ENGL 401, First-Year Writing
One course in quantitative reasoning
Two courses in biological sciences, physical sciences or technology
One course in historical perspectives
One course in foreign culture or fine arts
One course in social science
One course in works of philosophy, literature, and ideas
Completion of interdisciplinary core course, Humanities I or Humanities II
Elective courses

For more information about the AA in General Studies, please contact the UNH Manchester Office of Admissions at (603) 641-4150 or e-mail unhm.admissions@unh.edu.

Associate in Science Degree Programs

Biological Sciences
Biology is the study of living organisms in both laboratory and field conditions. It concerns itself with questions of understanding the living world, its complex interrelationships, and the role of human beings within it.

The biological sciences program at UNH Manchester is designed to serve either as a terminal degree or as a springboard for students interested in the life sciences which include majors in biology, microbiology, zoology, plant biology, wildlife management,
environmental conservation, biochemistry and animal sciences. Employment opportunities in the public and private sectors include education, food, water, wastewater and other industrial laboratories, clinical laboratories, biotechnology, environmental research and monitoring, and animal behavior.

Students must complete a minimum of 68 credits to graduate. There are 7 tracks in the A.S. degree program at UNH Manchester: biology and microbiology.

**Biology Track Requirements**

- Math 425, Calculus I
- PSYC 402, Statistics in Psychology (BIO 528, Applied Biostatistics, offered on the Durham campus, may be substituted)
- BIOL 413, Principles of Biology I
- BIOL 414, Principles of Biology II
- CHEM 403, General Chemistry I
- CHEM 404, General Chemistry II
- MICR 503, General Microbiology
- CHEM 545/546, Organic Chemistry and Organic Chemistry Laboratory
- BCHM 658/659, General Biochemistry and General Biochemistry Laboratory
- BIOL 541, General Ecology
- BIOL 604, Principles of Genetics

**Microbiology Track Requirements**

Students opting for the microbiology track must take all courses listed in the biology program with the exception of BIOL 541 General Ecology. Two additional courses MICR 504 Brewing and Industrial Microbiology, and MICRO 603 Bacteriology of Food are required of students in the microbiology track.

Note: Pre-medical and pre-dental students should enroll in CHEM 651-652 and 653-654 at Durham. These courses may substitute for CHEM 545/546 and BCHM 658-659. In addition they should also enroll in MATH 426.

For more information about the biological sciences program, contact Professor Stephen Pugh, program coordinator, (603) 641-4128, e-mail sfp@cisunix.unh.edu. Or contact the UNH Manchester Office of Admissions at (603) 641-4150 or e-mail unhm.admissions@unh.edu.

**Business Administration**

The Associate of Science degree program in Business Administration prepares students for admission to a baccalaureate program in business or for the first step to a managerial or administrative career. The program builds on the University's General Education program with required and elective courses in the business administration major and utilizes the resources of Manchester's business community and its economic strengths. Students develop an understanding of accounting, economics and computer applications and learn about the legal aspects of business, interpersonal communication, business statistics and technology through the elective courses.

**Associate Degree in Business Administration Program of Study**

Students must complete a minimum of 68 credits to graduate with an Associate of Science degree in Business Administration. A minimum cumulative GPA of 2.0 is required for graduation. In addition to completing 10 general education courses, students must complete 7 courses (28 credits) in major.

**Required Courses**

- ADM 400, Introduction to Business
- CIS 411, Introduction to Computer Applications
- ECN 412, Introduction to Microeconomics
- ADM 532, Introduction to Financial Accounting
- ADM 533, Introduction to Managerial Accounting

**Business Administration Electives**

(Choose two of the following courses. Students may select electives from 600-level ECN or ADM courses with adviser permission.)*

- ADM 430, Introduction to Business Statistics
- CIS 510, Computer Information Systems
- CIS 515, Multimedia: Introduction & Applications
- CIS 520, Database Management Concepts
- CIS 542, Operating System Applications
- CMN 457, Introduction to Interpersonal Communication
- CA 450, Public Speaking
- ECN 411, Introduction to Macroeconomic Principles
- ECN 625, The Regulation of Business
- ECN 635, Money, Banking and Macroeconomic Activity
- ECN 640, Business Law and Economics
- ECN 650, Economics for Managers
- Other 600-level ECN or ADM courses by permission

*Students planning to pursue the BA in Business should select ADM 430, Introduction to Business Statistics, and ECN 411, Introduction to Macroeconomic Principles.

For more information about the A.S. Business Administration Program, contact Tom Birch, Ph.D., program coordinator, at (603) 641-4108 or e-mail tbirch@cisunix.unh.edu; or contact the Office of Admissions at (603) 641-4150, e-mail unhm.admissions@unh.edu.

**Bachelor's Degree Programs**

**Bachelor of Arts in Business (B.A.)**

(For course descriptions, see page 259 and 263.)

The Bachelor of Arts in Business has a strong interdisciplinary focus. The curriculum adheres to a philosophy that effective decision-making requires a broad understanding of institutional and cultural climate within which businesses are operating. The program utilizes the resources of Manchester's business community and its economic strengths. During the first two years of study, students take introductory classes in business administration, economics, accounting, business statistics, and information systems along with elective and general education classes. The intermediate business core includes required courses in marketing, organizational behavior and financial or operations management. Additionally, students choose an option of focused study either in Business Economics and Political Economy, Business and Technology, or General Business Administration. For students with a unique interest, the opportunity also exists to create a Self-Designed concentration with approval of his/her adviser and the Coordinator of the Business program.

A culminating capstone experience enables students to apply their knowledge in the form of an internship, applied senior project, or special topics seminar. Because this is a Bachelor of Arts program, students fulfill the foreign language requirement.

For more information about the B.A. Business Administration Program contact Jack McCarthy, D.B.A., program coordinator, at (603) 641-4186, by e-mail to jack.mccarthy@unh.edu; or contact the Office of Admissions at (603) 641-4150, unhm.admissions@unh.edu.

**Business Program of Study**

Students must complete 128 credits to graduate. Each required course must be completed with a minimum grade of C-. Students must attain a minimum GPA of 2.0 in major courses required for graduation. Majors cannot use ADM 430, ECN 411, or ECN 412 to satisfy both General Education and major requirements. Transfer students must complete at least half of their credits in the major and the eight-credit capstone experience in residence at UNH Manchester.
Business Core Courses (8 courses)
ADM 400, Introduction to Business
ECN 411, Introduction to Macroeconomic Principles
ECN 412, Introduction to Microeconomic Principles
CIS 411, Introduction to Computer Applications or
ADM 403, Computer Essentials
CIS 510, Computer Information Systems
ADM 430, Business Statistics
ADM 532, Financial Accounting
ADM 533, Managerial Accounting

Intermediate Business Core (3 courses)
ADM 610, Marketing Principles and Applications
ADM 620, Organizational Behavior
ADM 601, Financial Management or
ADM 650, Operations Management

Business Field Concentrations (4 courses)
Business Economics and Political Economy
4 courses from the following (including at least one course at 600-level or above):
POLT 401, Politics and Society
POLT 403, United States in World Affairs
POLT 560, World Politics
ECN 640, Business Law and Economics
ECN 625, Regulation of Business
ECN 635, Money, Banking and Macroeconomic Activity
ECN 650, Economics for Managers
ECN 670, Public Sector Economics
HUMA 412, Industry and Welfare
HUMA 660, The Moral Dimensions of Economic Life
POLT 595, 596 Explorations in Politics
POLT 762, International Political Economy
ADM 695, Independent Study

Business and Technology
4 courses from the following:
CS 403, Online Network Exploration
CIS 425, Introduction to Computer Programming
CIS 515, Multimedia: Introduction and Applications
CIS 520, Database Management Concepts
CIS 550, Networking Concepts
CIS 610, Systems Analysis & Design

General Business Administration
4 courses from the following (but including no more than 2 ECN courses):
ADM 601, Financial Management or
ADM 650, Operations Management
ADM 675, Special Topics in Business Administration
ADM 685, Special Topics in Business Administration
ADM 695, Independent Study
ECN 640, Business Law and Economics
ECN 625, Regulation of Business
ECN 635, Money, Banking and Macroeconomic Activity
ECN 650, Economics for Managers
UMST 500, Internship

Self Designed Concentration
4 courses (or 16 credit hours) with faculty approval, including at least one course at 500-level or above.

Business Capstone Experience (2 courses)
ADM 701, Business, Government and Society
ADM 750, Business Internship Seminar or
ADM 760, Applied Senior Project or
ADM 770, Special Topics Senior Seminar
Note: Because this is a Bachelor of Arts program, students must fulfill a language requirement. Efforts will be made to enhance fluency through subsequent courses and community experiences.

Communication Arts (B.A.)
(For course descriptions, see page 260.)
Students majoring in Communication Arts explore the how and why of the ways we communicate through our words, actions, and technologies. The program examines a variety of communication practices—moving image media, news, and personal relationships—as these are applied and developed across a range of social, cultural, professional, organizational, and historical contexts. In addition to classroom instruction, the program provides students with opportunities for fieldwork (including internships and service learning initiatives) that connect them to the urban community and integrate their education within “real life” communication settings.

Communication Arts prepares students for many careers and postgraduate options, including advanced graduate study. Students emerge from the program with a rare combination of hands-on and theoretical knowledge that is attractive to employers from industries and professions such as film, radio, television, journalism, public relations, sales, advertising, counseling, conflict mediation, and others. The Communication Arts degree also translates well to related work in government, social service, and community affairs. Employers in the general business community seeking well-rounded, liberal arts graduates who can communicate effectively in a variety of mediums also find our graduates highly desirable. Further, through internships students have the opportunity to learn more about their chosen fields and better prepare themselves for the transition to professional life.

Beyond the academic and professional rewards, study in Communication Arts enhances the meaning and richness of our everyday lives by enabling us to better see and understand the intricate ways in which communication binds people together.

For more information, contact Barbara Jago, Ph.D., program director, at (603) 641-4106 or e-mail bjago@comcast.net. Visit the Communication Arts Web page at www.unhm.unh.edu/programs/ca, or contact the Office of Admissions at (603) 641-4150.

Degree Requirements
Communication Arts majors must complete 10 courses (40 credits) and maintain an overall grade point average in the major of 2.0 or better. Transfer students must complete at least 20 credits in the CA major at UNH Manchester. CMN 455, 456, and 457 may not be used to satisfy general education requirements for CA majors. Information on prerequisites for CA courses can be found in the course descriptions at the back of this catalogue. CA majors considering taking CIS 515, HIST 690, HUMA 796, or PSYC 762 must meet the necessary prerequisites for each course and should consult with their faculty adviser before registering. Degree requirements for the major are presented below.

I. Required Core Courses—12 credits (3 courses)
Students must earn a “C” or better in each course if it is to count toward either the UNH Manchester Communication Arts major or the UNH Durham Communication major.

CMN 455, Introduction to Mass Communication
CMN 456, Propaganda and Persuasion
CMN 457, Introduction to Interpersonal Communication

II. Selected Coursework—28 credits (3 courses from area A, 2 from area B, 2 from area C)
Students must earn a “C-” or better in each selected course to satisfy CA requirements.

CA 450, Introduction to Public Speaking
CA 501, Internship: Communication in the Urban Community
CA 502, Image and Sound
CA 503, Techniques for News Reporting
CA 504, Film Criticism
CA 506, Gender
CA 508, Conflict in Relational Communication
CA 510, Language and Interaction
CA 512, Scriptwriting
CA 513, Radio News Production
CA 514, Fundamentals of Video Production
CA 515, Advanced Video Production
CA 516, Speechwriting
CA 520, Special Topics in Applied Communication
CIS 515, Multimedia: Introduction and Applications
HIST 690, Public History
PSYC 762, Counseling

CA 525, Media Programming
CA 526, Organization of Newswork
CA 527, History of Film
CA 528, Media Policy and Law
CA 530, Celluloid Relationships
CA 531, History and Organization of Advertising
CA 535, Marital Communication
CA 539, Communicating in Families

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CA 550, Special Topics in Communication Organization, History, and Policy
HUMA 640, Birth of Rock and Roll

C. Communication Practices: Theory and Research (8 credits).
Any 2 courses.
CA 600, Research Methods: Media
CA 601, Exploring Relationships
CA 610, Communication Technologies and Culture
CA 611, Theories of Relational Communication
CA 612, Narrative
CA 615, Film History: Theory and Method
CA 618, Documentary
CA 720, Seminar in Communication Arts
CA 795, Independent Study

The core requirements for Communication Arts are identical to those for Communication, therefore credit for CMN 455, CMN 456, CMN 457 automatically transfers for students transferring from Manchester to Durham to major in Communication, as well as for students transferring from Durham to Manchester to major in Communication Arts. All other courses in Communication Arts have a CA designation. The transfer of these courses to satisfy degree requirements for the Communication major in Durham is determined on a course-by-course basis by Communication faculty. Likewise, the transfer of Communication courses (other than CMN 455, 456, 457) to satisfy degree requirements for the Communication Arts major in Manchester is determined on a course-by-course basis by Communication Arts faculty.

Suggested Concentrations in Communication Arts
Students are welcome to choose courses from across the Communication Arts curriculum, but those wishing to meet specific academic or professional goals may plan coursework using one of the concentrations suggested below. In addition, students may enhance their studies with activities beyond the classroom, including a wide range of internships available across the region. Communication Arts students may also participate in the University’s Web radio station, UNHFM.net, as well as in numerous area film festivals.

Concentration in Moving Image Media
CA 501, Internship
CA 502, Image and Sound
CA 504, Film Criticism
CA 512, Scriptwriting
CA 514, Fundamentals of Video Production
CA 515, Advanced Video Production
CA 525, Media Programming
CA 530, Celluloid Relationships
CA 600, Research Methods: Media

CA 610, Communication Technologies and Culture
CA 615, Film History: Theory and Method
CA 617, Aesthetic Theory in Moving Image Media
CA 618, Documentary

Concentration in News
CA 450, Introduction to Public Speaking
CA 501, Internship
CA 503, Techniques for News Reporting
CA 513, Radio News Production
CA 525, Media Programming
CA 526, Organization of Newswork
CA 528, Media Policy and Law
CA 600, Research Methods: Media
CA 610, Communication Technologies and Culture
CA 618, Documentary

Concentration in Relational Communication
CA 501, Internship
CA 506, Gender
CA 510, Language and Interaction
CA 530, Celluloid Relationships
CA 539, Communicating in Families
CA 550, Special Topics: Marital Communication
CA 601, Research Methods: Relational Communication
CA 661, Theories of Relational Communication
CA 612, Narrative
CA 720, Seminar in Communication Arts

Computer Information Systems (B.S.)
(For course descriptions, see page 262.)
The Bachelor of Science degree in Computer Information Systems (CIS) prepares graduates with skills to work in the highly integrated field of Information Systems. The program focuses on functional areas of information technology that are used to manage computers, communications, and information resources within an organization. Students will:
• Gain knowledge of computer information systems technology
• Collaborate with individuals and groups on design and implementation of application solutions
• Communicate effectively (written and oral) about deploying information technology
• Review and critically evaluate current trends in computer technology to select appropriate solutions for specific organizational goals
• Develop awareness of social and ethical issues in the computer profession.

Career opportunities for students with a CIS degree are varied, but may include such areas as database support, helpdesk manager, technical writer, PC Administration, Systems Analyst, Web development, network administration, and training. Career options exist in a wide range of organizations as all businesses continue to implement IT solutions.

The CIS program is based on three levels of technology courses, a self designed concentration, and the General Education requirements of the University. The CIS core courses prepare graduates with a broad foundation in Computer Information Systems. The self-design concentration prepares students to explore a specific area of CIS application.

Suggested areas include: business, education, writing, or communications. Students select a concentration in consultation with their advisor before their junior year.

Courses in Level One provide an understanding of the use of technology in organizations, develop competencies for personal productivity, and strengthen the student's ability to work in the information marketplace. Students select 3.

Level One
CIS 405, Introduction to the Internet and Web Authoring
CIS 411, Introduction to Computer Applications
CIS 425, Introduction to Computer Programming
CIS 515, Multimedia: Introduction and Applications.

Courses in Level Two build on the introductory experiences and expand functional competencies in CIS. Students select 4.

Level Two
CIS 510, Fundamentals of Computer Information Systems
CIS 520, Database Design and Development
CIS 542, Operating System Applications
CIS 550, Network Concepts
CIS 560, Computer Law and Ethics

Courses in Level Three focus on CIS development, implementation and project management. Students select 3.

Level Three
CIS 610, Systems Analysis and Design
CIS 620, Network Administration and Maintenance
CIS 630, Application Programming using Java
CIS 650, System Implementation with DBMS
CIS 680, Internship

Students complete 128 credits.
10 courses in the General Education program (40 credits)
13 courses in CIS (52 credits)
4 courses in a required self-designed concentration (16 credits)
5 free electives. (20 credits)

Required courses must be completed with a minimum grade of C.
Students must attain a minimum GPA of 2.0 in major courses required for graduation. Students must complete 24 credits of CIS courses in residence.
For additional information about the B.S. in Computer Information Systems, contact Karla Vogel, program coordinator, at (603) 641-4127, or by e-mail to karla.vogel@unh.edu; or contact the Office of Admissions at (603) 641-4150.

Engineering Technology (B.S.)
(For course descriptions, see page 263.)

Engineering technology requires the application of engineering and scientific knowledge and methods combined with technical skills in support of engineering activities. Graduates may work in a variety of areas including engineering design, manufacturing, field service, testing, and sales, and may work in management positions related to engineering, manufacturing, and computer technology.

The Engineering Technology Program at UNH Manchester offers only junior- and senior-level coursework. Students admitted to this program must have an appropriate associate degree from the New Hampshire Technical Institute or an equivalent institution accredited by the Technology Accreditation Commission of the Accreditation Board of Engineering Technology (TAC/ABET) or show academic evidence of ability to successfully complete the requirements of this calculus-based program.

The programs at UNH Manchester are designed to meet the needs of both full- and part-time students with a mix of classes scheduled during the day and in the evening.

Engineering Technology Program of Study

Students may major in electrical engineering technology, mechanical engineering technology, or computer technology. Regardless of the preferred academic specialization, all entering students should have completed a minimum of twelve semester hours of college level mathematics, including two semesters of calculus. Students without this background will be required to take either MATH 426 Calculus II, MATH 527 Differential Equations with Linear Algebra, or MATH 644 Statistics during the first semester of the junior year. The typical junior and senior year course selections follow.

Electrical Engineering Technology (EET)
ET 625, Technical Communications
ET 630, Analytical Methods in Technology
ET 671, Digital Systems
ET 674, Control Systems & Components
ET 677, Analog Systems
ET 733, Business Organization and Law
ET 680, Communications and Fields
ET 734, Economics of Bus. Activities
ET 762, Illumination Engineering
ET 763, Lighting Design & Application*
ET 788, Introduction to Digital Signal Processing
ET 790, Microcomputer Technology
ET 791, Electrical Engineering Technology Project
CS 410C, Introduction to Scientific Programming
General Education requirements (5)

Electrical engineering technology students must also complete a minimum of nine credit hours of courses in communication skills.

Mechanical Engineering Technology (MET)
ET 625, Technical Communications
ET 630, Analytical Methods in Technology
ET 639/640, HVAC 1 & 2
ET 641, Production Systems
ET 644, M.E. Concepts in Design and Analysis or ET 649, Production Tooling and Manufacturing Process
ET 674, Control Systems and Components
ET 675, Electrical Technology
ET 733, Business Organization & Law
ET 734, Economics of Business Activities
ET 745, Instrumentation or ET 762 Illumination Engineering
ET 763, Lighting Design & Application*
ET 751, Mechanical Engineering Technology Project
CS 410C, Introduction to Scientific Programming
General Education requirements (5)

Mechanical engineering technology students must satisfactorily complete CHEM 403, General Chemistry, or offer evidence of equivalent coursework. They must also complete a minimum of nine credit hours of courses in communication skills.

ET Computer Technology Option
ET 625, Technical Communications
ET 630, Analytical Methods in Technology
ET 601, Data Structure & Databases
ET 671, Digital Systems
ET 647, Adv. Perspectives on Prog.
ET 707, Object Oriented Design
ET 733, Business Organization and Law
ET 734, Economics of Bus. Activities
ET 790, Microcomputer Systems
ET 791, Electrical Engineering Technology Project Technical Electives
ET 627, Adv. Developmental Theory of E-commerce
ET 667, Graphics and Animation
ET 717, Network Security
ET 737, Web Server Databases
ET 747, User Interface Design
ET 777, Adv. Distributed Programming Trends
ET 787, Artificial Intelligence and Expert Systems
ET 790, Microcomputer Systems

*Optional technical elective taken by students in the Lighting minor.

For information about the engineering technology program, contact B.S. Engineering Technology Program Chair and Program Coordinator for the Electrical Engineering Technology (EET) and the EET Computer Technology Option Programs: Professor David A. Forest, (603) 641-4322 or by e-mail to daforest@cisunix.unh.edu or davidunh@comcast.net.

For information about the engineering technology program, contact Professor Ralph Draper, B.S., Mechanical Engineering Technology program coordinator, (603) 641-4323 or e-mail rwd@cisunix.unh.edu.

For admissions information, contact the Undergraduate Office of Admissions at (603) 641-4150, e-mail unh.m.admissions@unh.edu.

English (B.A.)
(For course descriptions, see page 264.)

Through the study of a wide variety of literary materials, English majors deepen their understanding of history, culture, language, and human behavior. They also gain skill in writing, reading, and critical thinking.

The faculty of the UNH Manchester English department specialize in Twentieth-century poetry, poetry writing, women's literary traditions, American literary folklore, New England culture, protest literature, nature writers, American and British fiction, Victorian literature and art, Renaissance drama, interdisciplinary studies, composition, journalism, grammar, and the use of computers to teach literature and writing.

Many upper-level courses are conducted as seminars, and individual conferences with professors are common. Field trips to see local performances of drama and poetry readings are often planned in conjunction with specific literature courses.

Job prospects for English majors after graduation are varied. English majors find employment in libraries and museums, government agencies, nonprofit organizations, publishing companies, journalism, the media, social work, banking, and many other fields.

English Program of Study

For the English major at UNH Manchester, students must complete a minimum of 40 credits in major coursework. Introduction to Critical Analysis (ENGL 419) must be completed with a grade of C or better. Except for ENGL 419, all courses must be completed with a grade of C- or above in order to count towards the English major. Major requirements include ENGL 419, two additional
The study of history may include all of human events. The conflicting evidence, to find cause and effect, is an essential element of the educated life. Relevant questions. Through careful observation and evaluation of information, they express themselves effectively, and to ask important questions. Through careful observation and evaluation of information, they seek explanations for human events. The study of history may include all of human culture and society and provides tremendous latitude in the subjects which may be studied. The interdisciplinary nature of the field makes it a natural focus for study which may encompass a variety of other fields.

Students majoring in history must complete ten 4-credit history courses or their equivalent with a grade of C- or better, and an overall average in these courses of 2.0 or better.

History majors are urged to complete HIST 500 in the semester following the major declaration and HIST 797 during the senior year. In addition, a major must take at least 8 courses of which a minimum of 3 must be at the 600-level or above. Only one 695/696 independent study course may be used to fulfill the 600 level requirement, and no more than 2 independent studies may be used toward the ten-course requirement. No more than two 400 level courses may be counted toward the major. The program must be planned in consultation with an adviser.

The distribution of required courses for the major is as follows:

- **HIST 500, Introduction to Historical Thinking**
- **Approved area of specialization**
  - 4 courses numbered 500 and above centered around a nation, region, time period or interdisciplinary theme. Two of these courses may be taken in another department with the approval of the student’s adviser.
- **Complimentary history courses at least three**
  - history courses from outside the area of specialization.
- **History elective may be a history course**
  - from the area of specialization or complementary area.
- **HIST 797, Colloquium in History**

A particular feature of the history program at UNH Manchester is the opportunity to do internships for academic credit. These internships, which enable students to work in museums, historical societies, government agencies, archives, and in other institutional settings, may be arranged with the help of the faculty.

A typical freshman program consists of ten 4-credit history courses or their equivalent with a grade of C- or better. In selecting these courses, students must meet the following distribution requirements:

- **ENGL 419, Introduction to Critical Analysis, or ENGL 529, Writing About Literature**
- **Literature before 1800**: Either two advanced courses (numbered 600 or above), or one advanced course and ENGL 513
- **Literature after 1800**: Either two advanced courses, or one advanced course and one course from the following list:
  - ENGL 514, 515, or 516

Total English courses must include three 500 level courses and seven courses numbered 600 and above.

A typical freshman program in the first semester consists of Freshman English and three general education requirements or electives.

In the second semester, the student typically would take Introduction to Critical Analysis, an introductory literature course, and two general education requirements or electives.

For more information about the English program, contact Fred Metting, Ph.D., program coordinator, (603) 641-4161 or e-mail fmb@cisunix.unh.edu. Or contact the UNH Manchester Office of Admissions at (603) 641-4150, e-mail unhm.admissions@unh.edu.

The study of history is an essential element of the liberal education. The history major provides both an awareness of the past, and the tools to evaluate and express one's knowledge. Study of the past gives meaning to the present. It increases our understanding of the political, social, economic, and cultural forces that influence our lives. It opens a collective memory to us—of our community, our nation, the Western world, and the human race itself.

The student who majors in history will have the opportunity to study the breadth of human experience and will acquire the skills in critical reading and writing which form the foundation of the educated life. Students of history learn to analyze conflicting evidence, to find cause and effect, to express themselves effectively, and to ask relevant questions. Through careful observation and evaluation of information, they seek explanations for human events. The study of history may include all of human culture and society and provides tremendous latitude in the subjects which may be studied. The interdisciplinary nature of the field makes it a natural focus for study which may encompass a variety of other fields.

Students majoring in history must complete ten 4-credit history courses or their equivalent with a grade of C- or better, and an overall average in these courses of 2.0 or better.

History majors are urged to complete HIST 500 in the semester following the major declaration and HIST 797 during the senior year. In addition, a major must take at least 8 courses of which a minimum of 3 must be at the 600-level or above. Only one 695/696 independent study course may be used to fulfill the 600 level requirement, and no more than 2 independent studies may be used toward the ten-course requirement. No more than two 400 level courses may be counted toward the major. The program must be planned in consultation with an adviser.

### History (B.A.)

*(For course descriptions, see page 266.)*

The study of history is an essential element of the liberal education. The history major provides both an awareness of the past, and the tools to evaluate and express one's knowledge. Study of the past gives meaning to the present. It increases our understanding of the political, social, economic, and cultural forces that influence our lives. It opens a collective memory to us—of our community, our nation, the Western world, and the human race itself.

The student who majors in history will have the opportunity to study the breadth of human experience and will acquire the skills in critical reading and writing which form the foundation of the educated life. Students of history learn to analyze conflicting evidence, to find cause and effect, to express themselves effectively, and to ask relevant questions. Through careful observation and evaluation of information, they seek explanations for human events. The study of history may include all of human culture and society and provides tremendous latitude in the subjects which may be studied. The interdisciplinary nature of the field makes it a natural focus for study which may encompass a variety of other fields.

Students majoring in history must complete ten 4-credit history courses or their equivalent with a grade of C- or better, and an overall average in these courses of 2.0 or better.

History majors are urged to complete HIST 500 in the semester following the major declaration and HIST 797 during the senior year. In addition, a major must take at least 8 courses of which a minimum of 3 must be at the 600-level or above. Only one 695/696 independent study course may be used to fulfill the 600 level requirement, and no more than 2 independent studies may be used toward the ten-course requirement. No more than two 400 level courses may be counted toward the major. The program must be planned in consultation with an adviser.

### The distribution of required courses for the major is as follows:

- **HIST 500, Introduction to Historical Thinking**
- **Approved area of specialization**
  - 4 courses numbered 500 and above centered around a nation, region, time period or interdisciplinary theme. Two of these courses may be taken in another department with the approval of the student’s adviser.
- **Complimentary history courses at least three**
  - history courses from outside the area of specialization.
- **History elective may be a history course**
  - from the area of specialization or complementary area.
- **HIST 797, Colloquium in History**

A particular feature of the history program at UNH Manchester is the opportunity to do internships for academic credit. These internships, which enable students to work in museums, historical societies, government agencies, archives, and in other institutional settings, may be arranged with the help of the faculty.

A typical freshman program consists of at least two history courses (Introduction to Historical Thinking, Western Civilization, Historical Survey of American Civilization); Freshman English; three to five general education requirements; and electives.

For more information about the history program, e-mail John Resch, Ph.D., program coordinator, at (603) 641-4134, or by e-mail jpr@cisunix.unh.edu. Contact the UNH Manchester Office of Admissions at (603) 641-4150, e-mail unhm.admissions@unh.edu.

### Humanities (B.A.)

*(For course descriptions, see page 266.)*

The UNH Manchester humanities program is an interdisciplinary study of the human condition, past and present. The program is based on careful examination of substantial works from a variety of disciplines and is intended to develop intellectual skills, specialized knowledge and a breadth of understanding. It provides students with a broad foundation of knowledge and skills in the liberal arts combined with a coordinated, self-designed program of studies in an area of individual student interest.

The program attracts highly motivated students who wish to assume significant responsibility for the content and direction of their studies. Humanities students develop skills of analysis, critical assessment and effective communication as they study diverse works of art, music, literature, history, philosophy, and the sciences. Individually designed programs may cover the full range of student interests: for example, the social and ethical implications of genetic engineering or the examination of a historical period through study of its literature, arts, history, philosophy, and sciences.

Students with specific career interests are encouraged to consult with the college’s academic advisers to identify courses appropriate to their needs and interests. Study in areas such as business or computer information systems, for example, can often be combined successfully with the humanities major.

Humanities majors find employment in a wide range of fields or pursue graduate study in fields such as law or education. Skills and knowledge developed through the major are important in virtually all social and career responsibilities, although the humanities major is not preparation for a specific career.

### Humanities Program of Study

For the humanities major at UNH Manchester, students must complete 40 credits with a minimum grade of C in each course. The required courses for the humanities major are:

#### Core Courses (required of all majors)

- HIST 500, Introduction to Historical Thinking
- ENGL 419, Introduction to Critical Analysis
- HUMA 411, Humanities I
- HUMA 412, Humanities II
- HUMA 795, Humanities: A Study of Creativity
- HUMA 796, Humanities: A Study of Contemporary Issues
Self-Designed Concentration

This is an approved program of studies designed by the student in consultation with a faculty advisor. In addition to courses available on the Manchester campus, students may, with prior approval, use courses from area colleges and the University’s Durham campus. The concentration is made up of two humanities courses (HUMA prefix) at the 600 or 700 level and three courses from any relevant discipline at any level.

For more information about the humanities major, contact Terry Savage, Ph.D., program coordinator at (603) 641-4149, or by e-mail to tmsavage@unh.edu; or contact the Office of Admissions at (603) 641-4150.

Politics and Society (B.A.)

The new politics and society program at UNH Manchester provides a range of tools to help students understand politics in social, economic, legal, and historical contexts. The 128-credit, interdisciplinary program explores politics in the real world. Through 56 credits in major coursework including research, internships, and the senior capstone project, students connect with local, state, and national politics. They develop critical thinking, communication, and research skills essential for graduate education and positions in journalism, government, politics, diplomacy, and business.

For complete program requirements including course descriptions, contact Michael Contarino, Ph.D., program director, (603) 641-4138, e-mail mcl@cisunix.unh.edu.

Psychology (B.A.)

For course descriptions, see page 268.

Psychology is the scientific study of behavior. The UNH Manchester psychology program provides students with a broad background in psychology, introducing them to both the experimental and clinical perspectives in the field. It seeks to understand the fundamental principles involved in how people and animals learn and adapt to their environments.

The Department of Psychology offers opportunities for independent study in cooperating New Hampshire mental health and rehabilitation facilities. Students have worked in hospitals, halfway houses, mental health centers, and other agencies. The department also invites guest speakers to discuss important issues in the field.

Psychology graduates find employment as trained research assistants, mental health aids in a wide variety of human services agencies, social welfare caseworkers, teachers in special education programs, and professionals in government, business, and industry. It is normally expected that students who wish to do professional work in the field of psychology will pursue graduate training at the M.A., M.S., Ph.D., or Psy.D. level.

The psychology major provides students with a broad education, while also allowing some specialization. The program exposes students to the scientific study of behavior and encourages an understanding of the behavior of humans and animals.

Psychology Program of Study

Students majoring in psychology must complete 44 credits with a minimum of C- in each course and a 2.00 overall average in all major requirements. Students with a first major in psychology may not use any psychology courses to fulfill general education requirements.

Transfer students who elect to major in psychology must complete at least 24 credits in the program at UNH/UNH Manchester to qualify for the degree in psychology. Transfer students must earn a total of 44 approved credits for completion of the psychology major. The department’s academic counselor will determine the distribution of these credits. Transfer students should note that courses are allotted only the number of credits granted by the original institution (after adjustments for semester-hour equivalents). Thus, students transferring from an institution at which courses carry less than 4 credits each must make up for any credit deficit created by acceptance of transfer credits into the psychology major.

Specific course selections should be discussed with the advisers. Exceptions to the requirements for the major require a petition to the department.

Program Requirements

A. Three core courses (PSYC 401, 402, and 502)

B. Four 500 level depth courses

Group I: Two courses:
PSYC 511, 512, 513, 521, 531, 531, 591
(only Behaviorism section)

Group II: Two courses:
PSYC 522, 533, 534, 561, 571, 581, 582, 583

C. Four 700 level depth courses

Four 700 level courses (1 from Group I, 1 from Group II, and 2 from Group I and/or Group II). PSYC 702 and PSYC 705 may be substituted for one Group I or one Group II course, but they may not both be used to fill the same group.

Registered Nurse Baccalaureate Program (B.S.)

For course descriptions, see page 267.

As health care moves to advanced practice, prevention and community-based programs, nurses with professional credentials have increased responsibility in directing nursing care.

The UNH Department of Nursing in the School of Health and Human Services offers the registered nurse baccalaureate degree (BSN) as a program designed to reach the diverse geographical population of registered nurses in New Hampshire, Massachusetts, Vermont, and Maine. A nationally accredited program, the curriculum builds upon the students’ prior learning and his or her RN credential. The individualized, competency-based program is flexible and recognizes the value of the practicing nurse. An RN may earn advanced standing through transfer credit and challenge examinations.

An RN who is prepared with a baccalaureate degree in nursing is eligible to work in all areas of nursing with healthy or ill clients and in all health care settings. The Bachelor of Science degree is often required for management positions and community health programs. The program also prepares nurses for graduate-level study.

Graduates of recognized nursing programs who meet University admission criteria may pursue the program on a full- or part-time basis. Curriculum requirements may be met through transfer credits, course enrollments, and challenge examinations. A valid RN license and one year of practice experience are preferred though not mandatory for upper level nursing coursework. The nursing component is based on the belief that RN students enter the program with knowledge and competence gained through previous educational and work ex-
The sign language interpretation program at UNH Manchester is a specialized, in-depth program with a national reputation.

**RN Baccalaureate Program of Study**

RNBP degree requirements are satisfied by the completion of 128 credit hours with a grade average of C or better. Thirty-five credit hours are obtained in upper division nursing coursework with the remaining credit hours in the University’s general education requirements, nursing prerequisite credit hours, and general elective credit hours. Nursing coursework with grades of C or better from associate degree programs transfer for full credit.

Prior to registering for nursing courses with a clinical component, students must submit the following:

- Copy of current C.P.R. Certification (provider or equivalent)
- Proof of liability coverage
- A completed immunization form
- Current RN License

**Prerequisite Courses**

- English Composition
- Human Anatomy & Physiology I & II
- Human Development (Life Span)
- Microbiology
- Nutrition in Health & Disease
- Psychology
- Statistics

**Nursing Courses**

- NURS 606, Seminar on Professional Nursing
- NURS 617, Nursing and Health Care Policy
- NURS 622, Clinical Decision Making II
- NURS 645, Research in Nursing
- NURS 655, Community Health Nursing I: Population Health
- NURS 656, Community Health Nursing II: Individuals, Families and Aggregates
- NURS 656C, Nursing in the Community: Clinical
- NURS 703, Nursing Leadership/Management and the Organizational Context
- NURS 719, Professional Nursing Practice

For more information, contact Susan Fetzer, R.N., Ph.D., M.B.A., program coordinator at (603) 641-4140 or (603) 358-2606, or by email to fetzer@unh.edu. Or contact the UNH Manchester office of Admissions at (603) 641-4150; email unhm.admissions@unh.edu.

**Sign Language Interpretation (B.S.)**

*(For course descriptions, see pages 259 and 269.)*

The sign language interpretation program at UNH Manchester is a specialized, in-depth program with a national reputation for quality. In 1999, the program became the first interpreting program in the nation to be found in compliance with the National Interpreter Education Standards of the Conference of Interpreter Trainers (CITT). In addition, UNH Manchester houses one of northern New England’s most comprehensive collections of books and media materials on sign language interpretation.

The program is guided by the premise that Deaf people, as a linguistic minority, possess their own cultural values, literature, history, traditions, and social conventions. Interpretation requires bilingual and bicultural competence in spoken English and American Sign Language. The sign language interpretation program at UNH Manchester provides students with a strong theoretical foundation as a generalist in ASL/English interpretation and helps prepare students for either state-level interpreter screening or national Registry of Interpreters for the Deaf (RID) interpreter certification, depending on students’ skill level and experience.

Graduates may go on to pursue specialty areas in interpretation or related fields of study.

Students who complete the bachelor of science degree in sign language interpretation graduate with a varied and flexible academic base. Students also develop skills such as sustained powers of concentration, versatility in dealing with a variety of people and content areas, fast-thinking, and excellent communication skills in the respective languages. Students seeking to become interpreters receive a foundation in American Sign Language, Deaf culture, and the interpretation process, and their programs of study often include elective courses in linguistics, sociology, communication, and psychology. Students also gain a thorough grounding in the liberal arts through the University’s general education program.

Graduates of the sign language interpretation program may pursue careers in ASL/English interpretation, Deaf education, rehabilitation, health care, audiology, social work, counseling, and the media. The program provides students with a varied and flexible academic base. Graduates are prepared for further study in such fields as psychology, communication, linguistics, sociology, and anthropology.

**B.S. Sign Language Interpretation Program of Study**

Students must complete 64 credits in the major, 40 credits in the University’s general education program, and 24 credits in elective courses. Students must complete 64 credits with a grade of C or better. Students who earn less than a C on a particular course may repeat that course only once. Students must achieve a GPA of 2.5 or better in major courses and must pass both ASL 531 and INTR 630 with at least a B- (or successfully demonstrate competence in American Sign Language and consecutive interpretation, respectively). Transfer students must complete a minimum of 8 SLI courses at UNH Manchester.

**Minor in American Sign Language and Deaf Studies**

Students must complete 24 credits to earn a minor. Coursework includes three required courses and three electives in ASL and Deaf Studies.

**Required Courses**

- Language Courses
  - ASL 435, American Sign Language I†
  - ASL 436, American Sign Language II†
  - ASL 531, American Sign Language III†
  - ASL 532, American Sign Language IV†
  - ASL 621, Advanced ASL Discourse for Interpreters†
  - INTR 539, Comparative Linguistic Analysis for Interpreters†

- Culture Courses
  - INTR 430, A Sociocultural Perspective on the Deaf Community†
  - INTR 658, Deaf/Hearing Cultural Dynamics†

- Interpreting Courses
  - INTR 430, Introduction to Interpretation*†
  - INTR 439, Ethics & Professional Standards for Interpreters*†
  - INTR 540, Principles and Practice of Translation*†
  - INTR 630, Principles and Practice of Consecutive Interpretation*†
  - INTR 636, Principles and Practice of Simultaneous Interpretation*†
  - INTR 732, Simultaneous Interpretation of Discussions, Speeches, and Reports*†
  - INTR 734, Field Experience and Seminar I*†
  - INTR 735, Field Experience and Seminar II*†

* Required for the B.S.
† Meet the requirements for the minor

For more information about the sign language interpretation program, contact Professor Jack Hoza, program director, (603) 641-4145 or e-mail jack.hoza@unh.edu. Or contact the UNH Manchester Office of Admissions at (603) 641-4150; e-mail unhm.admissions@unh.edu.

* Required for the B.S.
† Meet the requirements for the minor
The Undeclared Option

Students who are admitted to UNH Manchester as bachelor's degree candidates, but who prefer to postpone the declaration of a major or academic specialization, may do so through the undeclared option. Undeclared students may take until the second semester of their sophomore year to select a major.

Applicants for admission to UNH Manchester who are uncertain of their academic interests are encouraged to apply as undeclared. After admission undeclared students are assisted by academic advisers in purposeful exploration of academic interests and in making appropriate course selections. At UNH Manchester, the undeclared option can also be an effective way to prepare for entry to a variety of academic programs that are available at the Durham campus only. Students must declare a major by the time they attain 57 semester hours.

Undeclared Program Requirements and Program of Study

To graduate from UNH, students must fulfill three types of requirements: University (general education), degree, and major requirements.

While undeclared, students develop their program of study with the guidance of an academic adviser. They work toward completing their general education requirements and explore their interests and possible baccalaureate degree majors. Once a major is declared, the student follows the major program of study to fulfill graduation requirements.

To graduate with a baccalaureate degree, students must complete the following requirements:

- Completion of at least 128 credits with a minimum cumulative grade-point average of 2.0.
- Completion of four writing intensive courses, one of which must be ENGL 401, First-Year Writing
- Completion of the University general education requirements.
- Proficiency in a foreign language.
- Satisfaction of major requirements.

The last 32 hours of credit must be UNH courses completed following admission and matriculation, unless prior permission is granted to transfer part of this work from another institution.

For more information about the Undeclared major, call the UNH Manchester Office of Admissions at (603) 641-4150, or e-mail unhm.admissions@unh.edu.

FACULTY

Professors: Deborah Brown, John J. Cerullo, Thaddeus M. Piotrowski, John P. Resch

Associate Professors: Ralph W. Draper, David A. Forest


Assistant Professors: Gail Fensom, Jack E. Hoza, Sarah Prescott Kenick, Roberta Kieronski, John F. McCarthy, Patrice T. Mettauer, Anthony Tenczar, Karla E. Vogel

Senior Lecturer: Robert M. Pugh

Lecturers: Walter Alderman, Patrick F. McCarthy, William F. Troy
The Graduate School offers a wide range of programs leading to the master's degree, one program leading to the C.A.G.S., and a number of programs leading to the Ph.D. degree. Graduate programs have been developed systematically to achieve academic excellence by careful utilization of institutional resources and regional opportunities. A highly qualified graduate faculty supervises programs and establishes the requirements for admission and degrees, which are administered by the dean of the Graduate School. The Graduate School extends its programs to central and southern New Hampshire through the Center for Graduate and Professional Studies. Located on the campus at the University of New Hampshire at Manchester, the center offers a number of part-time professional master's programs.

Admissions

Persons holding a baccalaureate degree from an accredited college or University and wishing to take graduate-level courses at the University as part of a graduate degree program must apply for admission to the Graduate School. Admission to the Graduate School is both limited and competitive and is based solely upon academic qualifications and potential.

Applications for admission and the Graduate Catalog, containing detailed descriptions of graduate programs, may be obtained from the Graduate School, Thompson Hall, 105 Main Street, Durham, N.H. 03824-3547 or www.gradschool.unh.edu.

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 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 enroll for a maximum of two courses for up to eight graduate credits prior to completing their bachelor's degree.

Dual Credit-UNH Seniors

University of New Hampshire seniors who have been admitted to the Graduate School under early admission may, upon recommendation of the department and approval of the Graduate School, be allowed a maximum of two graduate-level courses for up to 8 credits 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.

Financial Assistance

Graduate assistantships are available in most departments. These involve part-time work in connection with the University's instructional or research activities. University awards, such as tuition scholarships, are also available to qualified students. Assistantships and scholarships are awarded on the basis of academic qualifications.

Financial assistance in the form of college work study and loans may be available through the Financial Aid Office.

UNH Center for Graduate and Professional Studies

The Center for Graduate and Professional Studies offers a wide range of post-baccalaureate programs for professionals in business, education, social services, healthcare, government, and related fields. All graduate programs supported by the center are directed by UNH faculty and are administered by the UNH Graduate School. Currently, master's degree or other post-baccalaureate courses and programs are offered in Manchester in: Business Administration, Counseling, Educational Administration, Teacher Education, Public Administration, Public Health, Social Work, and Nursing.
**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 Arts in Liberal Studies
- Master of Fine Arts
- Painting
- Writing

**Master of Public Administration**

**Master of Public Health**
- Ecology
- Nursing
- Policy and Management

**Master of Social Work**

**Certificate of Advanced Graduate Study**
- Educational Administration and Supervision

**Doctor of Philosophy**
- Animal and Nutritional Sciences
- Biochemistry
- Chemistry
  * Chemistry Education
- Computer Science
- Earth and Environmental Sciences
  * Geology
  * Oceanography
- Economics
- Education
- Engineering
  * Chemical Engineering
  * Civil Engineering
  * Electrical Engineering
  * Materials Science
  * Mechanical Engineering
  * Ocean Engineering
  * Systems Design
- English
- Genetics
- History
- Mathematics
- Mathematics Education
- Microbiology
- Natural Resources and Environmental Studies
- Physics
- Plant Biology
- Psychology
- Sociology
- Zoology

* Option within the major.

**Professional Development and Training**

Professional Development and Training, part of UNH’s Center for Graduate and Professional Studies, serves individuals, businesses, and organizations in New Hampshire and surrounding regions by offering a wide range of professional development opportunities throughout the year, including one-day seminars, special institutes and conferences, and short-term Certificate Programs.

Programs are designed to assist professionals in developing new or advanced knowledge and skills in a variety of fields. Instruction provides a balance of theory and practical skills that participants can immediately apply to the workplace.

Offerings focus on pertinent topics in business, management and supervision, professional coaching, human resources, computers, CAD, teaching and school administration, health and human services, engineering, manufacturing, surveying, soil science, town and state planning, fundraising and grant writing, and more.

Training is offered on the Durham campus, in Manchester, and at the UNH training facility at Pease International Tradeport in Portsmouth.

From time to time, institutes and conferences are held to address current topics of concern at an in-depth level.

Professional Development and Training also offers customized training services—helping companies assess their training needs, and then designing and delivering customized training to meet these needs.
CONTINUING EDUCATION AND SUMMER SESSION

Continuing Education provides public access to higher education for individuals not formally admitted into a UNH degree program. Taking courses as a non-degree student is an excellent way to prepare for matriculation into a degree program, help advance or change careers, or study a topic of interest.

Non-degree Student Status

Undergraduate  Undergraduate courses (numbered 200-799) are open to individuals with a high school diploma or GED. Individuals may register for a maximum of 11 credits per term without special permission.

Graduate  Graduate courses (numbered 800-999) are open to individuals with a bachelor's degree from an accredited college or university. Individuals may register for a maximum of 8 credits per term without special permission.

Full-time Special Student Status

Undergraduate  Non-degree students who wish to register for 12 or more credits in a single semester must receive written permission from the Office of Admissions. Special tuition and fee rules apply. Call (603) 862-1360 for more information.

Graduate  Non-degree students who wish to register for 9 or more credits in a single semester must receive permission from the Graduate School. Students approved for this special status must pay full-time graduate tuition and fees at the time of registration. Call (603) 862-3000 for details.

Pre-Admission Program

The pre-admission program allows students an opportunity to strengthen their academic credentials in preparation for admission to a baccalaureate program by completing coursework that satisfies both general education and introductory level major requirements. Students complete two semesters in the program, register for up to 12 credits per semester, and then transfer to a baccalaureate program upon successful completion of the outlined criteria. Visit www.admissions.unh.edu or call (603) 862-1360 for details.

CATS Program

CATS stands for “Challenging Academically Talented Students” and is open to highly motivated and academically strong high school juniors and seniors who want to enrich their academic experience with a college-level course. Students may choose from freshman level courses (400-500 numbered courses). For an application or more information, please visit www.admissions.unh.edu/cats/index.html or call (603) 862-1360.

Prerequisites

Individuals are responsible for meeting all course prerequisites before registering for classes. Visit www.learn2.unh.edu/courses/prerequisites.html for undergraduate and graduate course descriptions and prerequisite information.

Academic Standards and Expectations

A cumulative grade-point average of 2.00 (C grade) is the minimum acceptable level for undergraduate work at the University. The records of special undergraduate students are examined periodically, and academically deficient students may be warned or excluded from registering. All non-degree students are expected to become familiar with and adhere to the current UNH Student Rights, Rules and Responsibilities available online at www.unh.edu/student/rights.

Student Resources

Non-degree students are encouraged to take advantage of the wide range of resources available on campus. Visit www.learn2.unh.edu/resources/ for a complete list of student services and campus resources.
**Professional Development and Training**

Professional Development and Training, an affiliate office of the Graduate School, serves individuals, businesses, and organizations by offering a wide range of non-credit professional development opportunities throughout the year. Programs are designed to assist professionals in developing new or advanced knowledge and skills in a variety of fields. Training is offered in Durham, Manchester, and Portsmouth. For more information, visit www.learn.unh.edu or call (603) 862-4234.

**Summer Session**

Summer Session provides a wide range of credit and non-credit courses, institutes, and programs in a variety of term lengths from May to August. From youth enrichment programs to advanced level institutes, Summer Session provides educational opportunities for learners of all ages. On-campus housing is available for students enrolled in summer credit courses. Please note that summer credit courses are held to the same academic standards as regular term courses but are typically offered at an accelerated pace. For more information, please visit www.learn.unh.edu or call (603) 862-2015.
**Description of Courses**

**Explanation of Arrangement**

The title and Arabic number designate the particular course. When two course numbers are connected by a hyphen, the first semester of the course, or its equivalent, is a prerequisite to the second. If the course numbers are separated by a comma, qualified students may take the second semester without having had the first. Course numbers separated by a slash indicate same subject offerings at lower and upper levels.

In courses that are not designated by title as laboratory courses, the notation "Lab" indicates that laboratory sessions are a part of the course.

All courses marked with "#" have not been offered in the last three years.

**Prerequisites and Corequisites**

Each prerequisite for a course is separated from the other prerequisites by a semicolon; e.g., Prereq: EDUC 601; PSYC 635. If permission (of the instructor, department, adviser, or committee) is a prerequisite for all students, it is listed among the prerequisites (e.g., Prereq: EDUC 601; PSYC 635; permission). If, on the other hand, permission may be substituted for one or more of the listed prerequisites, it follows the other prerequisites and is separated from them by a slash mark (e.g., Prereq: EDUC 601; PSYC 635/permission). If permission may be substituted for only one of the prerequisite courses, it is listed with the course for which it may be substituted (e.g., Prereq: EDUC 601 or permission; PSYC 635).

Corequisites are courses that must be taken in the same semester.

**Credits**

The number of credits listed is the number of semester credits each course number will count toward graduation (except in the case of variable credit courses). Students must register for the number of credits shown or, if the course is variable credit, within the range of credits shown.

"Cr/F" following the description indicates that no letter grade is given but that the course is graded Credit or Fail.

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.*

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**Accounting & Finance (ACFI)**

*(For program description, see page 104.)*

620. Topics in Accounting

Special topics; may be repeated. Prereq: ACFI 621 or ACFI 723 depending on topic and junior standing. 4 cr.


Examination of the nature and applicability of accounting theory and the conceptual framework of accounting. Development of the capacity to address and resolve issues and problems in financial reporting. Topics include valuation and reporting of current and operating assets, and revenue recognition. Prereq: ADMN 502. 4 cr.

622. Intermediate Financial Accounting II

Selected topics within financial reporting such as accounting for investments, leases, pensions, and income taxes. Focus on how and why these issues are accounted for in the manner prescribed by current GAAP. Prereq: ACFI 621. 4 cr.

640. Topics in Finance I

Special topics; may be repeated. Prereq: ADMN 601 and junior standing. 2 to 4 cr.

650. Wildcat Investment Fund

Students actively manage the Wildcat Fund, a donor-created fund which consists of cash and stocks. During weekly meetings, students present their stock selections to the group and debate the merits of the presented stocks. Traditionally, an officer corps is responsible for structuring and coordinating the group. Students in good standing may retake course up to a maximum of 4 credits. Prereq: permission. 2 cr.

701. Financial Policy

Development of analytical tools and practical skills for recognizing and solving complex problems of business finance. Working-capital management, capital budgeting, cost of capital, capital structure, and dividend policy. Prereq: ADMN 601. 4 cr.

702. Investments Analysis


703. International Financial Management

Financial management problems facing multinational firms. Primary focus on effects of currency denominations on financial decisions. Prereq: ADMN 601. 4 cr.

704. Derivative Securities and Markets

Derivative assets and markets, and their role in business decision-making and portfolio management. Emphasis on practical and theoretical aspects of hedging and speculating using futures and options for both commodities and financial assets, including their market mechanics. Prereq: ADMN 601. 4 cr.

705. Financial Institutions

Examination of financial institutions and markets. Emphasis on how institutions create value, the regulatory environment under which they operate, and the role of risk management. Prereq: ADMN 601. Writing intensive. 4 cr.

720. Topics in Finance II

Special topics. Prereq: ADMN 601 and senior standing. Writing intensive. 4 cr.

723. Advanced Managerial Accounting Concepts and Applications

Builds on the basic managerial accounting course by continuing the theme of accounting as a management tool. Emphasis is on cost accounting as a source of data for measuring and improving the economic condition of the enterprise. Newly evolving management themes are integrated into the traditional topics of planning and control, cost analysis, overhead allocation, transfer pricing, and decision modeling. Prereq: ADMN 503. 4 cr.

724. Auditing

Philosophy and environment of auditing, with attention to an understanding of the major auditing concepts and objectives and its judgment process. Emphasis on the nature and economic purpose of audits, standards, professional ethics, auditors' liability, internal control, and audit evidence. Includes audit procedures, reports, and computer software. Prereq: ACFI 621. Writing intensive. 4 cr.

725. Financial Statement Analysis

Methods and tools of analysis and interpretation of financial statement data. Use of financial information in a variety of decision making situations including a prediction of corporate earnings, debt ratings, and financial distress; lending decisions; risk analysis; and equity valuations. Prereq: ACFI 621 and senior standing. Not offered every year. 4 cr.

726. Introduction to Federal Income Tax

Federal income tax concepts and law applicable to individuals. Coverage includes taxable income and deductions, passive activities, alternative minimum tax, property transactions and compensation. Prereq: ADMN 502. 4 cr.
740. Topics in Accounting II
Special topics. Prereq: ACFI 621 or 723, depending on topic, and senior standing. 4 cr.

750. Internships in Accounting
Accounting fieldwork in a business or other type of organization. Supervision provided by the organization, and consultation provided by the faculty sponsor. Written report required. Course credits vary according to the nature of the fieldwork, to be determined by the faculty sponsor. Prereq: seniors in high standing; permission. Cr/F. 1 to 4 cr.

751. Internships in Finance
Finance fieldwork in a business or other type of organization. Supervision provided by the organization, and consultation provided by the faculty sponsor. Written report required. Course credits vary according to the nature of the fieldwork, to be determined by the faculty sponsor. Prereq: seniors in high standing; permission. Cr/F. 1 to 4 cr.

752. Independent Studies in Accounting
Student-designed individual research projects, approved by a faculty sponsor. Paper required. Course credits vary according to the nature of the project, to be determined by the faculty sponsor. Prereq: seniors in high standing; permission. 1 to 4 cr.

753. Independent Studies in Finance
Student-designed individual research projects, approved by a faculty sponsor. Paper required. Course credits vary according to the nature of the project, to be determined by the faculty sponsor. Prereq: seniors in high standing; permission. 1 to 4 cr.

754. Honors Seminar in Accounting and Finance
Seminar discussions of advanced readings in accounting and finance. For seniors with standing in the honors program. 4 cr.

406. Freshman Academic Experience II
Reading and a question-focused discussion of a volume or book of readings on an important business and/or economic topic. Further consideration of academic issues facing college freshmen. How to deal with difficult academic problems. Cr/F. 1 cr.

410. Management Information Systems
This course provides an introduction to computer literacy, basic computer hardware and software concepts, business applications of information technology and computer ethics. Hands-on exercises include spreadsheets, databases and web pages. Prereq: ADMN 403. 4 cr.

420. Business Statistics
Introductory coverage of statistical methods for managerial decision-making: probability, descriptive and inferential statistics, and regression. Quantitative techniques common to many introductory statistics courses are covered, but their interpretation is enhanced in terms of uncertainty, inferences from sample data, and model formulation, and on utilizing these techniques as aids in decision-making. No credit for students who have had ADM 430; BIOL 528; EREC 525; HHS 540; MATH 644, PYSC 402; SOC 502. Prereq: ADMN 403 and 410; MATH 420 or 424A. 4 cr.

444. Corporate Social Responsibility in a Global Economy
An in-depth exploration of the relationship between the modern corporation and democratic values. Among industrialized democracies, corporate concentrated economic power privileges those who strategically control the firm and have direct claims on the firm’s surplus. This surplus generates new wealth which raises living standards over time. Also explores the tension between the rights of the private/civil sector and the reach of government. Writing intensive. 4 cr.

502. Financial Accounting
Fundamentals of financial accounting concepts and procedures for analyzing economic events and the preparation and use of financial statements. No credit for students who have had ACFI 501 or ADM 532. 4 cr.

503. Managerial Accounting
The use of information by managers to (1) determine the cost and profitability of the organization’s products or services; (2) plan, control, and evaluate routine operations; and (3) make special non-routine decisions. The demand for managerial accounting information is derived from an integrated treatment of organizational objectives, an orientation to customers, and a focus on activities as the unit of analysis for understanding of cost, quality, and time. No credit for students who have had ADM 533. Prereq: ADMN 502. 4 cr.

601. Introduction to Financial Management
The investments, financing, and dividend decisions of the firm in a global setting. Topics include capital budgeting, designing and issuing securities, manager performance evaluation, resolution of agency problems, and working capital management. Open to WSBE majors only. Prereq: ECON 401. 4 cr.

611. Behavior in Organizations
Behavioral science concepts applied to work settings. Focus on understanding and analyzing individual beliefs, values, goals, perceptions, motivations, commitment, and decision making; group structures and processes (interpersonal skills, communication, conflict resolution, leadership, and team work); organizational control systems (rewards, task design, performance appraisal); outcomes (satisfaction and development of the person as well as the organization); and organizational change. Open to WSBE majors only. No credit for students who have had MGT 580. Prereq: ADMN 400; ADMN 410. Prereq or Coreq: ADMN 503. Writing intensive. 4 cr.

640. Quantitative Decision Making
Introduction to the use of quantitative tools in the decision-making process of an organization. Planning and operational problems in the manufacturing and services sectors are emphasized. Topics include forecasting, capacity planning, optimization, project scheduling, simulation and risk analysis, quality, inventory management, and waiting lines. Open to WSBE majors only. Prereq: ADMN 420; ADMN 503. 4 cr.

651. Marketing
Covers marketing as the process of planning and developing goods and services to satisfy the needs of target customers: consumers, other businesses, institutions. Focus on how marketing contributes to the firm’s goals through product planning, pricing, promotion, and distribution policies. Open to WSBE majors only. No credit for students who have had Mktg 550 or HMGT 600. Prereq: ADMN 400; ECON 40 4 cr.

685. Study Abroad
Open to students studying abroad in the discipline as approved by the department chair and Undergraduate Programs Office. Special fee. Cr/F. 1 to 16 cr.

686. Study Abroad
Open to students studying abroad in the discipline as approved by the department chair and Undergraduate Programs Office. Special fee. Cr/F. 1 to 16 cr.

695/695W Independent Study
Individual research projects that are student designed. Initial sponsorship of a business administration faculty member must be obtained, and approval of WSBE Undergraduate Programs Office and department chair. For juniors and seniors in high standing. 1 to 12 cr. 695W is writing intensive.

696. Supervised Student Teaching Experience
Participates are expected to perform such functions as leading discussion groups, assisting faculty in undergraduate courses that they have successfully completed or working as peer advisers in the advising center. Enrollment is limited to juniors and seniors who have above-average G.P.A.s. Reflective final paper is required. Prereq: permission of instructor, department chair, and director of undergraduate programs. No more than four credits may be earned as a teaching assistant in any one course. Cr/F. 1 to 4 cr.

703. Strategic Management: Decision Making
Capstone course: Problem-solving, decision-making, and strategic thinking relative to managerial, economic, ethical, legal, political, social, and technological aspects of an organization’s environment. Integrates the functional discipline skills within the role of the general manager as leader and chief strategist, organizational builder and doer. Case discussion and analysis, industry and competitive analysis, environmental scanning, industry simulation, strategic audit, stakeholder analysis, values, ethics and social issues management within the public policy process are important course com-

Administration (ADMN)
(For program description, see page 103.)

400. Introduction to Business
This course will introduce students to business organizations, the business disciplines and critical issues in contemporary business. The priority will be in having students develop strong intellectual foundations in business, knowledge of core disciplines of business, and an awareness of businesses’ role in the economy and in the larger society. The course will include once a week lectures and also small group discussion sessions. The lectures will be organized by the lead WSBE faculty person and include visits and discussions with executives from New Hampshire companies. Writing intensive. 4 cr.

403. Computing Essentials for Business
Self-paced course covering the fundamental skills and proficiency of general business software applications. Topics will include word processing and spreadsheet applications. Cr/F. 1 cr.

405. Freshman Academic Experience I
An introduction to the nature of academic knowledge, academic standards, and academic management skills essential for success in the University and the Whittome Moreh School. An introduction to a volume or book or readings on an important business and/or economic topic. Cr/F. 1 cr.
671. Air Force Leadership Studies I
Organizational and personal values; management of forces in change; organizational power, politics, managerial strategy, quality, and tactics; Air Force cases studied. 4 cr.

672. Air Force Leadership Studies II
Organizational and personal values; management of forces in change; organizational power, politics, managerial strategy, quality, and tactics; Air Force cases studied. 4 cr.

681. National Security Affairs I
Focus on the armed forces as part of American society, emphasizing civil-military relations in context of U.S. policy formulation and implementation. Requirements for adequate national security forces; political, economic, and social constraints on the national defense structure; impact of technological and international developments on strategic preparedness; the variables involved in the formulation and implementation of national security policy. 4 cr.

682. National Security Affairs II
Focus on attitudes toward the military, socialization processes, role of the professional military leader-manager, and military justice and administrative law. 4 cr.

695. Officer Internship (Air Force)
Experiential learning through class and field work in a military environment. Written analysis required. Prereq: AERO 671 (maybe taken concurrently). Permission of department chair required. For AFROTC cadets only. Cr/F. 4 cr.

American Studies (AMST)
(For program description, see page 25.)

#444A. Portable, Exportable Nation
Through specific case studies and theories on national identity and cultural transmission, the course explores American efforts to "export" American ideas, values, and products to other parts of the world. The final project involves students "exporting" their own ideas about U.S. culture by building a class Web site (the "portable" nation), which is open to students in other countries. Writing intensive. 4 cr.

444B. New Orleans: Place, Meaning, and Context
Course uses literature, essays, film, music, debate, and discussion, to explore the topics of place, history, people, politics, art and literature, and music. Lectures, discussion, assignments, and group projects will touch on issues regarding race, poverty, power, social mobility, gender roles, crime, corruption, energy, and the environment. 4 cr.

444C. Photographing America
How has the camera shaped the way we see ourselves, and the world around us? How can we "read" a photograph? What kinds of ethical and aesthetic concerns are involved in recording "reality?" What is the relationship between art and social concerns? How do photographers tell stories, and with what consequences? In what ways do photographers borrow literary images, and writers borrow photographic techniques? How does thinking visually change the way we read? How have photographers and writers—sometimes self-consciously and sometimes unwittingly—affected the definitions of what it means to be an American? What does something "American" look like, anyway? In this class, we'll try to answer these questions in all their complexity by looking at both photographic and written documents, from the late nineteenth century, when photography was a relatively new technology, to the present. Writing intensive. 4 cr.

501. Introduction to American Studies
An introduction to the basic methods used in the interdisciplinary study of history, literature, arts, and other aspects of the life and culture in the United States, with a special focus on a local New England sub-region: the Piscataqua river, Manchester, Boston, Portland, and the White Mountains, with an emphasis on the multiracial, multilingual, and multicultural nature of New England culture. Disciplinary approaches drawn from literature, history, environmental studies, folklore, material culture, art history, architecture, film, anthropology, and sociology. May include guest lectures, field work, trips. Required for students minoring in American studies. Writing intensive. 4 cr.

502. Introduction to African-American Literature and Culture
An introduction to African-American literature in the context of a variety of cultural perspectives. Course topics may include: major writers, literary genres, historical periods, Harlem Renaissance, Black Arts Movement, fine and folk arts, religion, music, and film. (Also offered as ENGL 517.) Writing intensive. 4 cr.

503. Introduction to Native American Studies
An introduction to the methods used in the interdisciplinary study of the history, literature, material culture, and other aspects of life and culture among Native American peoples. Specific tribes and nations covered may vary, but concepts emphasized include contact, colonialism, and sovereignty. (Also offered as ENGL 540.) 4 cr.

603. Photography and American Culture
Interdisciplinary study of the relationship between photography and the literature, art, politics, and history of the nineteenth and twentieth centuries. Introduces theories of photography as well as works of individual artists. Topics vary from year to year. Writing intensive. 4 cr.

604. Landscape and American Culture
Interdisciplinary study of the perception, representation, and/or construction of nature. Topics vary from year to year and may include: landscapes in nineteenth-century literature and art, colonial mapping of the Americas (traditions of writing and cartography), Native American traditions of land perception, and the twentieth-century emergence of ecocriticism. Writing intensive. 4 cr.

605. Film in American Culture
Advanced, focused study of American cinema. Topics vary from year to year and with instructor. Focus may range from general consideration of American film history, theory, and criticism, to specific analyses of selected types of American cinema: "classical" Hollywood, "new" Hollywood, and "alternatives" to specific periods, movements, genres, and film-makers. Prereq: ENGL 533, or CMN 550, or permission. Special fee. Writing intensive. 4 cr.

607. Religion in American Thought and Life
Interdisciplinary study of the varied nature of American religious experience and its relationship to other aspects of American culture. Topics vary from year to year, and may include, for example: the interdisciplinary study of a spiritual community, African-American religious history, material culture and spiritual expression, politics
and religious free speech, religious culture in the nineteenth-century, multi-ethnic American religions, and literature. (Also offered as ENGL 607, HUMA 607, RS 607) Writing intensive. 4 cr.

608. Women Artists and Writers 1850-Present
Studies the impact of gender on the lives and works of selected American artists. Considers lesser known figures such as Fannie Fern, Lily Martin Spencer, and Mary Hallock Foote as well as better known artists such as Willa Cather and Georgia O’Keeffe. Prereq: permission, or one of the following: WS 401, HIST 566, ENGL 585, 586, 685, 785, or a 600-level art history course. (Also offered as ARTS 608, ENGL 608, HIST 608, and HUMA 608.) Not offered every year. Writing intensive. 4 cr.

609. African American Experience in the 20th Century
Investigates the music, literature, and social history of African American America in the period of the Harlem Renaissance, in the Great Depression, World War II, and in the 1960’s. Special attention to the theme of accommodation with and rejection of dominant white culture. (Also offered as ENGL 609, HUMA 609.) Writing intensive. 4 cr.

610. New England Culture
An interdisciplinary course investigating some of the major contributions New England has made to American life. Focuses on periods such as the Puritan era 1620-90, the Transcendentalist period (1830-1860), late nineteenth-century industrialism, and the contemporary era. New England places are also featured, such as Boston, Newport, Salem, the Connecticut River Valley, and rural northern New England. Course materials are drawn from the literature, history, art history, and material culture. Writing intensive. 4 cr.

611. Indigenous New England
An interdisciplinary introduction to the literatures, histories, and cultures of indigenous people located in what is now New England. Course topics may include U.S. American Indian policy, tribal government structures and resistance, history and forms of Native literacy, contemporary sovereignty struggles, popular culture, and film. At least one field trip to a regional Native community is required. Special fee. (Also offered as ENGL 740.) 4 cr.

612. Periods in American Culture
Intensive multidisciplinary study of the art, literature, material culture, and the social, political, and cultural movements of a specific period in the American past. Periods vary from year to year. Examples: the 1890’s, the 1960’s, the 1770’s, the 1950’s. May be repeated for credit if subject matter is different. 4 cr.

613. Regions in American Culture
The study of the culture, history, and politics of particular regions in the United States. Topics vary and may include: the history and literature of the South; natural resources, expansion, and European American/Native American contacts in the West; cultural interactions of the Southwest. May be repeated for credit if subject matter is different. 4 cr.

614. Native American Studies Topics
The multidisciplinary study of the histories, cultures, and the experiences of indigenous peoples. Topics vary and may include Native American/Euro-American interactions under colonialism, the so-called “Era of Assimilation,” and contemporary issues of sovereignty. May be repeated for a maximum of 8 credits if the subject matter is different. 4 cr.

615. Asian American Studies Topics
The multidisciplinary study of Asian American literature, culture, theory, and history. Perspectives may be drawn from gender studies, anthropology, cultural studies, film studies, and medicine. Topics vary and may include the study of contemporary fiction and film, representations of gender, of race and cultural pathologies, and of the ethnic body. May be repeated for a maximum of 8 credits if the subject matter is different. 4 cr.

620. Internship
Supervised internship with a governmental agency, non-profit institution, library, archives, museum, historical society, publishing company, or other institution seeking individuals interested in historical research, community development, or careers in education. Repeatable for a maximum of 8 credits. Permission required. Cr/F. 1 to 8 cr.

665. Applied American Environmental Philosophy
Applying the philosophical theory underlying environmental studies and approaches to environmental conservation. Students conduct critiques of extensive readings and write papers creatively analyzing aspects of selected philosophical works. Major research manuscript required. (Also offered as NR 665.) Writing intensive. 4 cr.

696. Special Topics
Focused study of an issue, problem, or theme in American Studies. Topics vary. For example: Black Protest in the 1960’s, the rise of consumer culture, domestic art, architecture and suburban planning. Barring duplication of subject, course may be repeated for credit. For details see the coordinator. Prereq: AMST 501, and another AMST course, or permission. Writing intensive. 4 cr.

697. Seminar in American Studies
Open to qualified juniors and seniors, with permission of the coordinator and the instructor. Intensive study of a specialized topic that varies from year to year. Enrollment in the seminar is limited to 15 so that all students can take an active part in the discussion and work closely with the instructor on their papers. Barring duplication of subject, course may be repeated for credit. For details see the coordinator. Prereq: a grade of B or better in AMST 501, completion of at least two other courses in the minor, permission. Not offered every year. 4 cr.

750. Independent Study
Open to qualified juniors and seniors. May include fieldwork or an internship at a museum, library, historical society, etc. To be elected only with permission of the coordinator and with qualified supervision. May be repeated up to 8 cr. 1 to 8 cr.

401. Animals and Society
The use of animals in agricultural production, for recreation, companionship, and research is considered. The nutrition, genetics, diseases, and reproduction of domestic animals are covered. Special fee. Lab. 4 cr.

402. Horsemanship
For beginning, intermediate, and advanced riders. Basics of balance seat, specializing in basic dressage, and combined training. There is no lecture with this summer course. Limited number of students may stable their horses at the University. Special fee. May be repeated for a maximum of 18 credits. Prereq: permission. 1 cr.

403. Summer Horsemanship
For beginning and intermediate riders. Basics of balance seat, specializing in basic dressage and combined training. There is no lecture with this summer course. Limited number of students may stable their horses at the University. Special fee. May be repeated for a maximum of 18 credits. Prereq: permission. 1 cr.

404. Introductory Equine Science
Survey of various areas of animal and veterinary science and opportunities available. Cr/F. 1 cr.

407. Animal Ethics: Your Child or Your Dog
The differences between animal welfare and animal rights, application of these two ethical philosophies to current uses of animals in research, as food (factory farming), the production and use of transgenic animals, and the use of animals as organ donors for humans (xeno-transplantation). Students will depend on information from other disciplines ranging from moral philosophy and ethics to history of genetics, production agriculture, and ethology. 4 cr.

408. Large Animal Behavior and Handling Techniques
Introduction to domestic large animal behavior and handling techniques. Cattle, horses, swine, and sheep are used in this course. Students perform routine health-related procedures, and gain knowledge and skills needed for work on animal production in the fields of veterinary science, animal research, commercial agriculture, and animal control. 2 cr.

410. Introduction to Dairy Herd Management Lab
Practical study of various aspects of dairy herd management. Farm visits and case studies will be involved. Should be taken concurrently with ANSC 409. (Not offered every year.) Coreq: ANSC 410. 3 cr.

415. Women and Science
The history of women in sciences, beginning with the first women scientists to women scientists in the 21st century. Exploration of a variety of topics in multiple disciplines to acquire a better understanding of the issues, including: culture, society, politics, economics, and gender; as well as race, class, and sexuality; which have affected the advancement of women in science through the centuries. Issues are examined to determine the status

Animal Sciences (ANSC)
(For program description, see page 86.)

400. ANSC 400. (Not offered every year.) 1 cr.

410. Introduction to Dairy Herd Management Lab
Practical study of various aspects of dairy herd management. Farm visits and case studies will be involved. Should be taken concurrently with ANSC 409. (Not offered every year.) 1 cr.

415. Women and Science
The history of women in sciences, beginning with the first women scientists to women scientists in the 21st century. Exploration of a variety of topics in multiple disciplines to acquire a better understanding of the issues, including: culture, society, politics, economics, and gender; as well as race, class, and sexuality; which have affected the advancement of women in science through the centuries. Issues are examined to determine the status
500. Methods of Therapeutic Riding
Comprehensive examination of therapeutic riding including types of therapeutic riding and its physical, mental, and emotional benefits for clients with a variety of disabilities. Topics include hypnotherapy, equine-facilitated mental health, equipment needs/modifications, special considerations for the therapy horse, and the role of the volunteer therapist, and instructor. Special fee. 4 cr.

507. Scientific Approach to Equine Discipline
Physiological development, control, and education; biting, lunging, driving, and equine gymnastics. Special fee. Lab. 3 cr.

511. Anatomy and Physiology
Introduction to the principles of human structure and function. Includes molecular and cellular mechanisms of major processes (such as muscle contraction, neural transmission, and signal transduction) and systematic aspects of the nervous, cardiovascular, respiratory, endocrine, gastrointestinal, and renal systems. Structure of the above systems will be covered at both the microscopic and macroscopic levels. Prereq: CHEM 403-404. Special fee. Lab. No credit if credit earned for ZOOL 507-508; ZOOL 518 and ZOOL 625. Not open to freshmen. 4 cr.

512. Anatomy and Physiology
Introduction to the principles of human structure and function. Includes molecular and cellular mechanisms of major processes (such as muscle contraction, neural transmission, and signal transduction) and systematic aspects of the nervous, cardiovascular, respiratory, endocrine, gastrointestinal, and renal systems. Structure of the above systems will be covered at both the microscopic and macroscopic levels. Prereq: CHEM 403-404. Special fee. Lab. No credit if credit earned for ZOOL 507-508; ZOOL 518 and ZOOL 625. Not open to freshmen. 4 cr.

520. Classical Dressage Experience in Portugal
Concentrated study of the Portuguese method of classical dressage at L’Escola de Equitação de Alcântara ‘N Alainca, Portugal. Affords students the opportunity to ride at a premier center for equestrian art with a master of classical dressage and to experience the culture of Portugal. Offers full immersion in dressage riding, teaching, and training. Trip takes place over Spring Break. Weekly seminar held prior to departure. Special fee. Prereq: ANSC 402: Horsemanship at 1-2 level or above. Permission required. 2 cr.

530. Dairy Cattle Diseases
Covers the principles of immune response, disease development, immunological basis for disease control, management practices to maintain animal health, and dairy cattle disease identification and prevention. 2 cr.

543. Technical Writing in Animal Sciences
Emphasis on writing scientific articles and articles for the end user on subjects pertaining to the animal science industry. Students are expected to make several oral presentations. Resume preparation is also included. Prereq: ENGL 401 or equivalent; permission. Writing intensive. 2 cr.

565. Principles of Horse Trials Management
Theory and hands-on involvement in the organizational process of managing an event competition. Topics will include budgeting, logistical needs, working with entries, sponsorship, awards, publicity, facilities management, course design and committee management. Students will actively participate in the management and preparation of the UNH Horse Trials, overseeing the committees working in the phases of the event and also performing other responsibilities. One credit, half semester course. (During the fall semester, the class will meet for the first half of the semester; during the spring semester, the class will meet for the second half of the semester.) 2 cr.

600/600W. Field Experience
A supervised experience providing the opportunity to apply academic experience in settings associated with future professional employment and/or related graduate opportunities. Must be approved by a faculty adviser selected by the student. May be repeated to a maximum of 8 credit hours. Permission of supervising faculty member required. Cr/F. 1 to 4 cr.

602. Animal Rights and Societal Issues
To explore all aspects of human-animal interaction and welfare, emphasizing social, ethical, biological, historical and economic aspects of animal care and use. (Juniors and seniors only.) Special fee. Writing intensive. 4 cr.

604. Equine Selection
Principles of selecting the performance sport horse with an analysis of conformation, gait, soundness, and pedigree. Breed improvement through applied genetics, heritability, stallion and mare selection and inherited abnormalities. An additional hour has been added totaling 4 contact hours. 4 cr.

605. Equine Business Management
Many of the careers equine science students aspire to are actually small businesses. Running a successful equine-related enterprise involves equine business planning, marketing, management and profitability, in addition to an equine science background. These concepts apply when developing a new equine business, expanding or refocusing a current equine business, and to those working as part of the management team of an existing equine business. This course will examine these underlying fundamentals. Students will also be involved in business planning for an equine business, evaluation and redirection recommendations for an existing equine business, case studies, role-plays. 4 cr.

607. Small Animal Diseases
Common diseases in companion animals; emphasis on canine and feline medicine. 2 cr.

609. Principles of Nutrition
Applied animal nutrition and nutrient metabolism. Prereq: one year of chemistry; one semester of physiology. 4 cr.

612. Genetics of Domestic Animals
Application of basic and molecular genetics to the diagnosis and control of inherited diseases of domestic animals and application of quantitative genetics for the improvement of economically important traits of farm animals. Prereq: BIOL 411 or permission. 4 cr.

615. Norwich Farm Dairy Internship
An internship on a commercial dairy farm allowing the student day-to-day management of a herd of Holstein cows health and management (animal and financial) are studied. Homework and monthly exams. Dairy Management majors only. Permission required. 14 cr.

620. Equine Diseases
Body-systems approach to the discussion of medical and surgical diseases affecting the horse. Prereq: ANSC 404. Coreq: ANSC 622. 2 cr.
622. Equine Disease Clinic
Evaluation techniques of the normal and abnormal horse using the University horse herd. Discussion of clinical cases within the herd. Prereq: ANSC 404; Coreq: ANSC 620. Special fee. 2 cr.

623. Comparative Histology
Introduction to microscopic anatomy of domestic animals tissues and body systems with reference to human, avian, fish, and marine mammals. Structure and function briefly correlated. Prereq: BIOL 411-412 and ANSC 511-512 or permission. Recommended for all premed, prevet, and premedical students. 4 cr.

625. Equine Sports Medicine and Lameness
Limitations of the healthy horse in athletic competition and the prevention and treatment of equine athletic injuries with heavy emphasis on the musculoskeletal system. Prereq: ANSC 404; ANSC 511-512; permission. Special fee. 4 cr.

640. Principles of Riding Instruction
Introduction to the principles, theory and practice of Riding Instruction. Includes discussion of styles of learning and instruction as applied to a riding environment, student assessment, skill acquisition, lesson planning, horse selection and principles of group and private riding instruction. Students will use lab time to observe, assist and practice teaching in sections of ANSC 402, which will be matched according to their abilities and interests. Students will prepare for ARIA licensing examinations as part of class. Fall semester only. Lab. Prereq: ANSC 402 at Intermediate 1 or above, or permission. 4 cr.

641. Principles of Dressage Instruction
Advanced principles and theory of dressage and advanced concepts in teaching and coaching dressage. Students will use lab time to observe, assist and practice teaching in dressage-only sections of ANSC 402. Students will prepare for ARIA licensing examinations as part of class. Spring semester only. Lab. Prereq: ANSC 640. 2 cr.

642. Principles of Jumping Instruction
Advanced principles and theory of jumping and advanced concepts in teaching and coaching over fences in the arena and cross-country. Students will use lab time to observe, assist and practice teaching in dressage-only sections of ANSC 402. Students will prepare for ARIA licensing examinations as part of class. Spring semester only. Lab. Prereq: ANSC 640. 2 cr.

643. Principles of Therapeutic Riding Instruction
Principles and theory of teaching therapeutic riding, including special considerations of teaching in a therapeutic environment and methods of instruction for individuals with a variety of disabilities. Lab consists of observing, assisting and practice-teaching in UNH Therapeutic Riding Program as preparation for NARHA instructor certification process. Spring semester only. Prereq: ANSC 640 and ANSC 500. 2 cr.

650. Dairy Industry Travel Course
Extended field trip to a variety of dairy farms and dairy related businesses in the Northeast with students and faculty from other New England land grants. Includes observation, discussion, case study, problem solving, and journal report. Prereq: permission. May be repeated to a maximum of 2 credits. 1 cr.

651. Biotechnology Experience/Biomanufacturing
Course begins by introducing the student to the proteins and companies of biotechnology and to current good manufacturing practices. Remainder of course students use cell culture of bacteria, mammalian and yeast cells to produce human proteins using the tools and manufacturing standards, operating procedures of biotechnology including upstream and downstream processing of proteins, and quality control of protein production. Prereq: BIOL 411-412; CHEM 403-404. (Also listed as MICR 651.) Permission required. 4 cr.

655. Biotechnology Experience/Research
Biotechnology Research Experience is one of two courses that provides students with state-of-the-art tools of biotechnology and an opportunity to master skills and acquire the knowledge needed to effectively work in a biotechnology lab within the industry. Research protocols used in this course illustrate aspects of the "central dogma" of molecular biology. Prereq: BIOL 411, 412, and MICR 503. (Also listed as MICR 655.) + cr.

694. Summer Cooperative for Real Education in Agricultural Management
SREAM (Summer Cooperative for Real Education in Agricultural Management) is a course in which students perform the work and make financial and management decisions associated with the CREAM dairy herd. Students assume complete responsibility for the management and care of the 25-cow herd for the entire summer. SREAM provides students with a unique experiential learning environment that will help them understand how to work together to manage and operate a small business, the decision-making skills required in production agriculture, and the application of science to the management of a dairy herd. Prereq: upper-class standing, permission. 4 cr.

695, 696. Supervised Teaching Experience
Participants are expected to perform such functions as leading discussion sections, directing and assisting in laboratories, and assisting students with their problems in courses that participants have completed successfully. Enrollment is limited to juniors and seniors who have a minimum 3.00 cumulative average. Prereq: permission of instructor and department chairperson. May be repeated up to a maximum of 4 credits. Cr/F. 1 to 2 cr.

697. Equine Seminar
Current equine industry issues, recent literature and research, and professional preparation. Offered to sophomores and juniors only. Cr/F. 1 cr.

698. Cooperative for Real Education in Agricultural Management (CREAM)
CREAM (Cooperative for Real Education in Agricultural Management) is a 2-semester course in which students perform the work and make the financial management decisions associated with the CREAM dairy herd. Students assume full responsibility for the management and care of the 25-cow herd for the entire academic year. CREAM provides students with a unique experiential learning model that will help them understand how to work together to manage and operate a small business, the decision-making skills required in production agriculture and the application of science to the management of a dairy herd. Permission. Two semesters are required. 4 cr.

701. Physiology of Reproduction
Comparative aspects of embryology, anatomy, endocrinology, and physiology of reproduction. Special fee. Lab. 4 cr.

702/702W. Endocrinology
Biochemical and molecular structure and function of vertebrate endocrine systems. Influence of endocrine system on the physiology of vertebrates, with special reference to mammals. Current investigations of the endocrine system as a regulator and integrator of body functions including such systems as growth, reproduction, metabolism, differentiation, and behavior. (Also offered as BCHM 702.) Prereq: BCHM 658 or 751/permission. Special fee. 4 cr. 702W is writing intensive.

704. Principles of Pathobiology
Principles and mechanisms of disease at the cellular and tissue levels, including responses to cell injury, death and adaptation, inflammation, circulatory disturbances, disorders of the immune system, and neoplasia. Prereq: ANSC 511/512 or permission. 4 cr.

705. Veterinary Microbiology and Zoonotic Disease
Clinical microbiological techniques using veterinary medical specimens. Along with the isolation and identification of bacterial, fungal, and parasitic pathogens, the zoonotic potential of a variety of organisms is discussed. Prereq: permission of instructor. 2 cr.

706. Human Genetics
The genetic basis of human traits and diseases. New understanding added by molecular genetic approaches. Human genome project, gene therapy. Discussion of genetic components of quantitative and behavioral traits in human evolution. Prereq: BIOL 604 or ANSC 612. (Also offered as GEN 706.) (Not offered every year.) 3 cr.

707. Veterinary Histology Techniques
Routine histologic techniques including tissue trimming, processing, sectioning, routine and specialized staining, lab safety, and troubleshooting skills are taught through small group discussions, demonstrations, and hands-on training. Prereq: permission of instructor. 2 cr.

708. Ruminology
Anatomy of the ruminant gastrointestinal tract, physiological factors related to rumen function, and microbial metabolism of carbohydrates, protein, and lipids. Prereq: MICR 503 or equivalent. 2 cr.

710. Dairy Nutrition
Feeding management of dairy cattle. Emphasis on feedstuff, nutritional requirements, and diet formulation for efficient production and optimum health. Prereq: ANSC 609 or 750; permission. 4 cr.

714. Research Methods in Endocrinology
Principles of biomedical, cellular, and molecular techniques and their applications to research in the endocrine system. Techniques include protein and nucleic acid assays, thin layer chromatography, radioimmunoassay, enzyme-linked immunosorbent assay, agarose and polyacrylamide gel electrophoresis, transfection, restriction analysis, plasmid amplification, RNA extraction, and dot-blot hybridization. Prereq: ANSC 701 or BCHM 658 or ANSC 702/BCHM 702; permission. Special fee. Lab. Writing intensive. 5 cr.

715. Physiology of Lactation
Examines the biological and biochemical influences of the lactation process. Emphasis on the physiological effects of environments, hormones, and nutrition on milk synthesis and secretion, mammary physiology, and maternal response. Prereq: ANSC 701, permission. 4 cr.
718. Mammalian Physiology
Advanced study of the systems that control mammalian functions with emphasis on cellular and molecular mechanisms. Includes the nervous, muscular, cardiovascular, renal, gastrointestinal, and endocrine systems. Prereq: ANSC 511-512; ZOOL 627, and one semester of biochemistry or permission. Writing intensive. 4 cr.

724. Reproductive Management and Artificial Insemination
Focuses on goals and fundamentals of reproductive management of horses, dairy and livestock animals, and through actual experience, development of competency in performing modern breeding techniques for equine and bovine reproduction. Prereq: ANSC 701; permission. Special fee. Lab. 4 cr.

723. Nutritional Biochemistry
Detailed analysis of the digestion, absorption, transport and intermediary metabolism of nutrients. Nutrient requirements are evaluated in the context of their physiological and biochemical functions. Prereq: ANSC 511-512; BCHM 658, or equivalents. (Also offered as NUTR 750.) Fall semester only. Writing intensive. 4 cr.

750. Cell Culture
Principles and technical skills fundamental to the culture of animal and plant cells, tissues, and organs. Introduction to the techniques of subculturing, establishing primary cultures, karyotyping, serum testing, cloning, growth curves, cryopreservation, hybridoma formation and monoclonal antibody production, and organ cultures. An interdisciplinary course with emphasis on the application of cell culture to contemporary research in the biological sciences. Prereq: ANSC 511-512; BCHM 658, or equivalents. (Also offered as NUTR 750.) Fall semester only. Writing intensive. 4 cr.

754. Molecular Diagnostics
To introduce advanced undergraduate and graduate students in chemistry, biochemistry, molecular biology, medical laboratory science, physics, and engineering to the basic concepts and principles of biotechnology-based diagnostic and detection methods. These include immunoassay, nucleic acid probes, biosensors, and microarrays. Also introduces advanced students to the basic concepts of applied R & D and product development. Provides a fundamental understanding of biotechnology-based diagnostic methods and the basic steps necessary to develop a product based on a laboratory concept. 4 cr.

#760. Geriatric Nutrition
Emphasis on the nutritional requirements and status of the elderly in view of psychological and physiological changes in aging. Approaches for nutrition intervention and support will be addressed. Prereq: NUTR 400 or permission. (Also offered as NUTR 760.) Cr/F. Summer session only. 3 cr.

795/795W. Investments
Investigations in genetics, nutrition, management, diseases, histology, equestrian management/agri-business, physiology, cell biology, microbiology, dairy management, or teaching experience. May be repeated. Prereq: permission. 1 to 4 cr.

799. Honors Senior Thesis
Independent research culminating with a written honors thesis in A) Genetics; B) Nutrition; C) Management; D) Diseases; E) Histology; F) Light Horsemanship; G) Physiology; H) Cell Biology; I) Microbiology; J) Dairy Management. May be repeated. Prereq: permission. IA. Writing intensive. 1 to 4 cr.

Anthropology (ANTH)
(For program description, see page 30.)

411/411H/411W. Global Perspectives on the Human Condition: An Introduction to Anthropology
By providing a global perspective on the human experience, this course helps us think about the issues that confront students as citizens of the world. Gleaming lessons from cultures past and present this course examines what it means to be human. Whether humans are violent or peace-loving, egalitarian or hierarchical is linked to specific ways of life, rather than reflecting a fixed human nature. The course examines the economic, political, and social forces that shape human behavior and the global forces that people around the world currently confront. From an anthropological perspective it addresses pressing social issues such as sustainable development, hunger and poverty, population growth, religion and changing world views, racism, urbanization, commodification, and movements for social commodification, and movements for social justice. 4 cr. 411H and 411W are writing intensive.

412. Broken Pots and Buried Cities: Adventures in Archaeology
Traces the history of archaeology’s most spectacular finds and how those moments of adventure and discovery developed into a scientific discipline. Provides an introduction to the methods used by archaeologists to recover, analyze, and interpret data in their ongoing effort to understand human society through the analysis of those small things left behind. 4 cr.

413. Monkeys, Apes, Stones, and Bones: Introduction to Physical Anthropology
Archaeology
An introduction to physical anthropology. Deals with the historical and comparative biology of humans, looking at humans as members of the animal kingdom, focusing on the attributes shared with our primate relatives, and the origins of uniquely human attributes. Using the approaches of biological anthropology (and archaeology), the course traces human physical and cultural development from its earliest beginning, more than five million years ago, to about 15,000 years ago, just before the beginnings of plant and animal domestication and the rise of complex societies. 4 cr.

450. Introduction to Race, Culture, and Power
Race, culture, and power intersect at a social space where those in that space experience differing opportunities and access to social and economic privileges, resources, and power. This course explores the way race functions today as a social and cultural category to justify systemic inequality and differences in power and to obscure the functioning of the global economy. The course draws on emerging literature on Blackness, Whiteness, and Minorities and on analyses of the differential implementation of social welfare policies in the United States. (Also listed as INCO 450.) 4 cr.

500/500W. Peoples and Cultures of the World
A) North America; B) South America; C) Middle East and North Africa; D) Sub-Saharan Africa; E) South Asia; F) Southeast Asia; G) Oceania; I) Caribbean; Z) Other. Characteristic ecological, historical, and sociocultural factors in the major ethnographic regions of the globe. Analysis of structural differences and similarities among societies. Offered in the following sections as staff is available and student needs dictate. North America: Study of the economies, history, religion, art, and ideas of North American Indians from precolonial times to the present. South America: A survey of the indigenous cultures and selected studies of the relationship between environment and culture. Changes in culture and social organizations since the 16th century will be considered where historical data permit. Middle East and North Africa: The role of ecological, social, cultural, and historical factors in shaping Middle Eastern and North African cultures today. Special attention will be paid to family, values, and religion; to nomadic, village, and urban ways of life; and to issues of unity, diversity, colonialism, and culture change. Sub-Saharan Africa: Study of Sub-Saharan economy, society, and culture from precolonial times to the present. South Asia: Emphasis on India, Sri Lanka, and Nepal. Traditional and changing South African cultures, including caste, family, economy, and religious movements for social commodification, and movements for social commodity, and movement for social justice. 4 cr. 500/500W is writing intensive.

501. World Prehistory
A) North America; B) Mesoamerica; C) South America; D) Near East; E) Other. The development of prehistoric cultures in various areas of the world. Offered in the following sections as staff is available and student needs dictate. North America: Archaeology of the Indians north of Mexico; and early evidence of settlement to European contact. Diversity of cultures from ecological and evolutionary perspectives. Emphasis on the Eastern Woodlands, the Plains, and the Southwest. Mesoamerica: Cultural development from earliest cultures through the Spanish conquest. Emphasis on origins of agriculture and rise of Olmec, Teotihuacan, Mayan, Toltec, and Aztec civilizations. Stress on factors critical to the development of complex societies. South America: Cultural development from earliest migrations through Inca Empire. Focus on major regions of South America. Consideration of Intermediate
Area, Amazon Basin, and Central Andes as core regions for foundations of civilization. Near East: From earliest cultures to the development of agriculture and settled village life. Examines the processes that gave rise to the world's first civilizations. 4 cr.

511. Core Concepts in Anthropology
This course introduces students to the core concepts and paradigms of contemporary anthropology. Students will learn how anthropology approaches the study of family, kinship, community, gender, economic relationships, political systems, religion, social change and globalization. Ethnographic material from a variety of cultures will illustrate the concepts of social structure and the cultural construction of categories such as race and ethnicity. Foundation course required of anthropology majors in first year of declaring their major. Writing intensive. 4 cr.

512. Introduction to World Ethnography
Primarily for major and minors, but open to all students. Historical and geographic factors, types of social and economic organization, and problems involved in the comparative study of human societies and institutions. Analysis of selected peoples in the major ethnographic areas. 4 cr.

514. Method and Theory in Archaeology
Basic method and theory; techniques in recovering and interpreting data; laboratory exercises in ceramic and lithic analysis. Critical evaluation of archaeological literature. Prereq: ANTH 412 or permission. 4 cr.

515. Anthropology and Contemporary Issues
Anthropological approaches to current world issues such as racism, poverty, religious movements, revolution, and environmental stress. Selected topics examined in the context of both western and non-western perspectives. 4 cr.

516. Kinship and Social Organization
The significance of kin and non-kin relations in human societies. Topics include the origins and evolution of human society, variations in the form and functions of marriage, family, and kin-based groups and selected non-kin relationships. Primary focus will be on non-industrial societies. Prereq: ANTH 411 or permission. 4 cr.

517. Critical Reading and Writing in Anthropology
Basic skills of reading, writing, and analysis essential to the study of anthropology. Focus on learning to recognize, compare, and evaluate critically the central arguments of several major books drawn from different subfields and orientations in anthropology. Small class size for extensive discussion and feedback. Prereq: ANTH 411 or 412, or permission. Writing intensive. 4 cr.

520. Anthropology of Migration
The question of immigration, an issue of great concern throughout the world, is addressed along with the movement of people as a historical, economic, and cultural process. Life experiences of people in motion are examined. Using case studies, past and present migrations are compared. The racial, ethnic, and national identities of migrants are explored. Distinctions between immigrants, refugees, sojourners, internal and international migration, and legal and undocumented migrants, as well as the history and current status of attacks on immigrants are critiqued. While most of the course material is drawn from the U.S. experience, the perspective on migration is global. 4 cr.

597. Special Topics
Occasional and experimental offerings on an entry level. May be repeated for different topics. 4 cr.

601. Topics in Popular Culture
This course explores the anthropology of popular culture using film, novels, and other media as well as widely disseminated texts. The course focuses on myths about culture and human behavior which become part of the global cultural mainstream, and counterposes popular stereotypes with data from cultural anthropology and archaeology. A) Native Americans and Popular Culture B) Archaeology and Popular Culture C) Popular Culture and Physical Anthropology D) Poverty and Popular Culture E) Gender and Popular Culture F) Other. May be repeated but not in duplicate areas. 4 cr.

610. Medical Anthropology: Illness and Healing
How we, as humans define sickness and health, our theories of who or what made us ill, our approach to biological processes from birth to death and our search for cures have varied through history and from culture to culture. This course provides an overview of illness and healing beliefs and practices in different cultures both around the world and in the United States. The course examines the practices and belief systems of healers, voodoo priestesses, midwives, Taos priests, psychiatrists and medical doctors through the same analytical lens. 4 cr.

614. Economy, Culture, and Society
This course explores the different ways that humans have earned their livelihood, from foraging and agriculture to industrial capitalism. Emphasis is placed on the social and cultural correlates of different economic strategies, with particular attention to the consequences of the spread of capitalism. Consideration is given to issues of equality, gender, sustainability, and the utility and limits of a "globalization" perspective. Prereq: ANTH 411 and ANTH 511, or permission. Writing intensive. 4 cr.

616. Religion, Culture, and Society
Major anthropological theories of religion; analysis of religious beliefs as symbolic systems and their interactions with ritual and other social institutions. Detailed study of specific religions. Writing intensive. 4 cr.

617. Religion, Culture, and Conflict in South Asia
Explores connections between religion and violent conflict in South Asia. Includes overviews of three great religious traditions of the region. Buddhism, Hinduism, and Islam, and how they are realized in the daily lives of South Asian practitioners. Ethnographic case studies of religious violence, coupled with readings in contemporary theory, to understand how and why violence is produced by considering not only religious belief and practice but also such factors as colonialism, postcolonial politics, the social processes of contemporary Diaspora, economic structure and change, and international religious movements. Prereq: at least sophomore standing. Anthropology or religious studies background recommended. (Also offered as RS 617.) Writing intensive. 4 cr.

618. Political Anthropology
Political processes and structures in no industrial societies. Major topics: centralization of power and authority, legal systems, and warfare. Prereq: ANTH 411 or permission. 4 cr.

625. Female, Male, and Society
Critical, cross-cultural study of sex-related behavior in historical as well as contemporary perspective. Draws on anthropological, social- psychological, and sociological literature. (Also offered as SOC 625.) 4 cr.

627. Urbanization in Africa
Explores the process of urbanization and describes the creation of urban culture in sub-Saharan Africa by investigating the effects of urbanization on socio-economic and cultural conditions. An attempt is made throughout the course to study urbanization and urban life within the context of broader societal, economic, cultural, and political relations in order to understand the dynamics inherent in these processes. Urbanization is discussed in the course of colonialism, post-colonialism, and other social relations of dependency that continue to shape urban life and urban-rural relations. 4 cr.

650. Discovery Guatemala, Archaeology Semester Abroad
Field and laboratory methods in archaeology. Emphasis on excavation techniques and data analysis as related to project research design. Includes practical experience in lab as well as field. Prereq: permission. Special fee. 12 cr.

670. Language and Culture
Investigates the relationship between language and culture and how their interpretation produces meaning. Special attention to the issues of class, gender, and ethnicity and the ways in which inequality is maintained through culturally patterned speech styles and associated prejudices. Speech communities in the United States are emphasized. 4 cr.

680. Globalization, Development, and Poverty
This course considers the phenomena of globalization, a term that has come into use since the 1980s to describe the ever-intensifying networks of cross-border human interaction which increasingly tie the world together. Tracing the relationship between the increasing interconnectedness of the world, the processes of economic development and world poverty, the course demonstrates that the consequences of globalization are neither the same nor positive in every country. Through the use of case studies of different development processes, students gain an understanding of why and how globalization is creating differential effects in different parts of the world. This course is the first course of a suggested two course sequence, ANTH 680 and ANTH 780. 4 cr.

685. Gender, Sexuality and HIV/AIDS in Sub-Saharan Africa
AIDS is spreading rapidly in sub-Saharan Africa. Course explores the factors that are behind this rapid transmission, including poverty, gender inequality, culture and sexuality. Writing intensive. 4 cr.

690. Ethnographic Field Research
Explores history, theory, and practice of ethnographic research. Students read and practice such techniques as mapping, taking life histories, compiling genealogies, and analyzing use of space, language, and rituals. Each student also carries out and writes up an independent research project. Prereq: ANTH 411 or SOC 400; one 500-level or higher anthropology or sociology course; or permission. No credit for students who have completed ANTH 630. Writing intensive. 4 cr.
697. Special Topics
Occasional or experimental offerings. May be repeated for different topics. Prereq: ANTH 411 or permission. Writing intensive. 4 cr.

#698. Folklore and Folklife
Examines the materials and methods used to study folklore and folklife, emphasizing the historical context and development of folklore studies in North America and Europe, field research, performance theory, and other topics. (Also offered as ENGL 732.) 4 cr.

699. Senior Thesis
Independent work in the library or field; recommended for, but not limited to, majors intending to pursue graduate studies; required for honors candidates. Contact staff to obtain approval and arrange supervision prior to senior year. 4 or 8 credit 2 semesters, 8 credits required for honors; an A grade (continuous course) given at end of first semester. 4 or 8 cr.

700. Internship
Provides student with supervised practical experience in anthropology in one of the following areas: A) professional or community support work within an academic or applied anthropology setting; B) teaching; C) museum work; D) archaeological laboratory or fieldwork; E) research on a faculty research project; F) editorial work on a journal or faculty book project. May be repeated up to 8 credits. Prereq: permission. 1 to 4 cr.

701. History of Anthropological Theory
Reading and discussion of the works of major theoreticians of American, British, and French schools. Selections from the works of Spencer, Morgan, Tylor, Boas, Kroeber, Lourie, Steward, White, Durkheim, Mauss, Levi-Strauss, Malinowski, Radcliffe-Brown, Evans-Pritchard, and others are treated in terms of their contributions to the historical development of anthropology and their relevance to contemporary debates in anthropological theory. Prereq: ANTH 511. 4 cr.

702. Issues in Contemporary Anthropological Theory
Explores such recent directions in the discipline as cognitive/symbolic anthropology, cultural materialism, evolutionary theory, gender studies, interpretive anthropology, political economy, practice theory, and structuralism. Prereq: ANTH 701 or permission. 4 cr.

705. Topics in Mesoamerican Anthropology
Examines the very origins of civilization in the New World by first focusing on the domestication of staple food crops and the development of inequality and carefully tracing the ever increasing socio-political complexity displayed by early Mesoamerican peoples. Includes the successive rises of Olmec, Teotihuacan, Zapotec, and Preclassic Maya and Teotihuacan in an effort to understand the mechanisms driving the development of agricultural intensification, economic specialization, long-distance trade networks, and the institution of divine kingship. 4 cr.

#710. Youth, Culture, and Society in Comparative Perspective
This course examines lifestyles, social identities, and subcultures of youth in a variety of cultural and historical settings. Students will develop an understanding of the conditions that foster the formation of social identity and the emergence of age-based subcultures. The course explores the relationship between individual and social identity, and between youth subcultures and dominant cultural systems. (Also listed as EDUC 711.) 4 cr.

#715. Global Warring
Examines warfare in societies with and without the state. It explores different theoretical perspectives concerning war, rejecting biological approaches in favor of the one that stresses logics of power. This latter position suggests that human societies have their cultural, economic, and political institutions; that these when inter-connected are structures of power called complexes; and that the ‘logics’ of complexes—how they act—explain war. Specifically, it is argued that a “military-capitalist” complex evolved during the making of the modern state, one of whose logics led to global warring in the interests of powerful capitalist actors and their allies in political and cultural institutions. Prereq: ANTH 411 or 511, and at least two other courses in social sciences or history or by permission of professor. 4 cr.

720. Roots and Routes: Migration and Globalization
Migrations are changing the nature of national identities, cultures, and concepts of citizenship. Many migrants live their lives across borders, keeping their homeland identities while becoming significant actors in their new lands. At the same time, people who are the descendants of immigrants are exploring their family genealogies and discovering their roots. In this course we ask why migration is a global phenomenon, who is moving, and why. The course compares the new migrations and life experiences of migrants to the migration of the previous few centuries as a way of highlighting the nature of contemporary migration and globalization. We link migration to disparities of wealth and power within and between states. Prereq: sophomore level, ANTH 411 or an introductory-level course in social science or history. 4 cr.

760. Race in Global Perspectives
The concept of race developed to justify European Colonialism. Race, because it is a relationship of power, has emerged as a form of transnational identification which unites people in common struggle for social justice. Using history, ethnography, novels, and films, this advanced seminar looks at the development and deployment of concepts of race in different situations of inequality around the world. Possible topics include the black Atlantic, Pan-Africanism, First People identity, whiteness, Orientalism, mestisaje, and anthropological treatments of Jewish identity. Prereq: INCO 450 or ANTH 450; introduction to race, culture, and power. Writing intensive. 4 cr.

770. Culture, Personality, and Society
Examines narratives of the sinister—stories about witches, demons, vampires, extraterrestrials, and so on—that are told as if true, and the cultural, political, and economic contexts of their production. Variations in the sinister are compared across culturally and trans-culturally. Links between a recent worldwide upsurge in narratives of the sinister and the processes of globalization and modernity are emphasized. Operates on a seminar format; open only to juniors and seniors. (Also listed as RS 770.) 4 cr.

780. Anthropology of Globalization
The central question of the Anthropology of Globalization is the following: “What is happening to the life ways of people and identities around the world as a result of contemporary globalization and why?” To answer this question we begin the course by exploring the global processes behind images of untouched cultures presented through tourism. We explore contemporary commodification of culture. This course develops a definition of globalization by examining the relationship between contemporary and past periods and processes of globalization, reviewing the ways in which cultures and identities were constructed through processes of globalization. We include in our exploration changing values, social relationships, racial, ethnic, and national identities, gender constructions, and the nature of social protest. Juniors and seniors only. (Students are encouraged to first complete ANTH 680, Globalization, Development, and Poverty.) Writing intensive. 4 cr.

795, 796. Reading and Research
A) Cultural/Social Anthropology; B) Anthropological Linguistics; C) Archaeology; D) Physical Anthropology. Prereq: 12 credits of anthropology; permission. 1 to 8 cr.

797. Advanced Topics
Advanced or specialized courses presenting material not normally covered in regular course offerings. May be repeated, but not in duplicate areas. College approval on file in the department office during registration. A) Social Organization; B) Economic Anthropology; C) Anthropology of Religion; D) Political Anthropology; E) Social Impact Analysis; F) Cultural Ecology; G) Prehistoric Archaeology; H) Historic Archaeology; J) Cultural Resources Conservation; J) Lithic Analysis; K) Ceramic Analysis; L) Faunal Analysis; M) Human Evolution; N) Human Variations; O) Anthropological Theory. Prereq: ANTH 411 or 412 (as appropriate) or permission. 4 cr.

Art & Art History (ARTS)
(For program description, see page 30.)

444. Mona Lisa to Romeo and Juliet: An Introduction to Renaissance Culture
What made Renaissance culture tick: who were the pivotal personalities (writers and politicians as well as artists); which are the most typical and which the least typical works produced in Italy and elsewhere throughout Europe? How did viewers think about the art of their time, and in particular how did they respond to the new mass medium of printed images? How connected is our present artistic culture to that of five hundred years ago? When did the Renaissance acquire its fame? Students consider connections between the English and the Italian Renaissances, comparing, for instance, Michelangelo and Shakespeare. Readings include sixteenth-century historical and literary sources as well as art historical essays. Writing intensive. 4 cr.

455. Introduction to Architecture
Study of architectural graphics, design theories, form determinants, and the architect in society. Includes case study projects. Lab. 4 cr.

480. Introduction to Art History
Analysis of the central forms and meanings of art history through intensive study of selected artists and monuments. Includes works of architecture, sculpture, painting, and the graphic arts. Topics will vary but might include the Parthenon, Chartres Cathedral, Michelangelo’s Sistine Chapel ceiling, Rembrandt’s self-portraits, Monet’s landscapes, Picasso’s Guernica, Frank Lloyd Wright’s Fallingwater, Georgia O’Keeffe’s abstractions, ukio-e prints, and Benin sculpture. Writing intensive. 4 cr.

ANTHROPOLOGY, ART & ART HISTORY
571. Art of the Middle Ages
Architecture, sculpture, and painting in medieval Europe. Beginning with Early Christian art, the course examines the interplay between classical traditions and the more abstract forms and ideas that emerged at the end of the Roman Empire and then flourished in Byzantine and early medieval art. Special attention to the development of the Romanesque and Gothic forms and meanings in the high medieval civilization of the 12th and 13th centuries. 4 cr.

572. Art of the Age of Humanism
European painting, sculpture, and architecture from the 15th to the 17th centuries. The course focuses on the revolutionary character of early Renaissance art in Italy and the Netherlands and the heroic age of High Renaissance classicism that followed around 1500. Examines the subsequent crisis of 16th-century Mannerism and realism, and the ruptures and continuities underlying the diverse forms and meanings of Baroque art in the following century. 4 cr.

573. Art of the Modern World
Painting, sculpture, and architecture in Europe and America from the French Revolution to the present. Surveys the rapidly changing currents and countercurrents in modern art, including Neo-classicism and Romanticism, Realism and Impressionism, the Cubist revolution, and various forms of 20th century abstraction. In addition to the individual artists and movements, discussion of the cultural upheavals that have driven modernism’s pervasive sense of crisis and pursuit of the “new.” 4 cr.

574. Architectural History
A survey of the chief and representative buildings from the entire history of architecture. Analysis of buildings with regard to structure, form, and symbolic content, concentrating on major works such as the pyramids, the Roman Pantheon, the Gothic cathedral, the Renaissance palace, the Baroque church, and the modern skyscraper. Writing intensive. 4 cr.

580. History of Art to 1400
A chronologically and geographically broad introduction to the history of art and architecture and the discipline of art history. The first semester of the two-semester sequence ranges from the Ancient World to the Renaissance. Writing intensive. 4 cr.

581. History of Art from 1400 to the Present
A chronologically and geographically broad introduction to the history of art and architecture and to the discipline of art history. The second semester of the two-semester sequence ranges from the Renaissance to the present. ARTS 580 is recommended as preparation for, but is not a formal prerequisite for 581. Writing intensive. 4 cr.

585. History of Islamic Art
This course examines the main monuments and issues in the history of Islamic art. It is intended as a general introduction to the field and no prior knowledge is required. Although the course focuses on the period between the rise of Islam and the Mongol invasions, students will be encouraged to examine later periods of Islamic art in their papers. Particular attention will be paid to patronage, form, and legislation of pilgrimage sites, and other forms of sacred architecture. (Also offered as HIST 600.) 4 cr.

598. Sophomore Seminar
Encourages experimentation by integrating verbal and nonverbal modes of expression through readings, discussions, studio work. Field trips. Prereq: two art history courses and two studio arts courses. 4 cr.

600. Internship
Elective to take an internship in the following areas within the Department of Art and Art History: (600A) Painting, Drawing, Printmaking, Photography, Sculpture, Woodworking, Ceramics, and Graphic Design; (600B) Art History; (600C) Architecture; and (600D) Museum Work. Cannot be used to satisfy one of three electives in the Studio B.F.A. Program and one of the two electives in the Studio B.A. Program. In art history, it can be taken as an elective above the 11-course major requirement. May be repeated up to 8 credits. Prereq: permission. 1 to 4 cr.

601. Ceramics Workshop
Application of new ceramic materials and techniques, with emphasis on ideas and their expression through form and content. Experimentation encouraged. May be repeated for a maximum of 12 credits. Prereq: ARTS 501. Special fee. Lab. 4 cr.

608. Arts and American Society: Women Writers and Artists, 1850-Present
Team-taught course studying the impact of gender definitions on the lives and works of selected American artists. Considers lesser-known figures such as Fannie Fern, Lily Martin Spencer, and Mary Hallock Foote, as well as better-known artists such as Willa Cather and Georgia O’Keeffe. Prereq: permission or one of the following: WS 401, HIST 566, ENGL 585, 586, 685, 785, or a 600-level art history course. (Also offered as AMST 608, ENGL 608, HIST 608, and HUMA 608.) Studio art majors who take this course for major credit will not receive major credit for ARTS 610. Writing intensive. 4 cr.

625. Wood/Furniture Design Workshop
Design and construction of the major furniture forms, using a broad range of techniques (including lamination, bending, and molding) to execute a series of concept areas relevant to furniture. May be repeated for a maximum of 12 credits. Prereq: ARTS 525. Special fee. Lab. 4 cr.

632. Intermediate Drawing
Focuses on three major topics: 1) linear perspective, 2) anatomical and/or structural aspects of the human figure, and 3) special materials (painterly and/or mixed media). Outside assignments encourage original thinking about image making. Prereq: ARTS 532. Lab. 4 cr.

633. Life Drawing
A continuation of the more formal aesthetic issues introduced in introductory and intermediate drawing with an emphasis on drawing the human figure from life. Prereq: ARTS 632. Lab. 4 cr.

636. Printmaking Workshop
Emphasis on development of the individual’s imagery in printmaking and/or intaglio, including an introduction to multicolor printmaking. May be repeated for a maximum of 12 credits. Prereq: ARTS 536 and/or ARTS 537. Lab. 4 cr.

645. Water Media II
Continuation of ARTS 544; introduction to other water-based media. Prereq: ARTS 544. Lab. 4 cr.

646. Intermediate Painting
More complex issues of the visual language. Still life and the figure continue as dominant subject matter. Slide lectures. May be repeated for a maximum of 8 credits. Prereq: ARTS 546. Lab. 4 cr.
651. Photography Workshop
Individualized projects involving creative methods, including color, manipulative, and documentary techniques. Students provide their own cameras. Prereq: ARTS 551. May be repeated for a maximum of 12 credits. Lab. Special fee. 4 cr.

654. 17th and 18th Century American Architecture
Chief architectural styles and significant buildings from the European colonization to the birth of the American republic. A study of religious, public, and domestic architecture and of the settlement patterns of the Spanish, French, Dutch, and English colonies, culminating in the revolutionary classicism of the new republic. Typical works include the California mission church, the New Orleans raised cottage, the Dutch farm house of the Hudson Valley, the plantations of Virginia, and the Boston State House. Field trips. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

655. Early Modern Architecture: Revolution to World War I
Chief architectural styles and significant buildings in Europe and America from the visionary Neoclassicists of the late eighteenth century and the restoration styles of the Victorian era to the birth and proliferation of the skyscraper. A study of the religious, public, commercial, and domestic architecture and of town planning during the rise of the modern nation-state and market capitalism. Typical works include the University of Virginia campus, the Houses of Parliament, the Eiffel Tower, the Chicago skyscraper, and the Frank Lloyd Wright buildings. Writing intensive. 4 cr.

656. Contemporary Architecture: The Buildings of Our Times
Chief architectural styles and significant buildings in Europe and America from the International Style and Frank Lloyd Wright to the post-modern and contemporary study of 20th century religious, public, commercial, and domestic architecture and of town planning that emphasizes the important formal, technological, and theoretical developments of high modernism and its aftermath. Typical works include the Bauhaus, Wright’s Fallingwater, Le Corbusier’s visionary town plans, the Air Force Academy, and Frank Gehry’s Guggenheim Museum in Bilbao. Field trips. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

667. Egyptian and Nubian Art: Architecture, Art, and Rediscovery
An examination of the art and architecture of Egypt and Nubia from the ancient, Christian, and Islamic periods to the modern era. Specific topics include: Egyptian religion and the major funerary complexes of the pharaohs; art and culture in Nubia; Egypt under the Ptolemies and the Romans, Christian monastic reform and the Copts; the spread of Islam under the Fatimids and Mamluks; travelers and archaeologists in the nineteenth century. Through field trips, the course will take advantage of the extensive collection of Egyptian art at the Museum of Fine Arts in Boston, as well as the collections of Coptic and Islamic art at the Harvard University Art Museums in Cambridge, Mass. Writing intensive. 4 cr.

674. Greek Art
Greek art and architecture from the Bronze Age civilizations of Minoan Crete and Mycenaean Greece to the late classical period of the 4th century B.C. Emphasis on the interplay of narrative and abstraction in the development of a distinctively Greek aesthetic consciousness, on the forms of art and thought in the Archaic Period, and on the flowering of the classical style in the 5th century B.C. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

675. Roman Art
Art and architecture in the ancient Mediterranean world from Alexander the Great to the fall of the Roman Empire. Emphasis on the interplay between the Greek and Etruscan traditions between public and private in Roman life and art, and the breakdown of classical ideals in the late empire. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

676. History of Illuminated Manuscripts
During the Middle Ages manuscripts were the primary locus of the painting tradition. After a consideration of the development of the manuscript book and our method of study, this course will consider the major works of manuscript illumination and their painted cycles of miniatures. Such important works as the Book of Kells, the Winchester Bible, the Psalter of St. Louis, and the Tres Riches Heures of Jean de Berry are considered in their cultural and historical contexts. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

677. Early Medieval Art
Development of Christian art from 300 to 1000 A.D. Study of the formulation of a new visual language via the intersection of Mediterranean and northern European traditions. Major focus on early Christian catacombs, Byzantine mosaics, insular manuscripts, and Carolingian imperial art. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

678. Romanesque and Gothic Art
The culmination of medieval artistic development through examination of major architectural monuments and their sculptural programs, as well as important centers of manuscript illumination. The period from the year 1000 A.D. through the beginnings of the Renaissance in the early 15th century will be stressed. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

679. Northern Renaissance Art I
Painting, sculpture, graphic arts, and manuscript illumination in France, Germany, and the Netherlands in the 14th and 15th centuries. Emphasis on the development of the traditions of Northern naturalism and the emergence in 15th-century Flanders of a distinct Renaissance consciousness, which runs parallel to contemporary trends in Italy. Major works include the Limbourg brothers, Claus Slater, Jan van Eyck, and Hugo van der Goes. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

867. Neo-Classicism to Romanticism
European painting and sculpture in its socio-political context, with emphasis on the relation of idea to image, from David and the French Revolution to the romantic landscapes of Friedrich and Runge, and the romantic-classic debate involving Delacroix and Ingres. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

868. Realism and Impressionism
Focus on the political, cultural, and physical changes in Paris in the second half of the 19th century and their relation to Impressionism. Work of Courbet, Millet, Monet, Manet, Degas, Cassatt, Morisot, Renoir, Cezanne, van Gogh, Seurat, and others examined in the context of the rise of landscape painting and the establishment of the Romantic manifestation of art made with an elite but relatively broad class of collectors in mind, and—in different examples—the first art that could be owned even by the poor. Examination of anonymous works, works by artists famous only as printmakers, and the printed work by or after Mantenga, Durer, Lucas van Leyden, Raphael, Michelangelo, Bruegel, and Rembrandt, as well as drawings of the period. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

Reformation. Major figures include Bosch, Durer, Holbein, and Bruegel. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

861. Early Renaissance Art in Italy
Painting, sculpture, and architecture in Italy during the 14th and 15th centuries. The emergence of Renaissance style in the art of such masters as Giotto, Masaccio, Donatello, Bellini, and Piero della Francesca. Attention is also given to the broad cultural developments to which they belong. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

862. High Renaissance and Mannerist Art in Italy
Continuation of ARTS 681. Primary focus on the formation of High Renaissance classicism in the art of Leonardo, Michelangelo, Raphael, Bramante, and Titian. Attention is also given to the subsequent crisis of the classical ideal in 16th-century mannerism. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

863. Baroque Art in Southern Europe
Painting, sculpture, and architecture in Italy, France, and Spain during the 17th century. Emphasis on the diverse and innovative character of art in this period of crisis between the Renaissance and the modern era. Intensive analysis of the works of such major masters as Bernini, Caravaggio, Poussin, and Velazquez. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

864. Baroque Art in Northern Europe
Dutch and Flemish painting in the 17th century. Examination of such major figures as Rubens, Rembrandt, Van Dyck, and Vermeer. Attention is also given to the development of the genres and the many little masters who practiced them. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

865. Graphic Art of the Renaissance and Baroque Periods
The availability of paper and the invention of the printing press made it possible for drawings and prints to become fundamental elements in the western artistic tradition. Prints have been called major instigators of the production of secular art and the rise of experimental art. They were the first art made with an elite but relatively broad class of collectors in mind, and—in different examples—the first art that could be owned even by the poor. Examination of anonymous works, works by artists famous only as printmakers, and the printed work by or after Mantenga, Durer, Lucas van Leyden, Raphael, Michelangelo, Bruegel, and Rembrandt, as well as drawings of the period. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.
ART & ART HISTORY

avant-garde in the visual arts. Concentration on the great collections of the Harvard University Art Museums and the Boston Museum Fine Arts. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

688. 20th Century Art I
An examination of European and American art from symbolism to surrealism. Focuses on art and theory from the 1890s to World War II in relation to the political, social, and scientific upheavals of the era. Particular emphasis will be placed on Gauguin in the South Seas, Rodin and modernist sculpture, Matisse and expressionism, Picasso and cubism, Kandinsky and the Russian constructivists, Hoca and dada photomontage, O'Keefe and American modernism, and Dali and Freud. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

689. 20th Century Art II
Examines abstract expressionism as a framework for analyzing art since World War II. Focus on "Action Painting" and Color Field Painting, minimalism and conceptual art, pop art, earthworks, and sited sculpture, new image painting, post-modernism, and related critical theory. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

690. Women Artists of the 19th and 20th Centuries
Examination of the works of women artists of the past two centuries. After considering current scholarship related to some of the theoretical issues involved in studying art by women, the works of women artists from the Middle Ages through the early 19th century will be surveyed briefly. Focus will then shift to works by women artists of the past 150 years and their relationship to and impact on major movements in modern art. Prereq: one art history and another appropriate course. Writing intensive. 4 cr.

#691. A History of Venetian Art
The artistic culture of Venice from Byzantine times through Tiepolo and Canaletto. Course emphasis will be on Renaissance Venice, including topics such as the reclining female nude, the courtyard portrait, and the origins of landscape painting. Artists to be studied include Bellini, Giorgione, Titian, and Palladio. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

692. History of Photography
History of the photograph from its origins in the aesthetic and technological context of the early 19th century to the present. Lectures and discussions on such topics as the impact of early photography on painting, 19th-century landscape and travel photography, pictorialism, abstract photography, the photograph as metaphor, photojournalism and the interpretation of war, and postmodernism and photography. Critical reading of texts by Beaudelaire, Benjamin, Barthes, Sontag, and Sekula. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

693. American Art
A chronological survey of American painting and sculpture from the European colonization to the New York Armory Show of 1913, with emphasis on portraiture, narrative, still-life, and landscape painting. Examination of stylistic and thematic developments from the Puritan and Georgian New England portrait, the heroic manner of the Revolutionary era, the romantic landscape to the realism of the post-Civil War era and the birth of modernism. Typical works include Copley's Portrait of Paul Revere, Cole's Course of Empire, Homer's Fog Warning, Cassatt's At the Opera, and Eakins' Max Schmitt in a Single Scull. Prereq: one 400- or 500-level art history course. Writing intensive. 4 cr.

695. Special Problems in the Visual Arts
Topics and prerequisites to be announced before registration. May be repeated with permission of the instructor. Lab. 4 cr.

6951. Problems in Visual Arts/Italy
Part of the ITAL 685/686 study abroad program held in Italy. 4 cr.

697. Topics in Asian Art
A thematic study of the major artistic achievements in India, China, and/or Japan from pre-history to the twentieth century. Works of art in various media, including painting, sculpture, ceramics, calligraphy, prints, architecture, and gardens, will be examined in relation to philosophical concepts and to their cultural/historical contexts. Prereq: one 400- or 500-level art history course or permission of the instructor. Writing intensive. 4 cr.

699. Museum Studies
Introduction to the history and practices of American museums, including their purposes, organization, interpretation, policies and practices. Use of the Art Gallery, with occasional visits to other museums and art conservators. This course may not be used by studio art majors and B.F.A. candidates to fulfill the art history requirement. Prereq: two courses in art history or permission. Writing intensive. 4 cr.

700H. Honors Seminar
Requires successful completion of a written thesis supervised by two faculty advisers (one each from studio and art history faculty) to be reviewed by members of the department honors committee. The art history thesis will involve an original problem of art history and the studio art thesis will examine the student's own work. Honors students only. 4 or 8 cr.

#725. Wood Multiples
Development and construction of prototype furniture designs intended for more than one-of-a-kind production; jig and production strategies. (Offered concurrent to I.W.F.-sponsored biennial National Student Furniture Design Competition.) Prereq: ARTS 625 (4 credits.). Lab. Special fee. 4 cr.

732. Advanced Drawing
Treatment of more complex compositional problems; application of a broader range of solutions to pictorial problems to reinforce and expand individual concepts of image and technique. May be repeated for a maximum of 12 credits. Prereq: ARTS 633. Lab. 4 cr.

746. Advanced Painting
Development of a higher degree of technical skill to handle more advanced conceptual problems. Class assignments may be more individually directed. May be repeated for a maximum of 12 credits. Prereq: ARTS 646/648 credits). 4 cr.

767. Bronze Casting
Practice of designing, building, and maintaining a working sculpture foundry. Emphasis on a thorough understanding of the lost-wax investment casting process, including pattern making, mold making, wax working, investing, casting, chasing, and patinaing. Prereq: ARTS 667. (8 credits). Special fee. Lab. (Not offered every year.) 4 cr.

#784. Dutch Genre Painting
An intensive study of Dutch genre painting in the 17th century, focusing especially on the art of Vermeer and his contemporaries in the third quarter of the century. In addition to individual artists and their works, attention will be paid to aspects of their social background such as the emergence of privacy and the nuclear family, to parallels with the early novel, and to general themes governing realism as an artistic mode. Prereq: one 400- or 500-level art history course and instructor's permission. Writing intensive. 4 cr.

791. Art Education (Elementary)
Children's creative growth as revealed through their visual expression. Development of elementary art education programs with emphasis on objectives, methods, materials and techniques to foster creativity. Suggested prereq: EDUC 500. 4 cr.

792. Art Education (Secondary)
The creative process in the visual arts in relation to the development and skills of middle and high school students in the public schools; mechanics of beginning and maintaining a secondary art program; exploring resources for art education programs on the secondary level. Suggested prereq: EDUC 500. 4 cr.

795. Methods of Art History
Essential bibliography and the methodology of research; the variety of approaches to art historical scholarship. Readings, discussion, and projects in connoisseurship, iconography, and other art historical methods. Open to advanced students with a strong art history background. Required for art history majors. It is strongly recommended that students take this course in their junior year. Prereq (for non-art history majors): permission. (Usually offered fall semester only.) Writing intensive. 4 cr.

796. Independent Study in the Visual Arts
A) Photography; B) Sculpture; C) Drawing; D) Painting; E) Printmaking; F) Water Media; G) Architectural Design; H) Curatorial Assistant; I) Painting in Italy; J) Ceramics; K) Wood Design; L) Art History: Open to highly qualified juniors and seniors who have completed the advanced level courses in the chosen medium. May be repeated to a total of 8 credits. Prereq: permission of department chairperson and supervising faculty member or members. Special fee on some sections. 1 to 8 cr.

798. Seminar/Senior Thesis
Readings and discussions oriented toward the intellectual premises of art. Culminates in mounting an exhibition of the student's work. Required of all students in the B.F.A program. Other advanced students may elect with instructor's permission. A year-long course; an IA grade (continuous course) will be given at the end of the first semester. Lab. Variable credit; may be repeated to a total of 8 credits. B.F.A. majors must take 8 credits total. 4 to 8 cr.

799. Seminar in Art History
Topics and prerequisites to be announced before registration. May be repeated with permission of instructor. Writing intensive. 4 cr.
Biochemistry (BCHM)

(For program description, see page 88.)

600/600W. Field Experience
A supervised experience providing the opportunity to apply academic experience in settings associated with future professional employment and/or related graduate opportunities. Must be approved by a faculty adviser selected by the student. May be repeated to a maximum of 8 credit hours. Prereq: permission. Cr/F. 1 to 4 cr. 600W is writing intensive.

658. General Biochemistry
A comprehensive, introductory course emphasizing the cellular metabolism and the structure and function of proteins, nucleic acids, carbohydrates, and lipids. Prereq: BIOL 411, CHEM 545-546, CHEM 547-548, or CHEM 651-652. Coreq: BCHM 659 (except BCHM majors who are encouraged to take BCHM 755). 3 cr.

659. General Biochemistry Laboratory
Structured laboratory experiments that provide training in analytical and preparative techniques fundamental to modern biochemistry and molecular biology. Coreq: BCHM 658 (except for BCHM majors who are encouraged to take BCHM 755 instead of BCHM 659). Special fee. 2 cr.

702/702W. Endocrinology
Biochemical and molecular structure and function of vertebrate endocrine systems. Influence of endocrine system on the physiology of vertebrates, with special reference to mammals. Current investigations of the endocrine system as a regulator and integrator of body functions including such systems as growth, reproduction, metabolism, differentiation, and behavior. (Also offered as ANSC 702.) Prereq: BCI-L 658 or 751/permission. Special fee. 4 cr. 702W is writing intensive.

711. Genomics and Bioinformatics
The methods, applications, and implications of genomics—the analysis of whole genomes. Microbial, plant and animal genomics are addressed, as well as medical, ethical and legal implications. The lab provides experience with a range of bioinformatics approaches—the computer applications used in genome analysis. Prereq: BIOL 604. (Also offered as GEN 711.) Lab. 4 cr.

750. Physical Biochemistry
Structure, interactions, and physical-chemical properties of biomolecules. Thermodynamic, kinetic, and spectroscopic methods for the study of proteins and nucleic acids. Prereq: 2 semesters organic chemistry, 1 semester of calculus/ or permission. 3 cr.

751. Principles of Biochemistry
In-depth survey of biochemistry: macromolecular structure; structure and function of proteins, nucleic acids, carbohydrates, and lipids. Prereq: CHEM 657-658 or CHEM 651-652 or CHEM 545 and 546 and BCHM 658-659; or permission. 4 cr.

752. Principles of Biochemistry
Continuation of in-depth survey of biochemistry: metabolism of amino acids, nucleotides, carbohydrates and lipids; macromolecules synthesis and regulation; molecular biology of the eukaryotic cell. Prereq: BCHM 751 or permission. 4 cr.

754. Laboratory in Biochemistry and Molecular Biology of Nucleic Acids
Application of modern techniques to the analysis of biomolecules, with an emphasis on nucleic acids; includes DNA isolation and analysis, cloning, sequencing, and analysis of gene products. Prereq: BCHM 658/659; 751; or permission. (Also offered as PBIO 754 and GEN 754.) Special fee. Writing intensive. 5 cr.

755. Laboratory in Biochemistry and Molecular Biology
Application of modern techniques to the characterization and purification of biomolecules, with an emphasis on proteins and nucleic acids; analysis of enzyme kinetics; and basic techniques used in molecular biology. (Majors anticipating taking BCHM 799 should take this course in their junior year.) Prereq: BCHM 751-752/ or permission. BCHM 752 may be taken concurrently with BCHM 755. Special fee. Writing intensive. 5 cr.

763. Biochemistry of Cancer
Molecular mechanisms of viral and chemical carcino­genesis; role of oncogenes in normal cell growth, development, and differentiation. Biochemical basis of cancer chemotherapy. Prereq: BCHM 658 or 751/permission. 3 cr.

766. Environmental Genomics
Environmental genomics uses high throughput genomic-scale technologies to investigate ecological and evolutionary theory, to provide a more complete understanding of how organisms respond to environmental change at the molecular genetic level. Course covers an array of systems involved in this emerging field, with the central aim of understanding the effects of environmental change on genome structure, gene expression, and adaptive evolutionary change. Information is derived from the primary literature in the field and covers practical and technical concepts as well as the underlying theoretical basis for the major research themes. Prereq: BIOL 604; or permission. (Also offered as GEN 766.) 4 cr.

771. Molecular Genetics
Structure, organization, replication dynamics, and expression of genetic information in eukaryotes. Focus on molecular genetic mechanisms of gene expression and its control; molecular genetic control of cell division and differentiation during development. Prereq: BIOL 604; or permission. (Also offered as GEN 771.) 4 cr.

#782. Developmental Genetics
The molecular genetic basis of metazoan development. Focuses on how genes direct the process of development and how this problem is analyzed in model organisms using molecular genetic approaches. Topics include: control of cell division, maternal factors, cell-cell interactions, and differential gene expression. Prereq: BIOL 604; or permission. (Also offered as GEN 782.) Not offered every year. 3 cr.

790. Current Topics in Biomedicine
The dramatic advances in molecular biology and biochemistry during the last two decades have led to explosive growth in the accumulation of biomedical knowledge. To “discover” the literature is an essential element of training in any molecular discipline in biology. The first phase of the course will cover the use of literature search tools, and how to read scientific papers, write a review and make presentations effectively. The bulk of the time will be spent on current topics in biomedicine selected by the class. With guidance from the instructor, the class will derive reading lists, discuss the literature, and then write short essays on each topic. Participants will also prepare a “term” project for audiovisual presentation to the class in the final two weeks. Prereq: BIOL 605 or instructor permission. Writing intensive. 4 cr.

794. Protein Structure and Function
Analysis of how the three-dimensional architecture of soluble and membrane proteins contributes to their biochemical function. Topics include methods for determining the structure of proteins, protein folding, protein targeting, and mechanisms of enzyme catalysis. Computer resources will be used for protein modeling and structural prediction. Prereq: BCHM 658 or 751. 4 cr.

795/795W. Investigations
Independent study in various areas including but not limited to: genetics, signal transduction, gene regulation, molecular evolution, biochemistry of cancer, biophysics of macromolecules, endocrinology, and glyco­biology. May include readings, laboratory work, organized seminars and conferences. Prereq: permission. Not more than 4 total credit hours can be applied to BCHM or major electives. 1 to 4 cr.

799, 799H. Senior Thesis
Research in biochemistry and molecular biology for senior majors. Topics may include: developmental genetics; signal transduction; gene regulation; molecular evolution; biochemistry of cancer; biophysics of macromolecules; endocrinology, glyco­biology. May be repeated to a maximum of 4 credits. Prereq: BCHM 659 or 755; permission. Writing intensive. 1 to 4 cr.

Biology (BIOL)

(For program description, see page 89.)

400. Professional Perspectives on Biology
Views scope of biology and explores professional opportunities for biological sciences majors. Guest speakers from on and off campus present seminars and lead discussions on contemporary issues in biology. Departmental and interdepartmental major and option programs and strategies for achieving professional goals are discussed. Required for all first-semester biology majors. Cr/F. 1 cr.

401. Topics
Introduction to specific areas of study within biological sciences. Provides an avenue to explore recent excitements in biological sciences, and fundamental questions about how living organisms function and adapt to different environments; introduction to contemporary research in various biological sciences. Several concurrent sections organized around themes; lecture/discussion. Cr/F. 1 cr.

404. Biotechnology and Society
The history and science of biotechnology and genetic engineering of bacteria, plants, and animals including humans. Applications of DNA technology, cloning and genetic engineering to agriculture, biomedicine, industrial products and environmental problems. Discussion of economic, social, environmental, legal, and ethical issues related to the applications of biotechnology and genetic engineering. No credit for students who have completed BSCI 422 (UNHM). 4 cr.

411/411H. Principles of Biology I
Introduction to structure and function of cells; tissues and organs; physiological processes; genes and heredity. Required for majors in the biological sciences. Special fee. Lab. 4 cr.
412/412H. Principles of Biology II
The biology of organisms, including survey of kingdoms, behavior, evolution, and ecology. Required for majors in the biological sciences. Special fee. Lab. 4 cr.

415. Watershed Watch
Project Watershed Watch brings together several highly successful areas of excellence at UNH: capabilities in satellite remote sensing and geographic information systems, microbial ecology, and/or physics. The goal of this class will be to provide students with an understanding of what watershed interactions and/or physics entail and to prepare them for additional, more in-depth classes in criminalistics or forensic science. Special fee. 2 cr.

420. Introduction to Forensic Sciences
This course is an introductory survey course in Forensic Sciences. The focus will be on the recognition, collection, preservation and analysis of physical evidence related to crime scene investigations. Students will be presented with various state of the art techniques utilized in the analysis of intracellular dynamics, mechanisms of cell motility, oncogenesis, control of gene expression, and pattern formation. Prereq: BIOL 411 and 412; CHEM 403 and 404. College math or statistics suggested. Offered each semester. Special fee. 4 cr.

444. Emergence of Life in the Universe
How did life begin? Is there life on other planets? Can "synthetic" life be created in the laboratory? An informed exploration of questions and theories about the origin and nature of life, the mechanisms of evolution and diversification, the possibilities of past and future dissemination of life in the universe, and the growing power of human beings to understand and influence these phenomena, including ethical issues. Writing intensive. 4 cr.

528. Applied Biostatistics I
Development of elementary statistical techniques through the analysis of prepared biological data. Continuous and discrete probability distributions, distributions of sample statistics, small-sample theory, regression, correlation, and analysis of variance. No credit for students who have completed ADM 430; ADMN 420; EREC 525; HHS 540; MATH 639; MATH 649; PSYC 402; SOC 502. 4 cr.

541. General Ecology

600/600W. Field Experience
A supervised experience providing the opportunity to apply academic experience in settings associated with future professional employment and/or related graduate opportunities. Must be approved by a faculty adviser selected by the student. May be repeated to a maximum of 8 credit hours. Prereq: permission. Cr/E. 1 to 4 cr. 600W is writing intensive.

601. Biology of Plants
Structural and functional biology of the plant organism, with emphasis on land plants. Evolution of vegetative processes and sexual reproduction/breeding systems. Plant adaptations to environmental challenges. Prereq: BIOL 411, 412 or ZOOL 412. 4 cr.

602. Project Lake Watch
Project Lake Watch brings together several highly successful areas of excellence at UNH: capabilities in satellite remote sensing and geographic information systems, microbial ecology, and/or physics. The goal of this class will be to provide students with an understanding of what watershed interactions and/or physics entail and to prepare them for additional, more in-depth classes in criminalistics or forensic science. Special fee. 2 cr.

604. Principles of Genetics
Chemical structure of genetic material, Mendelism, gene recombination, and chromosome mapping. Mutation, gene expression and regulation, recombinant DNA. Quantitative inheritance and population genetics. Prereq: BIOL 411 and 412; CHEM 403 and 404. College math or statistics suggested. Offered each semester. Special fee. 4 cr.

605. Eukaryotic Cell and Developmental Biology
Cell and developmental biology of eukaryotic animals and plants. General topics include the structure and function of major cellular compartments, an analysis of intracellular dynamics, mechanisms of intercellular communication, and mechanisms for elaborating and integrating multicellular animals and plants. Special topics include mitogenesis, cell motility, oncogenesis, control of gene expression, and pattern formation. Prereq: BIOL 411 and 412; CHEM 403 and 404. Special fee. Lab. 4 cr.

695, 696. Biology Teaching Practices
Students assist in teaching labs in undergraduate biology courses supervised by the lab coordinator/instructor. Responsibilities include facilitating lab endeavors, giving a presentation, and writing a report. Prereq: permission. May be repeated to 8 credits. 1 to 4 cr.

711. Applied Biostatistics II
Design and analysis of biological and ecological research experiments. "Real world" studies used to discuss the identification of hypotheses, appropriate experimental design, and the application of statistical analyses including ANOVA, ANCOVA, correlation and regression, cluster analysis, classification and ordination techniques. Theoretical statistical concepts tailored to consider student's own thesis and dissertation research, allowing statistical problems to be addressed at various stages of the research process. Common computer packages used for analyses. Prereq: BIOL 528; permission. Special fee. 4 cr.

795/795W. Independent Investigations
Topics may include teaching practicum in a biological science supervised by a biology faculty member (permission required); research practicum in a biological science supervised by a biology faculty member (permission required); or special topics of current interest in biology. Lecture-discussion format. Prereq: 12 credits of biology or permission. May be repeated to 4 credits. 1 to 4 cr. 795W is writing intensive.

799. Honors Senior Thesis
Independent research requiring a written proposal, a thesis, and a presentation of research results to an audience of faculty and/or students. Intended for biology majors completing biology honors-major requirements. Contact biology program coordinator prior to senior year to arrange supervision and obtain permission. 2 consecutive semesters (4 credit minimum total). Writing intensive. 2 to 8 cr.

Chemical Engineering (CHE)

(For program description, see page 55.)

410. Energy and Environment

501. Introduction to Chemical Engineering I
Systems of units; material balances and chemical reactions; gas laws; phase phenomena. 3 cr.

502. Introduction to Chemical Engineering II
Energy and material balances for systems with and without chemical reactions; design case studies. 3 cr.

601. Fluid Mechanics and Unit Operations
Continuity, momentum, and energy equations; laminar and turbulent flow in pipes; rheology. Applications to flow in porous media, filtration, and fluidization. 3 cr.

602. Heat Transfer and Unit Operations
Thermal properties of materials, steady-state and transient conduction and convection; radiation; applications to heat exchangers and process equipment. 3 cr.

541. General Ecology
603. Applied Mathematics for Chemical Engineers
Mathematical modeling and analysis of chemical engineering problems. Analytical methods for first- and second-order differential equations; numerical solutions; series solutions; Bessel functions; Laplace transforms; matrix algebra. Interpretation and solution of partial differential equations. Prereq: knowledge of scientific computer programming. Lab. 4 cr.

604. Chemical Engineering Thermodynamics
Volumetric and phase behavior of ideal and real gases and liquids; cycles; steady-flow processes; chemical equilibrium. Lab. 4 cr.

605. Mass Transfer and Stagewise Operations
Diffusion in gases, liquids, and solids; design and analysis of distillation, absorption, adsorption, extraction, and other stagewise equipment and operations. 3 cr.

606. Chemical Engineering Kinetics
Use of laboratory data to design commercial reactors. Continuous, batch, plug-flow, and stirred-tank reactors for homogeneous and catalytic multiphase reactions. 3 cr.

608. Chemical Engineering Design
Introduction to cost engineering. Application of acquired skills to design of chemical processes. Individual major design project required. Safety for industrial processes. Lab. (Also offered as ENE 608.) Writing intensive. 4 cr.

612. Chemical Engineering Laboratory I
Selected experiments in fluid mechanics, heat transfer, and unit operations. Writing intensive. 3 cr.

613. Chemical Engineering Laboratory II
Selected experiments in mass transfer, stagewise operations, thermodynamics, and kinetics. Writing intensive. 3 cr.

695. Chemical Engineering Project
Independent research problems carried out under faculty supervision. 1 to 4 cr.

696. Independent Study
Prereq: permission of the adviser and department chairperson; granted only to students having superior scholastic achievement. 1 to 4 cr.

#701. Introduction to Polymer Engineering
Principles of polymer chemistry, polymerization kinetics, polymer rheology, and material characteristics. Design and analysis of polymer reactors, extruders, molding machines, and other forming operations. Lab. 4 cr.

705. Natural and Synthetic Fossil Fuels

712. Introduction to Nuclear Engineering
Development of nuclear reactors; binding-energy; radioactivity; elements of nuclear reactor theory; engineering problems of heat transfer, fluid flow, materials selection, and shielding; environmental impacts. 4 cr.

744. Corrosion
Fundamentals of corrosion processes in industrial and environmental settings; thermodynamics, kinetics, and mass transport in local corrosion cells; protection by electrochemical, chemical, surface modification or barrier methods; instrumental methods in corrosion science. Lab. 4 cr.

752. Process Dynamics and Control
Dynamic behavior of chemical engineering processes described by differential equations; feedback control concepts and techniques; stability analysis. Lab. (Also listed as ENE 752.) 4 cr.

761. Biochemical Engineering
Immovilized enzyme technology, microbial biomass production, transport phenomena in microbial systems, biological reactor design, process instrumentation and control, applications in separation and purification processes. Lab. 4 cr.

762. Biomedical Engineering
Transport phenomena and chemical reactions in physiological systems. Formulation and interactions of biomaterials. Artificial kidney, vascular prosthesis, drug delivery, protein and cell adhesion. Introduction to tissue engineering. Lab. 4 cr.

Chemistry (CHEM)

(For program description, see page 56.)

400. Freshman Seminar
An introduction to the chemistry profession. Talks and workshops on the career of a chemist in academia, industry, medicine, law, teaching and government. Required for chemistry majors. Cr/F. 1 cr.

403. General Chemistry
Fundamental laws and concepts applied to nonmetals, metals, and their compounds. For students who plan to take further chemistry courses. Required for chemistry majors. Previous chemistry recommended. Knowledge of algebra, exponentials, and logarithms required. Special fee. Lab. Cannot be taken for credit if credit received for CHEM 401, 405, or 409. 4 cr.

404/404H. General Chemistry
Fundamental laws and concepts applied to nonmetals, metals, and their compounds. For students who plan to take further chemistry courses. Previous chemistry recommended. Knowledge of algebra, exponentials, and logarithms required. Required for chemistry majors. Special fee. Lab. Cannot be taken for credit if credit received for CHEM 402. 4 cr.

405. General Chemistry
Basic principles; atomic structure, bonding, equilibria, and thermodynamics. Prereq: one year of high school chemistry, algebra, and knowledge of exponentials and logarithms. Cannot be taken for credit if credit received for CHEM 403–404. Required for chemical engineering, mechanical engineering, electrical and computer engineering, environmental engineering: industrial majors. Not applicable for credit for majors in chemistry or biochemistry. 4 cr.

444. Element of Chemistry
This course will deal with a single element for course participants to examine and discuss. We will explore the historical and social context of its discovery. We will consider why the element is potentially crucial to living beings, how it interacts with some other elements and our perception of the element. This will involve an overview of some chemical and biological concepts. This course cannot be counted toward the major. (Not offered every year.) 4 cr.

444A. Fire and Ice
Embodies a focus on the perception, movement, creation, understanding, and everyday use of heat. Examines historical evolution and controversy regarding the concept of heat across physical and life sciences. 4 cr.

496. Freshman Independent Study
Independent study for students who have not had organic chemistry. Designed for students who wish to pursue independent study topics, but do not have the experience to pursue lab research. Cannot be counted toward the major. (Not offered every year.) 1 to 8 cr.

501. Peer-led Team Learning in Chemistry
Initial experience as peer instructional leader. Practical application of theories of cognition, group dynamics, learning, and motivation to helping other students learn chemistry in general chemistry. Requires one weekly meeting with students. Permission required. Prereq: CHEM 403 or 404. 2 cr.

502. Advanced Peer-led Team Leadership in Chemistry
Development and assessment of leadership skills. Practical application of theories of cognition, group dynamics, learning, and motivation to helping other students learn chemistry in general chemistry. Requires one weekly meeting with students. Permission required. Prereq: CHEM 403 and CHEM 501. 1 cr.

517. Quantitative Analysis Laboratory
Volumetric methods with an emphasis on technique; separations; and selected instrumental methods such as potentiometry, spectrophotometry, atomic absorption, and gas chromatography. Prereq: CHEM 404 or 405. Coreq: CHEM 518. Lab. 4 cr.

518. Quantitative Analysis Laboratory
Volumetric methods with an emphasis on technique; separations; and selected instrumental methods such as potentiometry, spectrophotometry, atomic absorption, and gas chromatography. Prereq: CHEM 404 or 405. Coreq: CHEM 517. Special fee. 1 cr.

545. Organic Chemistry
Introductory study of carbon compounds for those who desire a brief terminal course. Prereq: CHEM 404 or 405. Coreq: CHEM 546. Students receiving credit for CHEM 545 may not receive credit for CHEM 402, 547–548, or 651–652. 3 cr.

546. Organic Chemistry Laboratory
Special fee. Lab. 2 cr. Coreq: CHEM 545.

547, 548. Organic Chemistry
Principal classes of organic compounds, aliphatic and aromatic, class reactions and structural theory. Intended primarily for chemistry and biochemistry majors. Prereq: CHEM 404 or 405. Coreq: CHEM 546. Students receiving credit for CHEM 547–548 may not receive credit for either CHEM 545 or 651–652. 3 cr.

549, 550. Organic Chemistry Laboratory
Special fee. Lab. 2 cr. Coreq: CHEM 547.

574. Introduction to Inorganic Chemistry
Elementary concepts including periodicity, descriptive chemistry of metals and nonmetals, and coordination compounds. Prereq: CHEM 404; 405/permission. 3 cr.

651–652/652A. Organic Chemistry
Principal classes of organic compounds, aliphatic and aromatic, class reactions and structural theory. Intended primarily for prehealing arts, biological science, and health science students. Prereq:
CHEM 404; 405/or permission. Coreq: CHEM 653. Students receiving credit for CHEM 651-652 may not receive credit for either CHEM 545 or 547-548. 3 cr.

653-654. Organic Chemistry Laboratory
Special fee. Lab. 2 cr. Coreq: CHEM 651.

681. Physical Chemistry
A one-semester survey course. Properties of matter, thermochemistry and thermodynamics, solutions, chemical equilibria, chemical kinetics. Prereq: CHEM 403 and 404, or CHEM 405. Coreq: CHEM 682. No credit earned if credit received for CHEM 683 and 685, or CHEM 684 and 686. 3 cr.

682. Physical Chemistry Lab
Properties of matter, thermochemistry and thermodynamics, solutions, chemical equilibria, chemical kinetics. Prereq: CHEM 403 and 404 or CHEM 405 with labs. Coreq: CHEM 681. Special fee. No credit earned if credit received for CHEM 683 and 685, or CHEM 684 and 686. 1 cr.

683. Physical Chemistry I
The properties of gases, liquids, and solids; thermochemistry and thermodynamics; solutions, chemical equilibria, reaction rates, conductance, and electro motive force. Prereq: CHEM 404 or 405; MATH 426. Pre- or Coreq: PHY 402 or 407. Coreq: CHEM 685-686. 3 cr.

684. Physical Chemistry II
The properties of gases, liquids, and solids; thermochemistry and thermodynamics; solutions, chemical equilibria, reaction rates, conductance, and electro motive force. Prereq: CHEM 404 or 405; MATH 426. Pre- or Coreq: PHY 402 or 407. Coreq: CHEM 685-686. 3 cr.

685-686. Physical Chemistry Laboratory
Measurement of thermodynamic properties, chemical kinetics, and methods of determining the structure of matter. Prereq: CHEM 404 or 405; MATH 426. Pre- or Coreq: PHY 407 or 402. Coreq: CHEM 683-684. Special fee. 2 cr.

696. Independent Study
For exceptional students. Individual reading, writing, or laboratory work carried out under the tutelage of a faculty member. May be used to replace specific credits in chemistry. Prereq: approval of the adviser and department chairman. Credits to be earned. 1 to 4 cr.

698. Seminar
Student reports on topics of interest. Prereq: CHEM 548 or 652; CHEM 684. Writing intensive. 1 cr.

699. Thesis
Yearlong investigation in a selected topic, with background and experimental investigation. For chemistry majors who have completed CHEM 548, 684, and 762. Required for B.S. majors. Strongly recommended for B.A chemistry majors. Prereq: 2.50 average and approval of department chairperson. Permission required. Lab. Two semesters of 4 credits each are required. Writing intensive. 4 cr.

708. Spectroscopic Investigations of Organic Molecules
Identification and structural analysis of chemical compounds by selected instrumental methods. Typical topics include proton and carbon-13 NMR spectroscopy, IR and UV spectroscopy, and mass spectrometry. 1 to 4 cr.

755. Advanced Organic Chemistry
Methods of synthesis and determination of structure, including stereochemistry of complex organic compounds. Prereq: CHEM 548 or 652 or equivalent. Coreq for CHEM majors: 756. 3 cr.

756. Advanced Organic Chemistry Laboratory
Synthesis and structural determination of complex organic compounds, techniques for the separation, determination of purity, and identification of compounds by spectroscopic and chemical means. Coreq for CHEM majors: 755. Special fee. 2 or 3 cr.

762. Instrumental Methods of Chemical Analysis
Theory, instrumentation, and application of methods such as atomic absorption, coulometry, emission spectrography, gas and liquid chromatography, polarography, potentiometry, IR and UV-VIS absorption spectrophotometry, and mass spectrometry to chemical analysis. Prereq: CHEM 406 or 517; CHEM 684 as a pre- or corequisite or permission. Coreq: 763. 3 cr.

763. Instrumental Methods of Chemical Analysis Laboratory
Experimental parameters, error analysis, and applications of the methods covered in CHEM 762. Coreq: CHEM 762. Special fee. 2 or 3 cr.

774. Inorganic Chemistry
Basic theoretical concepts and their applications to inorganic reactions and compounds. Prereq: organic chemistry; physical chemistry/or permission. Coreq: CHEM 775. 3 cr.

775. Inorganic Chemistry Laboratory
In-depth instruction of selected techniques of synthesis and characterization of inorganic compounds. Emphasis on the analysis and presentation of results and experiment planning. Includes open-ended and collaborative projects. Coreq: CHEM 774. Special fee. 2 cr.

776. Physical Chemistry III
Application of quantum theory to atomic electron structure, spectroscopy, and molecular structure. Prereq: CHEM 683-684, Special fee. Lab. 4 cr.

795. Special Topics
New or specialized topics not covered in regular course offerings. May be repeated to a maximum of 4 credits. Prereq: permission. 2 to 4 cr.

Chinese (CHIN)

401, 402. Elementary Chinese
Aural-oral practice in meaningful contexts of the fundamental vocabulary and grammar of Mandarin Chinese. Reading and writing in romanization (pinyin) and in Chinese characters. Special fee. 4 cr.

#425. Introduction to Chinese Culture and Society
Taught in English. Aspects of the political, social and cultural life of China through readings, discussion, paper, and film. Strongly recommended for students planning an Asian Studies minor. Special fee. 4 cr.

503, 504. Intermediate Chinese
Continuation of CHIN 401-402. Conducted entirely in Chinese, with work on listening comprehension, speech, reading, and writing of Chinese characters, with increasing attention to reading contemporary Chinese texts. Special fee. 4 cr.

521. Chinese Literature in Translation
Representative works of master Chinese writers reflecting themes of 20th century China. Lu Hsun, Shen 'Ts'ung-Wen, Bei Dao, and others. Lectures, discussion, and readings in English. Special fee. 4 cr.

795. Independent Study
Open to highly qualified juniors and seniors. To be taken only with the permission of department chairperson and of the supervising faculty member or members. Barring duplication of subject, may be repeated for credit. 1 to 4 cr.

Civil Engineering (CIE)
(For program description, see page 57.)

402. Introduction to Civil Engineering
Introduction to the civil engineering profession: structural, geotechnical, water resources, materials, and environmental. Overviews the civil project process including the creative design process, teamwork, bidding and construction. The relationship between civil engineering works and society including ethics, earthquakes, failures, successful signature structures, current events, and professional licensure. The production of professional engineering documents including writing tasks and calculations sets. Campus resources, the University system, and relationship between required curriculum, student objectives, and the civil engineering profession. Introduction to spreadsheet software, data analysis, and probability and statistics. 3 cr.

505. Surveying and Mapping
Principles of land measurements by ground, photogrammetric and satellite methods to model the environment. Application of theory of measurements to perform and adjust engineering survey. Conformal mapping and its application to state plane coordinates. Digital mapping and Geographic Information Systems. Construction and cadastral surveying. Pre- or Coreq: MATH 425 or permission. Lab. Writing intensive. 4 cr.

525. Statics for Civil Engineers
Introduction to statics with emphasis on civil engineering topics; two and three dimensional force systems; static equilibrium; friction; analysis of trusses and beams; centroids; and moment and shear diagrams for flexural members. Pre- or Coreq: MATH 426. 3 cr.

526. Strength of Materials
Strength of materials with emphasis on civil engineering applications. Virtual work; work and energy relationships; analysis of members subjected to flexure, torsion, and axial loads; stresses and strains; and stability of columns. Prereq: CIE 525 or ME 525. 3 cr.

533. Project Engineering
Techniques for financial analysis, and operation and management of engineering systems, engineering economics, material take-offs, estimating, scheduling, modeling physical systems, and decision-making. CIE/ENE major or permission. 3 cr.

622. Engineering Materials
Structural properties and applications of the various materials used in civil engineering projects, including steel, cement, mineral aggregates, concrete, timber, and bituminous materials. Microstructure and properties of common metals, plastics, and
627. Dynamics
Particle and rigid body dynamics. Topics include
dynamic equilibrium, work and energy relation­
ships, momentum, impulse, and impact; rotar­
tional and translational interactions, and friction.
Introduction to vibrations and their application to
structural dynamics and geotechnical engineering.
Prereq: CIE 525 or ME 525, or permission. 3 cr.

642. Fluid Mechanics
Properties of fluids, fluid statics, continuity, mo­
momentum and energy equations, resistance to flow,
boundary layer theory, flow in open channels and
piping systems, dimensional analysis, similitude,
drag, and lift. Laboratory exercises on measurement
of fluid properties, energy principles, flow resis­
tance, discharge measurements, momentum, hydro­
power, groundwater flow, and settling of spheres.
Prereq: PHYS 407, CIE/ENE Hydrology major,
or permission. Lab. Writing intensive. 4 cr.

665. Soil Mechanics
Soil classification and physical properties.
Permeability, compressibility, consolidation, and
shearing resistance are related to the behavior
of soils subjected to various loading conditions.
Prereq: CIE 662, 642, CIE/ENE major, or per­
mission. Lab. 4 cr.

681. Classical Structural Analysis
Analytical stress and deflection analysis of determi­
nate and indeterminate structures under static and
moving loads by classical methods. Prereq: CIE
526, CIE major, or permission. 3 cr.

721. Pavement Design
Flexible and rigid pavements and bases for high­
ways, airports, city streets, and industrial floors;
pavement selection, construction methods, materi­
als, specifications. Prereq: CIE 665 or permis­
sion. 3 cr.

722. Properties and Production of Concrete
Basic properties of hydraulic cements and mineral
aggregates and their interactions in the properties
of plastic and hardened concrete; modifications
through admixtures; production handling and
placement problems; specifications; quality control
and acceptance testing; lightweight, heavyweight,
and other special concretes. Prereq: CIE 622 or
permission. 3 cr.

723. Bituminous Materials and Mixtures
Considerations of major types of bituminous ma­
terials, asphalt cements, cutback asphalts, asphalt
emulsions, and tar; influence of chemical compo­
sition on physical properties; desirable aggregate
characteristics for bituminous mixtures; construc­
tion techniques; current practices for determining
optimum asphalt contents. Prereq: CIE 622 or
permission. 3 cr.

741. Open Channel Flow
Energy and momentum principles in open channel
flow; flow resistance; channel controls and tran­
sitions; unsteady flow concepts and dam failure
studies. Modeling with HEC programs. Prereq:
CIE 642 or permission. 3 cr.

745. Engineering Hydrology
Hydrologic cycle, probability theory related to
hydrology and the design of water resources struc­
tures, water law, flood discharge prediction, hydro­
graph development, hydraulic and hydrologic river
routing, reservoir routing, theory of storage, reser­
voir operations, hydropower development, model­
ing of watershed hydrology with program HEC-1,
HEC-HMS, multipurpose projects. 3 cr.

750. Ecohydrology
Introduction to ecohydrological concepts in ter­
restrial and riverine systems. Topics include the
historical practices, resource management impacts,
hydrologic variability, and the relationships among
water and ecology, vegetation, biology, geomor­
phology, and water quality. Prereq: CIE 745 or
ESCI 705 or permission. 3 cr.

754. Transportation Engineering and
Planning
Fundamental relationships of traffic speed, density,
and flow applied to public and private modes of
transport. Principles of demand forecasting and
urban systems planning. Prereq. permission. 3 cr.

755. Design of Pressurized Water
Transmission Systems
Theory developed for individual components to
large complex systems. Analysis and designs of
components and systems. Topics include: steady
and unsteady closed conduit flow, valves and me­
ters, pump requirements, pump selection, system
planning and layout, water hammer, and system
operation and maintenance. Pressure system mod­
eling with program EPANET. Prereq: CIE 642 or
permission. 4 cr.

757. Coastal Engineering and Processes
Introduction to small amplitude and finite ampli­
tude wave theories. Wave forecasting by significant
wave and wave spectrum method. Coastal pro­
cesses and shoreline protection. Wave forces and
wave-structure interaction. Design of coastal struc­
tures. Introduction to mathematical and physical
modeling. Prereq: CIE 642 or permission. 3 cr.

758. Stormwater Management Designs
Historic review of stormwater management leading
up to the current regulatory framework. Overview
of stormwater management strategies, strategy se­
lection, and the targeting of specific contaminants,
contaminant removal efficiencies, construction and
site selection, and system maintenance. Hydrologic
concepts including watershed and storm charac­
teristics, design hydrology (peak flows, storm and
storm treatment volumes), hydrograph routing, and
critical review of hydrology and drainage reports.
Design and sizing of treatment systems including
conventional, BMPs, low impact development, and
manufactured devices. Rainfall runoff calculations
with US SCS TR55 model. Prereq. CIE 642 or
permission. 4 cr.

759. Stream Restoration
The assessment, planning, design, engineering,
and monitoring of stream and watershed prac­
tices intended to protect and restore the quality
and quantity of flowing surface waters and stream
corridors. Lecture material covers hydrology, geo­
morphology, and ecosystems, with the intent of
understanding the variables associated with stream
systems and their interplay. Students measure field
variables and then are challenged with actual de­
signs. Examples of stream restoration issues in­
clude: instream flow, dam removal, induced re­
trenchment to fish habitat, and channel stabiliza­
tion. 3 cr.

760. Foundation Design I
Foundation design based on subsurface investiga­
tion and characterization using current methods of
laboratory and in situ testing. Use of consolidation
theory and bearing capacity theory for the design
of shallow foundations including footings and rafts.
Basic design of pile foundations. Earth pressure
theory applied to design of retaining walls. Slope
stability theory and applications. Prereq: CIE 665
or permission. 4 cr.

761. Foundation Design II
Advanced pile and pier design under vertical and
lateral loads. Slope stability by circular and non­
circular arc methods. Design of flexible bulkhead
walls and mechanically stabilized walls. Excavation
and dewatering. Soil and site improvement. Prereq:
CIE 760 or permission. 3 cr.

762. Introduction to Geotechnical
Earthquake Engineering
Overviews earthquake source mechanisms; magni­
tude and intensity; seismicity of the United States.
Dynamics of simple structures; response spectra.
Selection of design parameters; source, magnitude,
input records. Measurement of dynamic characteris­
tics of soils; site response, liquefaction, and ground
deformation. Prereq: CIE 760 or permission. 3 cr.

766. Geo-Environmental Engineering
Soil composition and structure; hydrogeology; at­
tenuation and contaminant transport; containment
design including landfills, geosynthetics for liners
and covers, leachate collection systems, vertical
cutoff walls and stability analyses; geo-environ­
mental site characterization and investigation using
geotechnical and geophysical methods; ground
water, soil and gas monitoring and sampling; re­
mediation including in situ and ex situ techniques
and treatment methods. Prereq: CIE 665 or per­
mission. 3 cr.

774. Reinforced Concrete Design
Introduces the design of reinforced concrete struc­
tural members by the strength method and con­
sidering deflection performance. Includes loads,
approximate analyses, slabs, beams, and columns.
Prereq: CIE 622, 681; or permission. 4 cr.

778. Issues in Engineering Practice and
Management
Non-technical professional engineering topics in­
cluding: participation in multidisciplinary teams,
temperamental and human resources skills, verbal
and written communication skills, project manage­
ment, marketing, ethics, professional licensure, profes­
sional liability, and contractor administration.
Prereq: seniors only; juniors with permission. 3 cr.

782. Timber Design
Introduces the design of timber structures. Struc­
tural properties of wood, determination of hori­
tzontal and vertical loads, horizontal and verti­
cal load-resisting systems, and design of horizon­
tal diaphragms, shear walls, beams, and columns.
Bolted, screwed, and nailed connections. Prereq:
CIE 681 or permission. 3 cr.

783. Matrix Structural Analysis
and Modeling
Modeling and analysis of determinate and inde­
terminate structures by matrix computer methods.
Calculation of matrix elements using compatibility,
equilibrium, and constitutive relationships. Plane
trusses, beams, frames, and space trusses. Prereq:
CIE 681 or permission. 3 cr.

784. Introduction to Project Planning and
Design
Part one of a two-part sequence. Student groups
develop a project statement to address a large­
scale civil engineering system design. Each team
prepares a project plan to be executed in CIE 788,
part two of this sequence. 1 cr.

785. Introduction to Structural Vibrations
Dynamic analysis of single- and multi-degree-of­
freedom systems. Simple beam and frame struc­
tures. Earthquake analysis and design. Pre­
coreq: CIE 783. 3 cr.
786. Introduction to Finite Element Analysis
Topics include matrix theory, Galerkin method, direct stiffness method, development of finite element theory, and modeling techniques, applications in solid mechanics, heat transfer, fluids, and dynamics using commercially available codes. Prereq: CIE 681, 783; or permission. 3 cr.

787. Dynamics of Structures
Dynamics of single- and multi-story buildings. Response due to earthquakes, blasting, traffic, and mechanical equipment. Analysis in the time domain and through the Fourier Transform. Fundamentals of structural vibration measurement. Prereq: CIE 785 or permission. 3 cr.

788. Project Planning and Design
Student groups are formed into design teams to prepare a design plan for a large-scale civil engineering system including consideration of budgetary constraints, building code criteria, and environmental impacts. Each team prepares a final written report and gives a formal presentation. Prereq: CIE 784. Writing intensive. 3 cr.

791. Prestressed Concrete
Analysis and design of prestressed and post-tensioned concrete sections in flexure and shear. Strength, deflection, and losses in flexural members. Optimization of section and prestress force selection. Prereq: CIE 774 or permission. 3 cr.

792. LRFD Bridge Design
AASHTO LRFD Bridge Design Specifications using SI units. Design objectives, loads, load case analysis and selection, load distributions, static analysis, and design for axial loads, flexure, and shear. Design of slender columns, composite, beams, and plate girders. Prereq: CIE 774. Prerequisite Coreq: CIE 790 or permission. 3 cr.

793. Structural Design in Steel
Design of members and connections: tension and compression members, beams, beam/columns, bolted and welded joints. Prereq: CIE 622, 681; or permission. 3 cr.

795. Independent Study
Seniors in good standing may pursue independent studies under faculty guidance. A written culminating report is required. Prereq: permission. 1 to 4 cr.

796. Special Topics
Advanced or specialized topics not normally covered in regular course offerings. May be repeated, but not in duplicate areas. Prereq: permission. 1 to 4 cr.

799H. Senior Honors Thesis
Students in the honors program in civil engineering complete a project under the direction of a faculty sponsor resulting in a written thesis which must be accepted by the sponsor by the end of the second semester, senior year. Four credits total which may be used to fulfill a CIE non-design elective. 4 cr.

Classics (CLAS)

444. Individual and Society in the Ancient World
This class examines one of the major issues faced by people throughout history, whether and under what circumstances an individual should act against the wishes of society. The great philosophical and historical works of the ancient world shed light not only on how the Greeks and Romans approached the idea of personal responsibility but also on the assumptions we today make about human nature and the relationships on which society depends. No prior knowledge of the ancient world required. All readings are in English. Writing intensive. 4 cr.

500. Classical Mythology: Topics in World Literature
Topics are chosen to introduce students to major themes and genres. (Also offered as FREN 500, GER 500, ITAL 500, PORT 500, RUSS 500, SPAN 500.) May be repeated for credit. Writing intensive. 4 cr.

506. Introduction to Comparative and Historical Linguistics
Major language families (primarily Indo-European) and the relationships among the languages within a family. Diachronic studies, methods of writing, linguistic change, glottochronology, etymological studies. Some language training and LIN 505 desirable. (Also offered as LIN 506.) 4 cr.

525. Greek and Latin Origins of Medical Terms
Study of medical terminology. Exercises in etymology and the development of vocabulary in a context at once scientific, historical, and cultural. No knowledge of Greek or Latin is required. Useful to premedical, prepharmacy, nursing, medical technology, and other students in the biological and physical sciences. Open to all students. Special fee. 4 cr.

550. Women in Antiquity
The impact of women on society in Greece and Rome throughout Antiquity. The role of women in public, religious, and private life as well as their legal status through law codes. Men's views of women in different literary texts. Especially concentrating on the few existing texts written by women. All readings are in English. No prerequisite. Special fee. Writing intensive. 4 cr.

595, 596. Topics
Introduction and elementary study related to linguistic study of Latin and Greek or relevant to Greco-Roman culture and history. Primarily for students unprepared to read Latin and Greek. Topics: A) Byzantine Heritage; B) Grammar: Comparative Study of English and the Classical Languages; C) Greek and Latin Origins of Legal Terms; D) Greek and Latin Origins within the English Language; E) Classical Backgrounds of Modern Literature; F) Classical Archaeology. 4 cr.

694. Supervised Practicum
Participants earn credit for suitable pre-professional activities, including high school outreach, assisting in undergraduate courses and work with professional organizations, museum work. Enrolment limited to juniors and seniors who are Classics, Latin, or Greek majors or minors and have above-average G.P.A.s. Writing assignments are required. Prereq: permission of instructor and program coordinator. Course does not count toward Classical, Latin, or Greek major or minor requirements. May be repeated up to a maximum of 8 credits. Cr/F. 2 or 4 cr.

695, 696. Special Studies
Advanced work in classics. Research paper. Not open to freshmen and sophomores. 2 or 4 cr.
455/455H. Introduction to Mass Communication
Nature, development, and the effects of mass media. Overview of mass communication history and theory. 4 cr.

456/456H. Propaganda and Persuasion
Introduction to theories of propaganda and persuasion. Examination of symbolic strategies designed to secure or resist social and institutional change. Attention given to case studies of social, political, economic, and religious reformation. Special consideration of the ethical ramifications of such efforts. 4 cr.

457. Introduction to Interpersonal Communication
An introduction to the study of the conversational basis of social reality. Presents an overview of interpersonal communication processes and the ways in which they influence the formation of identity, personal relationships, gender, interactional patterns, conflict, culture, and power. Readings and class material from a variety of authors in the communication discipline as well as related fields in the humanities and the social sciences. 4 cr.

503. Introduction to Group Communication Processes
Introduction to the theoretical and empirical foundations of group communication processes in a variety of settings. Comparison of approaches to defining and understanding the pervasiveness, complexity, and diversity of group communication and multi-party interaction in the many spheres of social life. Students undertake hands-on observation, recording, transcription, and analysis of naturally occurring group communication in and out of class. Prereq: CMN 457 with C or better, or by permission. 4 cr.

504. Introduction to Argumentation
Persuasive discourse as inquiry and advocacy grounded in practical inductive and deductive reasoning. Discovery, analysis, and testing of practical arguments. The nature and function of proof. Some emphasis on applied presentation. Prereq: CMN 456 with C or better, or by permission. 4 cr.

#505. Analysis of Popular Culture
Locates the development of popular cultural artifacts and practices within the 20th-century social history of the U.S. Examines the political-economic forces that underpinned the commercialization of art, leisure, sports, and other elements of culture in industrial and postindustrial America. Prereq: CMN 455 with C or better, or by permission. 4 cr.

507. Introduction to Rhetorical Theory and Analysis
Major precepts of rhetorical theory. Application of those precepts in analysis and understanding of a wide range of human communication. Consideration of how precepts and issues of rhetorical theory apply to contemporary issues and problems. Prereq: CMN 456 with C or better, or by permission. 4 cr.

515. Analysis of News
Explores the psychological, social, economic, political, and cultural factors that influence the definition and reporting of news. Prereq: CMN 455 with C or better, or by permission. 4 cr.

519. Advertising as Social Communication
Social role of advertising, public policy debates concerning advertising, influence of advertising on culture, and methods of analyzing advertising messages. Prereq: CMN 453 with C or better, or by permission. 4 cr.

530. Family Communication
Exploration of the patterned communication in families and the ways in which our understanding of these patterns can be utilized to understand and transform unwanted family interactions. Varying cultural discourses of family communication are used to explore the dialogic construction of family and self. Prereq: CMN 457 with C or better, or by permission. 4 cr.

550. Cinema and Society
The art, history, technology, economics, and theory of moving images from the silent period to the present. Focus on film as a social practice. Examination of both classic Hollywood film and alternative cinema. Students cannot receive credit for both CMN 550 and ENGL 533. Prereq: CMN 455 with C or better, or by permission. Special fee. 4 cr.

557. Great Speakers and Speeches
Historical survey of masterpieces of oratory from the period of Demosthenes and Cicero through the golden age of American oratory with Lincoln and Webster, to the time of Martin Luther King, John Kennedy, and Ronald Reagan. Critical attention to the circumstances, talents, and rhetorical attributes that combine to make eloquent, persuasive discourse and effective public communication. Prereq: CMN 456 with C or better, or by permission. 4 cr.

567. Images of Gender in the Media
The symbolic construction of sexuality and gender in specific social, historical, and cultural settings. Examination of the power to define media images and the media's function as one element in the preservation of gender inequality. Prereq: CMN 455 with C or better, or by permission. 4 cr.

572. Language and Social Interaction
In this mid-level course, students develop the observational and analytic skills necessary for the in-depth study of a variety of everyday and institutional social settings. Settings may include dialogue, multiparty interaction, non-verbal communication and embodiment, identity talk, and communication in organizations. Special attention to developing the reading and research skills used in upper level interpersonal communication courses. Prereq: CMN 457 with C or better, or by permission. 4 cr.

575. Research Practicum
Student engagement through direct participation in faculty research projects. Elective credits which do not count towards the major. Instructor permission required. May be repeated for a maximum of 8 credits. Prereq: CMN 455, 456, 457, and 500-level research course. Prereq: CMN 457 with C or better, or by permission. Cr/F. 1 to 4 cr.

583. Gender and Communication
Consideration of the construction of gender through various linguistic and non-linguistic interpersonal communication practices. Topics include linguistic marking of gender, socialization and communicative management of gender identity, cultural change and variation in the communicative construction of gender, the contestation of gender stereotypes through communication, and a critical examination of theoretical and empirical approaches to gender and communication. Prereq: CMN 457 with C or better, or by permission. 4 cr.

596. Special Topics in Media Studies
Selected topics not covered by existing courses in media studies. Topics vary; course descriptions are available in department office during preregistration. May be repeated for credit if topics differ. Prereq: CMN 455 with C or better, or by permission. 4 cr.

597. Special Topics in Rhetorical Studies
Selected topics not covered by existing courses in rhetorical studies. Topics vary; course descriptions are available in department office during registration. May be repeated for credit if topics differ. Prereq: CMN 456 with C or better, or by permission. 4 cr.

598. Special Topics in Interpersonal Studies
Selected topics not covered by existing courses in interpersonal communication. Topics vary; course descriptions are available in department office during registration. May be repeated for credit if topics differ. Prereq: CMN 457 with C or better, or by permission. 4 cr.

599. Internship
Internships are designed to integrate classroom study and supervised practical experience in a work setting. Each student is required to write a series of reports focusing on aspects of the work experience that are related to coursework in the Communications Department. These assignments are designed to enhance a student's ability to reflect critically on the internship experience and to merge theory and practice. Assignments are available, depending on the number of credits granted (1-4). Students are expected to hold the common exam time (TR, 1240-2) open for occasional assignments. Before starting the internship, students must submit a written proposal to both the work supervisor and the faculty sponsor. The proposal should include detailed information on the duties and responsibilities to be undertaken at the internship site and on the goals and learning objectives as relevant to the Communication Department curriculum. May be repeated for a maximum of 8 credits. Prereq: CMN 455, 456, 457, or permission. Cr/F. 1 to 4 cr.

600. Public Speaking as a Civic Art
Performance course buttressed by the traditional civic art of rhetoric. Focuses on analysis of speaking situations and audiences, message of construction, presentation, and critical evaluation using major precepts of rhetorical theory. Theoretical and critical issues in the context of rhetorical and persuasive practices. Prereq for CMN majors: CMN 455, 456, 457, and 500-level rhetoric course; prereq for non-majors: junior or senior standing. Writing intensive. 4 cr.

602. Theories of Interpersonal Communication
Analysis and criticism of contemporary perspectives on interpersonal communication. Theories and concepts, issues, and research models are examined as they contribute to our understanding of social interaction. Prereq: CMN 455, 456, 457 and any CMN 300-level interpersonal studies course or permission. Writing intensive. 4 cr.

607. Persuasion in American Politics
Study of the forms and strategies of persuasive discourse employed by contemporary American political leaders. Analysis of important political addresses of the 20th century, with attention to theoretical and critical issues in political communication and public address. Discussion of the status of rhetoric in modern politics, and the impact of persuasive discourse on campaigns, policy deci-
sions, crisis management, political scandal, and the national identity. Prereq: CMN 455, 456, 457 and any 500-level rhetorical studies course or permission. Writing intensive. 4 cr.

615. Public Opinion and Mass Communication
Examines the historical development of the 18th century public sphere and its relationship to the press. Traces the transformation of the press from an ideological grounding to a commercial base. Analyzes the consequences of contemporary mass consumer-oriented media on the public sphere and democratic life. Prereq: CMN 455, 456, 457 and any 500-level media studies course. Writing intensive. 4 cr.

630. Psychology of Communication
Recasts human psychology as a communicative accomplishment, offering a critique of the individualist tradition. Emphasis on the ways in which identity, knowledge, values, and beliefs are constructed in daily social engagements and the pragmatic, political, and moral implications of this view. Implications for our major cultural institutions such as education, health, and politics. Prereq: CMN 455, 456, and 457 with C- or better and any required 500-level interpersonal studies course with a C- or better, or by permission. Writing intensive. 4 cr.

640. Media, Culture, and Society
Focuses on the construction of meaning in the interplay between social structure and cultural expression. Theory and analysis emphasize the ideological role of the media in the social struggle for meaning. Prereq: CMN 455, 456, 457 and any 500-level media studies course or permission. Writing intensive. 4 cr.

645. Rhetorical Criticism of Film
Examines the rhetoric of narrative film, with an emphasis on an audience-centered criticism of American feature films, such as historical dramas, sci-fi films, road movies, and documentaries. Also examines how audiences experience films as both consumer and producer of cultural texts. Prereq: CMN 455, 456, 457 and one 500-level media studies course. Writing intensive. 4 cr.

657. Public Address and the American Experience
Study of persuasive texts set firmly in their historical and social contexts. Discussion of the impact of popular discourse on historically significant political and social events. Analysis of how leading persuasive speakers and writers responded to the fundamental questions confronting their age and articulated ideas in a manner that provoked or motivated their community, state, or nation. Historical period studied will vary. May be repeated for credit when topic varies. Prereq: CMN 455, 456, 457 and any 500-level rhetorical studies course or permission. Special fee. Writing intensive. 4 cr.

658. Media Analysis and Criticism
Approaches and methodologies for media criticism. Analysis of sample studies. Students work on original media analysis projects. Prereq: CMN 455, 456, 457 and any two 500-level CMN courses (three 500-level courses recommended) or permission. Writing intensive. 4 cr.

666. Conversation Analysis
Exploration in how participants in interpersonal communication display their orientation to the fundamental orderliness of conversational sequences in everyday, institutional, and mass media settings. Basic concepts covered include the interactional co-construction of turn-taking, repair, overlap, openings, closings, silences, adjacency, pairs, disagreement, preference, and the role of various linguistic, paralinguistic, and nonlinguistic features in the conversation process. Prereq: CMN 455, 456, 457 and one 500-level interpersonal CMN course or permission. Writing intensive. 4 cr.

667. Ethnography of Communication
Theoretical and hands-on consideration of interpersonal communication and language use as culturally situated practices of particular communities, through which human beings reflect, construct, maintain, pass down, and challenge the cultures of which they are a part. Students will learn how to interpret culturally situated interpersonal communication and language use by employing various ethnographic and discourse analytic methods of investigation. Prereq: CMN 455, 456, 457 and one 500-level interpersonal CMN course or permission. Writing intensive. 4 cr.

#672. Theories of Language and Discourse
Selection and critique of major theoretical orientations to the study of language and social interaction as well as of major methodologies for analyzing conversation and interaction in everyday and institutional settings. Prereq: CMN 455, 456, 457 with C- or better and any required 500-level interpersonal studies course (CMN 572 recommended) with C- or better, or by permission. Writing intensive. 4 cr.

680. Perspectives on Culture and Communication
Critical interpretation of culture focused on the communication practices and resources of diverse groups. Examination of the reciprocal relationship between communication practices, forms of culture, and cultural identity. Exploration of the conditions necessary for dialogue between differing cultural groups. Emphasis on the role of communication in constructing race, power, cultural domination, and globalization. Prereq: CMN 455, 456, 457 with C- or better and any required 500-level interpersonal studies course with a C- or better, or by permission. Writing intensive. 4 cr.

696. Seminar in Media Studies
Variable topics in media research, theory, and practice. May be repeated for different topics. Topic descriptions available in department office during preregistration. Prereq: CMN 455, 456, 457 and any 500-level media studies course or permission. Writing intensive. 4 cr.

697/697H. Seminar in Rhetorical Study
Variable topics in rhetorical research, theory, and practice. May be repeated for different topics. Topic descriptions available in department office during preregistration. Prereq: CMN 455, 456, 457 and any 500-level rhetorical studies course or permission. Writing intensive. 4 cr.

698. Seminar Interpersonal Studies
Variable topics in interpersonal research, theory, and practice. May be repeated for different topics. Topic descriptions available in department office during preregistration. Prereq: CMN 455, 456, 457 and any 500-level interpersonal studies course or permission. Writing intensive. 4 cr.

702. Seminar in Interpersonal Communication Theory
In-depth concentration on a particular theoretical orientation in interpersonal communication. Original works are read. Theoretical orientation varies by semester. Prereq: CMN 455, 456, and 457 with C- or better and three required 500-level CMN courses (at least one must be in interpersonal studies) with C- or better, or by permission. Writing intensive. 4 cr.

772. Seminar in Media Theory
Detailed analysis of major theories related to the interaction of communication technologies and society. Application to current examples in politics, advertising, and entertainment. Prereq: at least one 600-level course or permission. Writing intensive. 4 cr.

795/795W. Independent Study
Advanced individual study in rhetoric, media, or interpersonal communication. Project to be developed with supervising instructor. May be repeated for credit. Prereq: permission. 1 to 4 cr.

796. Comm-Entary Journal
Serve on the editorial board of student run communication journal. Elective credit which does not count toward the major. May be repeated for a maximum of 2 credits. Prereq: CMN 455, 456, 457, or permission. Cr/F. 1 cr.

799H. Honors Thesis
Written thesis based on substantial and original research under the direction of a full-time member of the communication faculty. Thesis must be in the form and style of a publishable, scholarly work. Restricted to seniors seeking honors in major. 4 cr.
Communication Sciences & Disorders (COMM)

(For program description, see page 72.)

520. Survey of Communication Disorders
Causes, diagnosis, and treatment of speech, language, and hearing disorders. 4 cr.

521. Anatomy and Physiology of the Speech and Hearing Mechanisms
Anatomy, physiology, neurology, and function of the mechanisms for the production and perception of speech. 4 cr.

522. Acquisition of Language
Introduction to normal language acquisition; stages of children's developing language examined within a linguistic framework with attention paid to syntax, morphology, phonology, semantics, and pragmatics. Theories of language acquisition overviewed. 4 cr.

524. Clinical Phonetics
Application of the International Phonetic Alphabet to normal and clinical populations; use of broad and narrow transcriptions. Basic speech science, acoustic phonetics, and acoustic analysis of speech production. 4 cr.

533/533A. Elementary American Sign Language
Introduction to the vocabulary, finger spelling, grammatical processes, phonology, syntax, and semantics of American Sign Language. Emphasis on applying principles of sign language; psycho-social aspects of deafness, and the deaf person as bilingual; grammatical processes that modulate meaning of sign in discourse; development of receptive language skills. 4 cr.

536. Introduction to Deaf Studies
This course addresses various aspects of the deaf community, including the value of American Sign Language and the culture it reflects, professions within the deaf community, legislation affecting deaf people, educational approaches and controversies, activities and events relating to the population, and hearing-related issues. 4 cr.

537. Deaf Culture
This course examines deaf culture from a multi-disciplinary perspective. The historical treatment of deaf individuals is explored within a sociological and cultural context as a backdrop to the emergence of deaf culture. Course content includes minority group dynamics, education of the deaf, the deaf community as a linguistic and cultural minority, and the importance of deaf culture. 4 cr.

630. Organic Pathologies
Neurological bases, diagnosis, and treatment of communication disorders; emphasis on motor speech disorders and aphasia. Prereq: permission. 4 cr.

631. Articulation and Language Disorders in Children
Research, diagnosis, and therapy procedures as applied to articulation and language disorders. 4 cr.

635. Professional Issues in Speech-Language Pathology
Introduction to the profession of speech-language pathology; review of issues related to scope of practice; professional ethics, certification/licensure, and current challenges facing the profession. Discussion of employment opportunities for speech-language pathologists. Writing intensive. 4 cr.

637. Multicultural Issues in Communication Disorders
The purpose of the course is to allow students to become informed about the complexity and the ways in which cultures differ. The students develop a comprehensive understanding of, cross cultural sensitivity to, and competence of one's own culture and the characteristics of the four major cultural groups in the United States. The students also develop intercultural skills for assessing and counseling individuals as mandated by our professional association policies and positions on language diversity in the clinical management of clients from diverse cultural and linguistic backgrounds. 4 cr.

660. Special Problems
Individual or group projects to enrich or expand theoretical knowledge and to afford an opportunity for applied experience. May be repeated to a maximum of 8 credits. Prereq: permission and arrangement with faculty. 2 to 8 cr.

704. Basic Audiology
Normal hearing process and pathologies of the auditory system. Hearing screening, pure-tone testing, and speech audiometry. Prereq: COMM 521 or permission. 4 cr.

705. Introduction to Auditory Perception and Aural Rehabilitation
Research, testing, and clinical procedures of auditory perception, applied to the communicatively impaired. Prereq: COMM 704; permission. 4 cr.

723. Observation Skills in Speech-Language Pathology
Guided observation experiences familiarize students with the clinical process; develop systematic observation skills; fulfill observation requirement of the American Speech-Language-Hearing Association (ASHA). Writing intensive. 2 cr.

733/733A. Intermediate American Sign Language
Emphasis on the advanced linguistic principles of American Sign Language including idioms slang and its place in the communication pattern of the deaf. Improvement of speed and accuracy in receptive and expressive skills for communicating with the deaf. Educational and vocational problems associated with deafness. Prereq: COMM 533 or its equivalent; juniors and seniors only. 4 cr.

734. American Sign Language III
Builds upon the information covered in Introductory ASL I and II. Development of basic grammatical rules, vocabulary, manual alphabet/numbers, visual-gestural communication, and information related to Deaf Culture are covered. All lectures, laboratory activities, outside assignments build upon rudimentary competency in receptive and expressive use of ASL and develop fluency and competency. Class is conducted using ASL only. Prereq: American Sign Language I and II. 4 cr.

735. American Sign Language IV
Build upon the information covered in Introductory ASL I, II, and III. Development of basic grammatical rules, vocabulary, manual alphabet/numbers, visual-gestural communication and information related to Deaf Culture are covered. All lectures, laboratory activities, outside assignments build upon rudimentary competency in receptive and expressive use of ASL and develop fluency and competency. Class is conducted using ASL only. Prereq: American Sign Language I, II, and III. 4 cr.

736. Clinical Assistant
This course is designed for seniors who are majoring in Communication Sciences and Disorders (CS&D). This course offers an opportunity to gain pre-professional clinical experience by serving as an assistant to a graduate clinician who is participating in a practicum at the UNH Speech-Language-Hearing Center. Clinical assistants will be able to take an active part in the treatment of an individual with a communication delay, disorder or difference. The undergraduate's role in the clinical process will be contingent upon his or her level of training and assigned responsibilities. The supervising clinical faculty is responsible for overseeing the intervention program. Prereq: Seniors who are majoring in CS&D and have a GPA of 3.3 or above. Permission of the instructor is required. Enrollment is limited and varies each semester depending on the number of clients available. 2 cr.

738. Linguistics of American Sign Language
This course provides linguistic study of the major structural aspects of phonology, morphology, syntax, lexicology, and discourse in American Sign Language. Concepts of language variation, dialect, creolization, and bilingualism are studied. Taught primarily in ASL. Prerequisites/Proficiencies: COMM 733. Elementary American Sign Language II, Minimum grade of C. 4 cr.

739. Introduction to Aphasia in Adults
The course introduces the student to the relationship of brain and language and the resulting language processing problem following cerebral vascular accident (CVA). Differential diagnosis of language symptoms and treatment strategies are discussed and observed in clinical situations. Permission required. 4 cr.

740. Treatment of Adults with Acquired Brain Injury
This "hands-on" interdisciplinary experience enables students to acquire clinical skills and professional competence in a community-based day program where they assist adults with acquired brain injuries to meet their physical, emotional, cognitive-linguistic, social, spiritual, recreational, and vocational needs. Permission required. 4 cr.

775. Advanced Language Acquisition
Careful examination of theoretical perspectives and landmark studies provides the foundation for the exploration of advanced topics in language acquisition. Current approaches to child language research guide students to approach the course content from a scientific perspective. Prereq: COMM 522, permission. 4 cr.

777. Speech and Hearing Science
Physical, acoustical, and perceptual correlates of normal speech production and audition. Includes theoretical models with the generation, transmission, detection, and analysis of speech signals. 4 cr.

779. Deaf and Hard of Hearing Internship
The internship will allow students in the Deaf and Hard of Hearing Minor to expand their knowledge about the needs, challenges, and the experiences of deaf and hard of hearing individuals. The internship locations will be varied and matched, as closely as possible, to the student's particular interests. Potential placement opportunities include a school for the deaf, a public agency or vocational setting which provides services for deaf and hard of hearing individuals. Prereq: COMM 533, COMM 536, and COMM 733; permission. Cr/F 4 cr.
795. Independent Study
Individual or group projects involving directed study of an area of communication disorders that students wish to explore in greater depth than is covered in the required curriculum. May be repeated to a maximum of 8 credits. Prereq: permission. 1 to 8 cr.

798. Special Topics
New or specialized topics not covered in regular course offerings. 1 to 4 cr.

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Community & Environmental Planning (CD)
(For program description, see page 91.)

415. Community Development Perspectives
Introduces the concepts of community development and issues that are facing contemporary communities as they undergo change. Focus on strengthening communities through a process of citizen participation and decision making which empowers citizens to direct and control change that affects their lives in the local community. Emphasis given to the roles and responsibilities of professional administrators and individual citizens in the dynamic process of community policy formulation, decision making, and administrative implementation. 4 cr.

508. Applied Community Development
Students work in an actual community, assisting individuals and groups to identify needs and problems, establish attainable and objective goals, assess requirements and resources, and formulate programs for development and methods of collection, analysis, and integration of pertinent primary and secondary economic, social, political, and physical data for community development. Prereq: CD 415 or permission. Lab 4 cr.

614. Fundamentals of Planning
Community planning process in nonmetropolitan community as a practical application of planning techniques. Community components: housing, jobs, schools, recreation, transportation, community appearance, and the administrative structure for planning. Use of planning tools: data gathering and analysis, the master plan, zoning and subdivision regulations, community development programs. Prereq: EREC 411; CD 415 or permission. (Offered every other year.) Writing intensive. 4 cr.

739. Community Administration Internship
Fieldwork in governmental agency or a local government unit for on-the-job skill development. Normally supervised by a qualified administrator in the organization with frequent consultation with a faculty sponsor. A written report is required. Internship may be part- or full-time with course credit assigned accordingly. Prereq: permission. Cr/F. 1 to 8 cr.

794. Community Planning Internship
Fieldwork in a public planning office or agency for on-the-job skill development. Normally supervised by a qualified planner in the planning organization with frequent consultation with a faculty sponsor. A written report is required. Internship may be part- or full-time with course credit assigned accordingly. Prereq: permission. Cr/F. 1 to 8 cr.

795/795W, 796/796W. Investigations
Special assignments in readings, investigations, or field problems, or teaching experience. May be repeated. Prereq: permission. 2 to 4 cr. 795W and 796W are writing intensive.

797. Community Administration and Planning Seminar
Selected topics in community administration and in community and regional planning. Focuses on current issues of major importance that are not usually covered in regular community administration to a maximum of 8 credits. Prereq: permission. Special fee. 1 to 4 cr.

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Computer Science (CS)
(For program description, see page 59.)

400. Exploring Computer Science
A gentle introduction to computer science, focusing on the Internet. Students are introduced to Web design, HTML authoring, and JavaScript programming. In addition, the field of computer science is surveyed. Ideal for students who want to explore what computer science is all about. Laboratory sessions provide hands-on experience. No previous experience with computers is required. 2 cr.

401/401H. Computer Applications
Use of computers to manage and analyze information across a variety of settings and disciplines. Introduces major categories of software for large and small computer systems and discusses the computer’s role in today’s society. No prior computer experience required. Significant hands-on work in computer labs and on the Internet. Not open to students who have completed DCE 491 or 492. Not open to CS majors. CEPS students should check with their major department for approval. 4 cr.

402. Survey of Computer Science
Explores the core concepts of computer science, including computer architecture, operating systems, relationship between hardware and software, communications and networks, and data representation. Programming languages and concepts, algorithm analysis, database systems, graphics, and ethics will also be discussed. Not open to CS majors. 4 cr.

403. Online Network Exploration
Introductory course covering basic topics relating to the Internet. Subjects discussed include e-mail, newsgroups, mailing lists, file transfer, telnet, the World Wide Web, Web browsers, search engines, and hypertext markup language (HTML). A large portion of the course focuses on Web publishing. Security and privacy issues, and commerce and legal issues are also discussed. Students are expected to have no previous experience with HTML. They will acquire new skills as well as broad understanding of the technical possibilities of living and working in an online society and its implications. No credit if credit earned for CIS 405. 4 cr.

405. Introduction to Applications Programming with Visual Basic
Introduces the concepts and techniques of microcomputer windows programming. Students use the Visual Basic language to develop modular, event-driven programs/applications. Topics include: forms, properties, controls, variables, decision structures, and built-in and user-defined functions and subroutines. CEPS students should check with their major department for approval. Not open to CS majors. 4 cr.

407. Introduction to Computer Programming with Java
Introduces the concepts and techniques of computer programming, including basic data structures such as lists, stacks, and queues. The topics include control structures, file manipulation, recursion, and an introduction to graphic user interface design. Introduces object-oriented design and analysis, including class definition and use, inheritance, and polymorphism. Good programming style is stressed. Significant out-of-class programming required. Not open to students who have had CS 410, 412, 415, or the equivalent. 4 cr.
401. Introduction to Scientific Programming
Introduces the concepts and techniques of computer programming. Particular emphasis on computer programming as a problem-solving technique in science and engineering applications. The C language is taught and used for assignments. Good programming style is stressed. Significant out-of-class programming is required. Not open to students who have completed CS 407, 415, or the equivalent. Pre- or Coreq: MATH 425. 4 cr.

415. Introduction to Computer Science I
Theory and practice of computer science. Algorithm development and analysis; data abstraction techniques; elementary data structures; dynamic memory manipulation; debugging; and program design issues. Computer systems and applications. Intended for CS majors. 4 cr.

416. Introduction to Computer Science II
See description for CS 415. 4 cr.

502. Intermediate Web Design
An intermediate level exploration of the theory and practice of Web design. Students learn the fundamentals of design theory applicable to the World Wide Web and examine tools and techniques for applying that knowledge to their projects. Additional topics include information architecture, usability, accessibility, optimization, typography, and market visibility. Working knowledge of XHTML and CSS required. Prereq: CS 403. 4 cr.

503. Introduction to Web Programming
Introduces the concepts and techniques of client-side development for the World Wide Web. Students will be taught the basics of programming and how to apply that knowledge to enhance Web pages. Topics include variables, control structures, functions, events, objects, user feedback, form handling, and the Document Object Model. Significant out-of-class programming required. Prereq: CS 404 4 cr.

504. Intermediate Web Development
An intermediate-level examination of the theory and practice of developing applications for the World Wide Web. Students will learn practical techniques for designing and implementing Web applications, with a particular emphasis on server-side processing and data-driven Web sites. Working knowledge of XHTML, CSS, and some programming language is required. Prereq: CS 403 and programming course. 4 cr.

505. Database Programming
Introduces database programming in the microcomputer environment. Students use a procedural programming language such as Visual Basic to manipulate data managed by a database management system. Emphasis is on the relational database model. Topics include connections, queries (including use of SQL), relations, constraints, transaction processing, concurrency issues, exception handling, and report generation. Prereq: a programming course. 4 cr.

506. Intermediate Applications Programming with Visual Basic
Introduction to advanced Visual Basic data structures, focusing on the language's object-oriented features. Topics include the creation of programmer-defined classes and objects, collections, user controls, exception handling, regular expressions, database programming, and Web forms. Prereq: CS 405. 4 cr.

509. Network/System Administration
Introduces the central issues in administration of a networked computer system. Topics include the client-server model (including support of mail, FTP, Telnet, the Web), disk and file systems, backup and recovery, and security. Privacy and other legal/social issues will be discussed. Prereq: CS 402 and a programming course, or permission of the instructor. 4 cr.

515. Data Structures
Reviews basic data structures; advanced data structures such as graphs, B-trees, and AVL trees; abstract data structure design and programming techniques; use of data abstraction language. Introduction to algorithm analysis. Prereq: CS 416. 4 cr.

516. Introduction to Software Design and Development
Principles of problem analysis and solution design applied to the development cycle of a software system (i.e., from system requirements specifications to design, implementation, and system test). Experience in understanding and debugging existing software systems. Prereq: CS 515. 4 cr.

520. Assembly Language Programming and Machine Organization
Assembly language programming and machine organization: program and data representation; registers, instructions, and addressing modes; assemblers and linkers. Impact of hardware on software and software on hardware. Historical perspectives. Prereq: CS 515. 4 cr.

595. Computer Science Seminar
Students read literature about computer sciences, makeoral presentations about the literature to other members of the class, and discuss the issues raised in class. The literature includes both technical and non-technical topics about computer science, including social issues related to computing and ethics in the computer science profession. Prereq: CS 516. 2 cr.

600. Internship
Provides opportunity to apply academic experience in settings associated with future professional employment. A written proposal for the internship must be approved by the department chair. The proposal must specify what the student will learn from the internship, why the student is properly prepared for the internship, and what supervision will be available to the student during the internship. A mid-semester report and a final report are required. Prereq: permission. Cr/F. 1 cr.

620. Operating System Fundamentals
Introduces operating system concepts and design. Job, process, and resource management; scheduling; file systems; interprocess communication. Prereq: CS 515 and CS 520 or ECE 612. 4 cr.

645. Introduction to Formal Specification and Verification
Mathematical reasoning can be applied to study the behavior of software systems, an approach that is particularly relevant to critical systems. This can be achieved through the description of those systems along with their properties in formally defined, logically-based languages. Introduces techniques relevant to the application of formal specification and verification methods, including symbolic logic and proof techniques related to program correctness. Prereq: CS 516, MATH 531, MATH 532. 4 cr.

659. Introduction to the Theory of Computation
Review of sets, relations, and languages. Induction and diagonalization. Finite automata, context-free languages, pushdown automata. Basic complexity theory. Prereq: MATH 531 and 532; CS 515. 4 cr.

671. Programming Language Concepts and Features
Explores the main features of modern, high-level, general-purpose programming languages from the user (programmer) point of view. Provides students with an opportunity to use noninteractive programming paradigms, such as object-oriented, functional, and logical, and to learn how specific features of such languages can be used efficiently in solving programming problems. Prereq: CS 516. 4 cr.

696/696W. Independent Study
Individual projects developed and conducted under the supervision of a faculty member. Prereq: permission of faculty supervisor and department chairperson. May be repeated for credit. 1 to 6 cr. 696W is writing intensive.

712. Compiler Design
Formal languages and formal techniques for syntax analysis and parsing; organization of the compiler and its data structures; problems presented by error recovery and code generation. Classical top-down and bottom-up techniques currently in widespread use, general discussion of LL(k) and LR(k) parsers; automatic methods of compiler generation and compiler compilers. Students required to define a simple, nontrivial programming language and to design and implement its compiler. Prereq: CS 520 and CS 671. 4 cr.

719/719W. Object-Oriented Methodology
Object-oriented system design and programming. Languages for object-oriented programming. Design intensive. Prereq: CS 671 or permission. 4 cr. 719W is writing intensive.

720. Operating System Programming
Detailed discussion of operating system concepts and features. Practical examples and exercises that utilize advanced operating system features, including interprocess communication, synchronization, client-server communication, shared memory, threads, remote procedure calls, and device-level I/O. Discussion of POSIX 1003.1 Part I Standards. Prereq: CS 516 and CS 620. 4 cr.

721. Operating System Kernel Design
Design and implementation of an operating system kernel, using LINUX as an example. Detailed discussion of the data structures and algorithms used in the kernel to handle interrupts, schedule processes, manage memory, access files, deal with network protocols, and perform device-level I/O. Course is project-oriented, and requires the student to make modifications and additions to the LINUX kernel. Prereq: CS 720 or permission. 4 cr.

724. Distributed Operating Systems
Fundamental concepts, algorithms, and design principles that form the basis of distributed and multiprocessor operating systems. Architectural overview, design, and implementation methodology of several real distributed systems. Prereq: CS 516 and CS 620. 4 cr.

725. Computer Networks
Introduces local, metropolitan, and wide area networks using the standard OSI Reference Model as a framework. Introduces the Internet protocol suite and network tools and programming. Discusses various networking technologies. Prereq: CS 516 and CS 620. 4 cr.
Intelligence search techniques, knowledge representation, intensive.

730W. Introduction to Artificial Intelligence
In-depth introduction to artificial intelligence, concentrating on aspects of intelligent problem-solving. Topics include situated agents, advanced search techniques, knowledge representation, logical reasoning techniques, reasoning under uncertainty, advanced planning and control, and learning. Prereq: CS 671. 4 cr. 730W is writing intensive.

760W/760W. Introduction to Human-Computer Interaction
Human-computer interaction is a discipline concerned with the design, evaluation, and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. Prereq: CS 516 and CS 620. 4 cr. 760W is writing intensive.

765W/765W. Introduction to Computational Linguistics
Introduces computational analysis of natural language with a focus on semantic representations and the resolution of ambiguity. Provides an elementary working knowledge of linguistic and artificial intelligence analysis methods as motivated by examples of potential input texts. Topics include parsing, formal grammars, representation of knowledge and memory, inference, and interpretation of nonliteral language. Prereq: elementary knowledge of LISP or instructor's permission. 4 cr. 765W is writing intensive.

770W/770W. Interactive Data Visualization
Detailed discussion of how an understanding of human perception can help us design better interactive displays of data. Topics include color, space perception, object perception and interactive techniques. Students write interactive programs, give presentations and undertake a project designing and evaluating a novel display technique. Prereq: instructor's permission. 4 cr. 770W is writing intensive.

775. Database Systems
Database analysis, design, and implementation. Focus on the relational model. Data description and manipulation languages, schema design and normalization, file and index organizations, data integrity and reliability. Usage of selected DBMS. Prereq: CS 671 and MATH 531. 4 cr.

780. Topics
Material not normally covered in regular course offerings. May be repeated for credit. 4 cr.

**Decision Sciences (DS)**
*(For program description, see page 107.)*

#360. Quantitative Methods
Introduces quantitative methods and how these methods serve as input to the decision-making process. The topics covered include linear programming problem foundation and solution, sensitivity analysis, network models, integer programming, goal programming, and forecasting. Prereq: WSBE majors only; all Group A courses and junior standing. 4 cr.

#650. Operations Management
Introduces planning and analysis of operational problems in the manufacturing and service sectors; strategy standards, capacity, inventory, scheduling, and planning and control systems. Prereq: WSBE majors only; all Group A courses and junior standing. 4 cr.

698. Topics
Special topics; may be repeated. Prereq: permission. 4 cr.

741. Private Equity/Venture Capital
This course will notably increase knowledge and understanding of the private equity financing market, develop analytical skills in evaluating private equity financing details, learn from the experience of market practitioners, and enhance oral and written presentation skills. Prereq: ADMN 601 and senior standing. 4 cr.

742. Internship in Entrepreneurial and Management Practice
Involves working for leading companies and dynamic entrepreneurs, as well as classroom instruction. The priority experiential, real-world, and real-time learning in the high-growth environment of entrepreneurial ventures. Focus on several topic areas, including venture capital. Prereq: senior standing; permission. (Also listed as MGT 742.) 4 cr.

754. Resource Management
Analysis and development of resource management planning and control systems. Topics include inventory management, material requirements planning, and capacity management. Prereq: ADMN 640 or permission. 4 cr.

#755. Manufacturing Management
Analysis and development of manufacturing management planning and control systems. Topics include production planning, master scheduling, distribution, and production activity control. Prereq: ADMN 640 or permission. 4 cr.

773, Managing Information Across Enterprise
Provides students with the skills necessary to understand the database environment of the firm and a background to develop moderately complex, stand-alone databases. Gives the foundation to study database development in multi-user, client/server environments. Prereq: senior standing. 4 cr.

774. E-Business Strategies and Solutions
Covers the concepts, tools, and strategies for understanding the challenges and exploiting the opportunities associated with e-commerce/e-business. Provides an understanding of the technology platform and its components. Additional material covers various models of e-commerce/e-business and its impacts on the firm's performance. Prereq: senior standing. 4 cr.

775. Corporate Project Experience
Provides real-life experience in organizations. Work in groups on information systems projects identified by sponsoring organizations. Integrate concepts and skills learned in prior business and technology courses. Learn project management concepts, work with project management tools, and use presentation techniques. Prereq: senior standing. 4 cr.

780. Systems Analysis and Design
Gain appreciation and knowledge expected of a systems analyst; perform cost/benefit analysis of new systems, comparison of alternative means of system acquisition, such as commercial off-the-shelf software; gain experience in structured analysis techniques; understand important issues of project management. Prereq: senior standing. 4 cr.

798. Topics
Special topics; may be repeated. Prereq: permission. 4 cr.

**Earth Sciences (ESCI)**
*(For program description, see page 60.)*

400. Freshman Field Seminar
A field introduction for new or prospective majors to New Hampshire's mountains, rivers, estuaries, and beaches. Field excursions (approximately five) are scheduled on Friday afternoons. Cr/F. 1 cr.

401. Principles of Geology
The Earth, earth materials (rocks and minerals), landforms, and the processes that form them (volcanism, earthquakes, glaciation, etc.). Field trips. Special fee. Lab. Students may not receive credit for both ESCI 401 and ESCI 409. 4 cr.

402. Earth History
Introduces basic geological principles. Uses case studies to illustrate scientific methods used in reconstructing Earth's evolution through time. Topics include the origin of the Earth, the Cambrian explosion of life, building of the Appalachians, assembly of Pangaea, the rise and fall of dinosaurs, the formation of the Rocky Mountains, mammalian evolution, Pleistocene glaciation, and human origins. Special fee. Lab. 4 cr.

405. Global Environmental Change
Human activity rivals nature as an agent of change in the global environment. Explores evidence of environmental degradation in Earth's crust, hydrosphere, and atmosphere; considers prospects for future sustainable human health, diversity, and economic development. Problem solving through critical analysis of environmental variables. Special fee. Lab. 4 cr.

409. Environmental Geology
Environmental impact of geologic processes; natural hazards, landslides, earthquakes, volcanoes, flooding, erosion, and sedimentation; land exploitation and site investigations; environmental considerations of water-supply problems; the recovery of energy and mineral resources. Special fee. Lab. Students may not receive credit for both ESCI 401 and ESCI 409. 4 cr.

420. Our Solar System
Exploration of the solar system with emphasis on the physical and chemical processes relevant to planetary formation and evolution. 4 cr.
501. Introduction to Oceanography
Physical, chemical, geological, and biological processes in the sea. Special fee. Lab. 4 cr.

512. Principles of Mineralogy
Natural history of the solid state; introductory crystallography, diffraction, and structure of minerals. Silicate minerals; their chemical and physical properties, origins, occurrences, and uses. Nonsilicates. Prereq: CHEM 401, 403, or 405. Field trips. Special fee. Lab. 4 cr.

514. Introduction to Climate
The climate as a system controlled by the fluid, chemical, geological, and biological dynamics of the earth. Investigation of natural and man-made climate change over the period of 100 to 100 million years, including the greenhouse effects, tectonic climate forcing, astronomical (Milankovich) cycles, deep ocean circulation, and biological feedback. How past climate is measured. Prereq: one introductory course in Earth Sciences or permission. 3 cr.

530. Field Methods
Standard geological field-mapping techniques, including pace and compass and plane table and alidade; bedrock and surficial mapping on topographic and aerial photographic bases in local areas; one 3- to 4-day exercise in a selected area of the Northern Appalachian Mountains. Prereq: ESCI 401 or 409; 402. Special fee. Writing intensive. 4 cr.

534. Techniques in Environmental Sciences
Elementary mapping and monitoring methods. Map interpretation, preparation of maps; survey techniques including pace and compass, leveling, and global positioning systems; environmental monitoring. Field lab. Cannot receive credit if taken after receiving credit for ESCI 530 or NR 542. Special fee. 2 cr.

561. Surficial Processes
Processes leading to the development of landforms, chemical and mechanical weathering of earth-surface materials and erosion in colluvial, fluvial, glacial, and coastal systems. Field trips. Prereq: ESCI 401 or permission. Special fee. Lab. 4 cr.

595, 596. Introductory Investigations
Special topics by means of lectures, conferences, assigned readings, and/or field or laboratory work in the areas of geology, hydrology, or oceanography. 1 to 4 cr.

614. Optical Mineralogy and Petrography
Description and classification of igneous, sedimentary, and metamorphic rocks in hand specimen and thin section; optical mineralogy. Prereq: ESCI 512. Special fee. Lab. 4 cr.

631. Structural Geology
Structural units of the Earth's crust and mechanics of their formation. Prereq: ESCI 530. Special fee. Lab and fieldwork. 4 cr.

652. Paleontology
Use of the fossil record to address current problems in Earth history, paleoecology, and evolutionary biology. Examples are drawn from both vertebrates and invertebrates. Lab combines analytical paleontological methods with a systematic survey of important fossil groups. Prereq: ESCI 402 or permission. Special fee. Lab. 4 cr.

654. Fate and Transport in the Environment
Introduces the basic processes controlling the migration and transformation of chemicals in surface water, groundwater, and the atmosphere; basic models of advection, dispersion, retardation, and attenuation. Prereq: CHEM 404, MATH 426. 4 cr.

658. Principles of Earth, Ocean, and Atmospheric Dynamics
Introduces the basic elements of kinematics and dynamics, relevant to processes important in earth, ocean, and atmospheric sciences. Reviews particle dynamics and introduces continuum mechanics of the solid earth, hydrologic, and environmental fluid systems. Includes biweekly laboratories and homework problem recitation sessions. Prereq: MATH 426, PHYS 407. 4 cr.

703. Fluvial Hydrology
Mechanics of natural open-channel flows: forces, the continuity and energy principles, velocity distributions, flow resistance, fluvial erosion and sediment transport, channel form, computation of flow profiles, weirs, hydraulic jumps, and stream-flow measurement. Lab and field exercises. Prereq: one year each of calculus and physics. Special fee. 4 cr.

705. Principles of Hydrology
Basic physical principles important in the land phase of the hydrologic cycle, including precipitation, snowmelt, infiltration and soil physics, evapotranspiration, and surface and subsurface flow to streams. Problems of measurement and aspects of statistical treatment of hydrologic data. Field trips. Prereq: MATH 425 or MATH 424 and PHYS 402. Special fee. Writing intensive. 4 cr.

710. Groundwater Hydrology
Principles for fluid flow in porous media with emphasis on occurrence, location, and development of groundwater but with consideration of groundwater as a transporting medium. Major topics include well hydraulics, regional groundwater flow, exploration techniques, and chemical quality. Laboratory exercises involve use of fluid, electrical, and digital computer models to illustrate key concepts. Prereq: ESCI 705 or permission. Special fee. Lab. 4 cr.

715. Global Atmospheric Chemistry
Introduction to the principles of atmospheric chemistry and their relationship to biogeochemical cycles, climate, and global change. Focus is on understanding the basic physical and chemical processes that determine the trace gas distribution in the global troposphere. An introduction to atmospheric vertical structure and global circulation dynamics provides the foundation. Then chemical cycles of important C, S, N molecules are examined, including their possible perturbation by human activities. Basic photochemical processes are outlined, particularly with respect to reactive nitrogen, hydrocarbons, and the production/destruction of ozone. Prereq: one year chemistry. 3 cr.

716. Atmospheric Aerosol and Precipitation Chemistry
Describes and examines the processes determining the chemical and physical characteristics of atmospheric aerosol particles and precipitation. Important fog include the role of aerosol particles in the long-range transport and deposition of geochemical materials, optical properties of these particles and their impact on the global radiative balance, cloud microphysical processes relevant to both radiative effects and precipitation scavenging, and heterogeneous reactions at the solid-liquid, solid-gas, and liquid-gas interfaces in the atmosphere. Major segments of the course are devoted to the removal of gases and particles from the atmosphere by wet and dry deposition processes. Focuses on processes active in the troposphere, but important differences between the troposphere and stratosphere, radiative effects of stratospheric aerosol particles, and exchange between the troposphere and stratosphere are addressed. Prereq: one year college chemistry or permission. 3 cr.

717. Macro-scale Hydrology I
Focus on the numerous roles of water in the Earth system. Topics include the global water cycle, impacts of the greenhouse effect and other anthropogenic disturbances, hydrologic modeling, soil-vegetation-atmosphere transfer schemes, water quality, GIS and water-related remote sensing tools, global freshwater resources. Course is organized around formal lectures, in-class discussion, student presentations, class projects. Prereq: ESCI 705 or permission. (Offered alternate years.) 4 cr.

718. Macro- Scale Hydrology II
A continuation of ESCI 717. Students and instructor jointly select a research topic in macro-scale hydrology to be analyzed in-depth during the course of the semester. A primary goal is the preparation of a manuscript for publication in a refereed scientific journal. Extensive library research, reading of recent and relevant scientific literature, technical analysis and writing. Prereq: ESCI 717. (Offered alternate years.) 4 cr.

725. Igneous Petrology
The evolution of igneous rocks as determined from field, petrographic, chemical, experimental, and theoretical studies. Application of thermodynamics to igneous petrogenesis. Physical properties of magmas. Prereq: mineralogy; petrography; adequate background in calculus, chemistry, and physics. Field trips. Special fee. Lab. (Offered in alternate years with ESCI 726.) Writing intensive. 4 cr.

726. Metamorphic Petrology
The metamorphism of pelitic, mafic, and calc silicate rocks as determined from field, petrographic, chemical, and experimental, and theoretical studies. Closed- and open-system reactions, multisystems, reaction space. Calculation of pressure-temperature time paths. Prereq: mineralogy; petrography; adequate background in calculus, chemistry, and physics. Field trips. Special fee. Lab. (Offered in alternate years with ESCI 725.) Writing intensive. 4 cr.

732. Regional Geology and Advanced Structure
Readings, discussion, and field/lab exercises in the theoretical and analytical analysis of mountain systems. Emphasis on the northern Appalachian Orogen. Application of modern structural analysis. Field excursion. Prereq: ESCI 631 or permission. Special fee. 4 cr.

734. Applied Geophysics
Gravity, magnetic, seismic, and electrical methods of investigating subsurface geology. Fieldwork and use of computers in data analysis. Prereq: ESCI 401; one year of calculus; one year of college physics/or permission. Special fee. Lab. Writing intensive. 4 cr.

741. Geochemistry
Thermodynamics applied to geological processes; geochemical differentiation of the earth; the principles and processes that control the distribution and migration of elements in geological environments; stable and radiogenic isotopes in geologic processes. Prereq: ESCI 512 or permission. Writing intensive. 4 cr.

745. Isotope Geochemistry
Elementary introduction to stable and radioactive isotopes. Emphasis on applications to geologic problems. Prereq: ESCI 741 or permission. 4 cr.

#703. Fluoride Hydrology
746. Analytical Geochemistry
Theory, instrumentation, and applications of analytical methods in geochemistry. Prereq: one year of chemistry or geochemistry/or permission. Special fee. Lab. 4 cr.

747. Aquifer Geochemistry
Processes that determine the geochemical characteristics of water bodies. Emphasis on the geo-chemical continuum of terrestrial water and its geochemical evolution. Topics include the influence of cyclic salts, the nature of weathering reactions, the CO₂ -CaCO₃ system, the formation and dissolution of salts and authigenic mineral formulation. Prereq: one year of chemistry or geochemistry/or permission. Lab. 4 cr.

750. Biological Oceanography
Biological processes of the oceans, including primary and secondary production, trophodynamics, plankton diversity, zooplankton ecology, ecosystems and global ocean dynamics. Field trips on R/V Gulf Challenger and to the Jackson Estuarine Laboratory. Prereq: one year of biology or permission of the instructor. (Also offered as ZOOL 750.) Special fee. Lab. (Not offered every year.) 4 cr.

752. Chemical Oceanography
Water structure, chemical composition and equilibrium models, gas exchange, biological effects on chemistry, trace metals, and analytical methods. Prereq: permission. Special fee. 1 credit lab (see ESCI 752L). 3 cr.

752L. Chemical Oceanography Lab
Optional lab for ESCI 752. Includes short cruise aboard R/V Gulf Challenger. Coreq: ESCI 752. Special fee. 1 cr.

754. Sedimentology
This course focuses on modern sedimentary processes and ancient sedimentary records through the examination, identification, and interpretation of sediments and sedimentary rocks. Topics such as sediment transport mechanisms, depositional environments, and time in sedimentary records will provide a strong framework for any student studying Earth processes and sedimentary systems. Prereq: ESCI 401 or 402 or 501, and 512; or permission. Special fee. Lab and field trips. 4 cr.

758. Introductory Physical Oceanography
Descriptive treatment of atmosphere-ocean interaction; general wind-driven and thermo-haline ocean circulation; waves and tides; continental shelf and nearshore processes; instrumentation and methods used in ocean research. Simplified conceptual models demonstrate the important principles. Prereq: college physics; ESCI 501/or permission 3 cr.

759. Geological Oceanography
Major geological features and processes of the ocean floor; geological and geophysical methods; plate tectonics. Prereq: two semesters each of calculus, physics, and geography/or permission. Lab. Writing intensive. 4 cr.

762. Glacial Geology
Survey of glacial processes and glacier dynamics with emphasis on understanding the physics of glaciers, glacial geologic processes, and interpretation of glacial deposits and landscapes. The course includes discussion of the role of glaciers and ice sheets in the Earth’s climate system, analysis of cyclic salts, the nature of weathering reactions, the CO₂ -CaCO₃ system, the formation and dissolution of salts and authigenic mineral formulation. Prereq: one year of chemistry or geochemistry/or permission. Special fee. Lab. Writing intensive. 4 cr.

764. Data Analysis in Earth System Science
An overview of paleoclimatic indicators for the last one million years in the context of global teleconnections (atmosphere-lithosphere-hydrosphere-cryosphere) and mathematical tools developed to interpret and link the different records of climate change. Prereq: one year calculus, one year chemistry, basic statistics/or permission. 4 cr.

765. Paleoecology
Review of past changes in Earth’s climate system with emphasis on the nature and causes of climate variability during the Quaternary Period (the last 1.8 million years, a time interval dominated by cycles of global glaciation). Includes evidence for climate change, techniques used to reconstruct paleoclimate records, and proposed mechanisms of global climate change. Course incorporates discussion of recent scientific papers from the primary literature. Writing intensive. 3 cr.

766. Volcanology
Reviews the present state of knowledge about volcanoes. Lecture topics include the generation and properties of magma, tectonic setting of volcanism, eruption styles, volcanic landforms and products, monitoring of active volcanoes, volcanic hazards and mitigation, and volcanism on other planets. Labs involve hand-sample observation, topographic map interpretation, analysis of geophysical-volcanological data, and two short field trips. Lectures and labs are supplemented by slides and videos. Because volcanology is a rapidly developing field of active research, the course will incorporate discussions of emerging scientific papers from the primary literature. Class participation will involve student-led summaries of the Weekly Volcanic Activity Report from the Global Volcanism Program/U.S. Geological Survey. Prereq: one year of calculus and one ESCI course or permission. Special fee. 4 cr.

770. Fundamentals of Ocean Mapping
Introduces the principles and practice of hydrography and ocean mapping. Methods for the measurement and definition of the configuration of the bottoms and adjacent land areas of oceans, lakes, rivers, estuaries, harbors and other water areas, and the tides or water levels and currents that occur in those bodies of water. Prereq: PHYS 407-408. (Also listed as OE 770.) Lab. 4 cr.

771. Geodesy and Positioning for Ocean Mapping
The science and technology of acquiring, managing, and displaying geographically-referenced information; the size and shape of the earth, datums and projections; determination of precise positionings of points on the earth and the sea, including classical terrestrial-based methods and satellite-based methods; shoreline mapping, nautical charting and electronic charts. Prereq: MATH 426, PHYS 408. (Also listed as OE 771.) 3 cr.

795, 796. Topics
Geologic, hydrologic, and oceanographic problems and independent studies by means of conferences, assigned readings, and field or laboratory work fitted by ESCI faculty to individual student needs; or new or specialized courses. Topics include geochemistry; geomorphology; geophysics; glaciology; groundwater; structural and regional geology; crystallography; mineralogy; petrology; their indurminics; ore deposits; earth resource policy; paleontology; sedimentation; stratigraphy; water resources management; chemical, physical, and geological oceanography; earth systems. Also, senior synthesis and earth science teaching methods. 1 to 4 cr.

797. Colloquium
Presentation of recent research in the earth sciences by guest speakers and department faculty. May be taken four times. Cr/F.

799. Senior Thesis
Students work under the direction of a faculty sponsor to plan and carry out independent research resulting in an oral presentation and a written thesis. Two-semester sequence; IA (continuous course) grade given at end of first semester. May be repeated to a maximum of 4 credits. Cr/F. 1 to 4 cr.

Economics (ECON)
(For program description, see page 105.)

401/401H. Principles of Economics (Macro)
Basic functions of the United States economy viewed as a whole; policies designed to affect its performance. Economic scarcity, supply and demand, the causes of unemployment and inflation, the nature of money and monetary policy, the impact of government taxation and spending, the federal debt, and international money matters. No credit for students who have had ECON 411. 4 cr.

402/402H. Principles of Economics (Micro)
Functions of the component units of the economy and their interrelations. Units of analysis are the individual consumer, the firm, and the industry. Theory of consumer demand and elasticity, supply and costs of production, theory of the firm under conditions of perfect and imperfect competition, demand for and allocation of economic resources, general equilibrium, and basic principles and institutions of international trade. Not open to students who have had EREC 411. No credit for students who have had ECON 412. 4 cr.

515. Economic History of the United States
U.S. economy from colonial times to the present. Models of economic development applied to the U.S. How social, political, technological, and cultural factors shape economy; development and influence of economic institutions. Prereq: ECON 401 or 402/or permission. 4 cr.

605/605W. Intermediate Microeconomic Analysis
Analysis of supply and demand. Determination of prices, production, and the distribution of income in noncompetitive situations and in the purely competitive model. General equilibrium. Prereq: ECON 402. 4 cr. 605W is writing intensive.

607. Ecological Economics
Analysis of efficiency, equity, and growth issues in the economy and their links to environmental quality and natural resources availability. Case studies of global warming, world hunger, etc. Prereq: ECON 401 and 402. Writing intensive. 4 cr.

611. Intermediate Macroeconomic Analysis
Macroeconomic measurement, theory, and public policy determination. Prereq: ECON 401 and 402. 4 cr.

615. History of Economic Thought
Examination and critical appraisal of the work of major economists, including the work of contemporary economists, and major schools of economists, particularly with reference to the applicability of their theories to current economic problems. Prereq: ECON 401 and 402. Writing intensive. 4 cr.
635. Money and Banking
Study of interest rates, financial markets, financial institutions, monetary institutions, the supply of money, the demand for money, monetary theory, and monetary policy. Prereq: ECON 401 and 402. 4 cr.

641. Public Economics
Alternative prescriptions and explanations concerning the role of government in contemporary market economies. General principles of public expenditure analysis. Selected case studies of public spending programs, e.g., welfare, defense, education. Analysis of various federal, state, and local taxes. Prereq: ECON 401; 605/or permission. 4 cr.

642. Health Economics
Theoretical and empirical analysis of the U.S. healthcare delivery sector. Topics include health insurance markets and their effects on patient demand, uninsured populations and their access to health care services, breakdowns in the principal/agent relationship between patient and providers, competition in the medical sector, technology, pharmaceuticals and the scope and effect of government involvement in the delivery of healthcare. Prereq: ECON 402. (Also listed as HMP 642.) 4 cr.

645. International Economics
Covers both international trade policy and open-economy macroeconomics. Some of the major issues include whether free trade is always preferred to restricted trade, the controversy over international policy and how best to structure the international financial system. Students gain an understanding of topics including currency exchange rate movements, macroeconomic adjustment mechanisms and trade policy, among others. Prereq: ECON 401 and 402. 4 cr.

651. Governmental Regulation of Business
Mergers, competition, monopoly, and the regulated industries. Prereq: ECON 402. 4 cr.

653. Law and Economics
Introduces the field of Law and Economics. Focuses on the legal system and the economic consequences of property, contract, tort, criminal law and mediation. Prereq: ECON 402. Writing intensive. 4 cr.

656. Labor Economics
Functioning of labor markets from theoretical and policy perspectives. Labor demand and supply, wages and employment. Welfare programs, human capital, discrimination in the labor market, unions, wage differentials. Prereq: ECON 401; ECON 402; ECON 605 recommended. 4 cr.

658. Organizational Economics and Architecture
Focuses on issues surrounding the need for coordination in an economy based on the division of labor. The role and function of the market, firm, and other coordinating mechanisms such as the Internet are analyzed in order to understand the role they play in facilitating economic activity. Prereq: ECON 402. Writing intensive. 4 cr.

668. Economic Development
Theories of development/underdevelopment. Trade, growth, and self-reliance. The role of agriculture (land tenure, food crisis, Green Revolution). World Bank policy, industrialization strategies. Role of the state. Prereq: ECON 401; ECON 402/or permission. Writing intensive. 4 cr.

669. Women and Economic Development
Examines the position, roles, and contributions of women in economic development as interpreted through different discourses (feminisms, modernity, post-modernity) and in theoretical conceptualizations (neoclassical integrationist, liberal feminism, class and gender, feminist ecology). Applied analyses on Africa, South Asia and Latin America. Prereq: permission. Writing intensive. 4 cr.

680. Economics of Electronic Commerce
Introduces the new opportunities and challenges posed by the transformation of the Internet into an electronic marketplace. Focus on electronic commerce: the creation and exchange of value between economic agents in an open digital marketplace. 4 cr.

685, 686. Study Abroad
Open to students studying abroad in the discipline as approved by the economics program director. Cr/F. 1 to 16 cr.

695/695W. Independent Study
Individual research projects that are student designed. Initial sponsorship of an economics faculty member must be obtained, and approval of WSBE adviser and dean. For juniors and seniors in high standing. Up to 4 credits may be used as a major elective. 2 to 12 cr. 695W is writing intensive.

696. Supervised Student Teaching Experience
Participants are expected to perform such functions as leading discussion groups, assisting faculty in undergraduate courses that they have successfully completed, or working as peer advisers in the advising center. Enrollment is limited to juniors and seniors who have above-average G.P.A.s. Reflective final paper is required. Prereq: permission of instructor, department chair, and director of undergraduate programs. No more than 4 credits may be earned as a teaching assistant in any one course. May be repeated to a maximum of 8 credits. Cr/F. 1 to 8 cr.

698. Topics
Special topics. May be repeated. Prereq: permission. Writing intensive. 4 cr.

707. Economic Growth and Environmental Quality
Analysis of the interrelationships among economic growth, technological change, population increase, natural resource use, and environmental quality. Application of alternative theoretical approaches drawn from the social and natural sciences. Focus on specific environmental problems, e.g., affluence and waste disposal problems, and loss of biodiversity. Prereq: ECON 605; 611/or permission. 4 cr.

725. Mathematical Economics
Principal mathematical techniques and their application in economics. Topics covered: matrix algebra, derivatives, unconstrained and constrained optimization, linear and nonlinear programming, game theory, elements of integral calculus. Prereq: permission. 4 cr.

726. Introduction to Econometrics
Introduces regression techniques as used in economics and management; estimation and statistical inference in the context of the general linear model; discussion of problems encountered and their solutions; extensions of the general linear model. Prereq: DS 420 or equivalent. 4 cr.

736. Seminar in Monetary Theory and Policy
Contemporary developments in monetary theory and the evaluation of policy measures. Prereq: ECON 635. Writing intensive. 4 cr.

741. Introduction to Public Policy
Explores the basic issues of public sector economics and emphasizes the use of economic theory in predicting the effects of public policy on individual behavior and the overall economy. Specific topics include market failures, collective decision making, cost/benefit analysis, and an evaluation of tax and transfer programs. Writing intensive. 4 cr.

746. International Finance
International monetary mechanism; balance of payments, international investment, exchange rates, adjustment systems, international liquidity, foreign aid, multinational corporations. Prereq: ECON 611; ECON 645. Writing intensive. 4 cr.

747. Multinational Enterprises
Internationalization of economies. Growth and implications of multinational corporations at the level of the firm. Theories of imperialism, international unity/rivalry; theories of direct investment, exercise of influence and conflict, technology transfer, bargaining with host country; effects on U.S. economy. Prereq: permission. 4 cr.

756. Labor Economics
Recent developments in labor market analysis and public policies related to contemporary labor issues. Labor supply, the structure and stratification of labor markets, economic discrimination, unemployment and poverty, inflation, and wage-price controls. Prereq: ECON 656. 4 cr.

768. Seminar in Economic Development
Advanced reading seminar. Topics include methodologies underlying economic development theory, industrialization and post-import substitution, state capitalist development, stabilization policies, appropriate technologies, the capital goods sector, agricultural modernization schemes, and attempts at transition to socialism. Prereq: permission. 4 cr.

775. Applied Research Skills for Economists
Capstone course for students enrolled in B.S. in economics. Uses analytical and problem-solving skills plus data-analysis and computer skills from earlier classes to study and analyze the U.S. economy, sector by sector. Topics will include time-series and simultaneous-equations models. Research paper combines theory and data-analysis skills. Prereq: ECON 605, 611, 726; MATH 424A or equivalent. Writing intensive. 4 cr.

795. Internship
On-the-job skill development through fieldwork in an organization (business, industry, health, public service, etc.). Normally, supervision is provided by a qualified individual in the organization, with frequent consultation by a faculty sponsor. Written report required. Internships may be part or full time, with course credits assigned accordingly. May not be used as a major elective. Cr/F. 1 to 16 cr.

798. Economic Problems
Special topics; may be repeated. Prereq: permission of adviser and instructor. Writing intensive. 2 or 4 cr.

799. Honors Thesis
Supervised research leading to the completion of an honors thesis; required for graduation from the honors program in economics. Prereq: permission of director of undergraduate programs and department chair. Writing intensive. 4 to 8 cr.
440. Concepts of Career Exploration

The central issue in this seminar is the nature of EDUCATION improvement, 3) relating present and future classes to entering the world of work, and 4) developing flexibility for changes that may occur in the future. Special fee. 4 cr.

444. Learning to Learn

The central issue in this seminar is the nature of learning. What does it mean to learn? To be a learner? What role does learning play in students' own lives? Both in and out of school? Students consider the roles of the environment, the teacher, and the learner in thinking about what it means to learn. Through readings, discussions, classroom activities, investigations and observations students develop their own beliefs and understandings about what it means to learn. Students in the course explore specific topics related to learning, including the nature of intelligence and motivation, and the roles of attention, memory and context in learning. They consider both formal and informal learning environments as well as structures that support or impede learning. Students work together in groups to solve problems and present information to others. They use reflection as a tool for learning and increase their understanding of themselves as learners. Writing intensive. 4 cr.

444A. Reflective Learning: Creativity, Motivation and Learning Style

Course addresses the roles of the environment, the teacher, and the learner in thinking about what it means to learn. Specific topics related to learning, including the nature of creativity, intelligence and motivation, and the roles of attention, memory, culture and context in learning are covered. Students work reflectively as well as together in groups to solve problems, present information to each other, and address each other's questions. Writing intensive. 4 cr.

500. Exploring Teaching

For students considering a teaching career. In-school experiences to develop introductory skills in teaching. On-site seminars for analysis and evaluation. Assessment and advising related to teaching as a career. Prerequisite for further work toward teacher licensure. Minimum of 7 hours a week, plus travel time, required. Prerq. permission. Cr/Er. 4 cr.

506. Service Learning Experiences in Literacy

Supports students engaged in school-based literacy tutoring as service learning experiences. Explores tutoring methods in literacy, community/school service, and contemporary issues in education. May be repeated to six credits, one credit per semester. Prerq: permission required. Cr/F. 1 cr.

507. Mentoring Adolescents

This seminar is intended for undergraduate men and women who are mentoring local middle-school students in their community. The mentoring involves minimally tutoring the mentees once a week at their schools. The seminar meets twice a month for two hours. Additionally, one tutoring session a month is reserved for a focus group discussion involving the mentors and their mentees at the school site. 2 cr.

630. Development of Food and Fiber in Third World Countries

The world food situation and the role of agriculture and education in development of third-world agrarian systems. Identifies constraints on food production, technology transfer, advantages and disadvantages of different agriculture systems, agricultural marketing, and career opportunities in international agriculture. 4 cr.

694. Courses in Supervised Teaching


694D. Courses in Supervised Teaching

Supervised teaching of Kinesiology. Cr/F. 4 cr.

700. Educational Structure and Change

Organization, structure, and function of American schools; historical, political, social and cross-cultural perspectives; nature and processes of change in education. A) Educational Structure and Change; B) Education in America: Backgrounds, Structure, and Development of School System in America; C) School and Cultural Change; E) Teacher and Cultural Change; F) Social Perspectives of Conflict in the Schools; G) Nature and Processes of Change in Education; H) What is an Elementary School?; I) Schooling for the Early Adolescent; J) Curriculum Structure and Change; K) Stress and Educational Organization; L) Candidates teacher licensure must take either 4-credit course 700A, or 2 credits each of 700F and 700C. Prerq: for teacher licensure: EDUC 500 and junior status. Prerq: for students not seeking teacher licensure: instructor permission. Writing intensive. 2 or 4 cr.

701. Human Development and Learning: Educational Psychology

Child development through adolescence, learning theory, cognitive psychology, research in teaching and teacher effectiveness, cross-cultural variability, and evaluation—all applied to problems of classroom and individual teaching and learning. A) Human Development and Learning: Educational Psychology; B) Human Development: Educational Psychology; C) Human Learning: Educational Psychology; D) Developmental Psychology: Learning Theory, Modification of Behavior, and Classroom Management; E) Cognitive and Moral Development; F) Evaluating Classroom Learning; G) Deliberate Psychological Education; H) Sex Role Learning and School Achievement; J) The Development of Thinking. Each semester 2-credit and 4-credit courses are offered. 2-credit courses emphasize either development or learning. Candidates for teacher licensure are required to have the 4-credit course (701A) or 2 credits each of 701B and 701C. Prerequisite for teacher licensure: EDUC 500 and junior status. Prerequisite for students not seeking teacher licensure: instructor permission and junior status. 701A has a special fee when taught in Manchester. Writing intensive. 2 or 4 cr.

703. Alternative Teaching Models

Basic teaching models, techniques of implementation, and relationships to curricula. A) Alternative Teaching Models; B) Curriculum Planning for Teachers; C) Alternative Strategies for Maintaining Classroom Control; D) Social Studies Methods for Middle and High School Teachers; F) Teaching Elementary School Science; G) Language Arts for Elementary Teachers; H) Experimental Curriculum; I) Children with Special Needs; Teaching Strategies for the Classroom Teacher; K) Writing across the Curriculum; L) Learning and LOGO; M) Teaching Elementary School Social Studies. 2-credit and 4-credit courses are offered. Teacher education students should be aware of the specific course(s) required for their licensure area. EDUC 703F and M are required for elementary education candidates. EDUC 703D is required for social studies candidates. EDUC 791 is required for science candidates. For all other secondary education candidates, the appropriate methods course in the department of major is required. See the Schoolhouse Book for specific course listings. Prerequisite for teacher licensure: EDUC 500 and junior status. Prerequisite for students not seeking teacher licensure: instructor permission and junior status. 703F has a special fee when taught in Manchester. 2 or 4 cr.

705. Alternative Perspectives on the Nature of Education

Students formulate, develop, and evaluate their own educational principles, standards, and priorities. Alternative philosophies of education; contemporary issues. A) Contemporary Educational Perspectives; B) Controversial and Ethical Issues in Education; C) Organization and Structure of the Curriculum; D) Curricular Change; E) Curriculum Theory and Development; F) Readings on Educational Perspectives; G) Philosophy of Education; I) Education as a Form of Social Control; K) Schooling and the Rights of Children; L) Education, Inequality, and the Meritocracy; M) Readings and Philosophies of Outdoor Education; N) Alternative Perspectives on the Nature of Education; O) Classrooms: The Social Context; P) Teaching: The Social Context; Q) School and Society. 2-credit and 4-credit courses are offered. Candidates for teacher licensure must choose either 4-credit course 705A, 705B, or 705Q. Prerequisite for teacher licensure: EDUC 500 and junior status. Prerequisite for students not seeking teacher licensure: instructor permission and junior status. Writing intensive. 2 or 4 cr.

706. Introduction to Reading in the Elementary School

Methods in reading and writing instruction; current procedures and materials; diagnostic techniques. Course satisfies reading/language arts requirement for prospective elementary teachers in the five-year teacher education program. Prereq: EDUC 500 and junior status. 4 cr.

707. Teaching Reading through the Content Areas

Approaches and methods for teaching reading through content materials; coursework includes practical applications through development of instructional strategies and materials. Required for candidates seeking certification in art, biology, chemistry, earth science, general science, physical science, physics, or social science. 2 cr.

710A. Concepts of Adult and Occupational Education

Development of occupational education in the U.S.; socio-economic influences responsible for its establishment; federal and state requirements for secondary and postsecondary schools. Coordination of programs with general education and vocational fields. Focus on selected concepts of adult education. Preparation for the adult as a learner, volunteer management, evaluation and accountability, experiential learning, and adult education. Required of all degree candidates in AOE concentrations. Writing intensive. 4 cr.
710B. Microcommunications
Organization, presentation, and evaluation of micro-lessons in a variety of educational settings. Preliminary experience and practice in communications. Variables of communicating under controlled conditions with videotaping for immediate feedback. Required for majors and minors. Special fee. Writing intensive. 4 cr.

710C. Youth Organizations
Organizational development (advising youth organizations, teaching parliamentary procedure, developing programs and activities, leadership). FFA/SAEP (Future Farmers of America/Supervised Agricultural Experience Programs, for high school youth). VICA (Vocational Industrial Clubs of America). 4-H (Cooperative Extension Youth Program). 4 cr.

710E. Workshop in Adult and Occupational Education
Modularized instruction of in-service education. Focus varies with the needs of the student. May be repeated for up to 8 credits. 1 to 4 cr.

710F. Investigations
Topics may include career education, secondary education, post-secondary education, adult education, extension education, exemplary education, cooperative education, disadvantaged and handicapped education, international agriculture, or teaching experience. Student-selected in one of the areas listed. Elective after consultation with instructor. Hours arranged. May be repeated. 1 to 4 cr.

717. Growing up Male in America
An integrative view of growing up male in the American culture from birth through adulthood. Analysis of major perspectives on male development and the implications in parenting with specific emphasis on male education. Participants are expected to develop awareness of their own development as a male or alongside males, using current male development perspectives as a guide. They also create an awareness of how this will affect their behavior toward boys in their classrooms. 4 cr.

720. Introduction to Computer Applications for Education
Major issues related to classroom computer applications: historical development; computer functions; methods of instruction; problem solving; educational software development and evaluation; psychological and sociological impact of the computer on children and learning. A practical approach is stressed. Lab. 4 cr.

733. Introduction to the Teaching of Writing
Development of writers, child to adult; ways to respond to writing; organization of the classroom for the teaching of writing. Persons taking the course need to have access to students to carry out course requirements. Prereq: permission. 4 cr.

734. Children's Literature
Interpretive and critical study of literature for children in preschool and elementary settings. Methods of using literature with children. 4 cr.

735. Young Adult Literature
Critical study of the fiction and nonfiction genres that constitute literature written for the adolescent reader. Emphasis on literary analysis of young adult literature and its pedagogical uses in middle/junior high/high school curriculum. 4 cr.

741. Exploring Mathematics with Young Children
A laboratory course offering those who teach young children mathematics, and who are interested in children's discovery learning and creative thinking, an opportunity to experience exploratory activities with concrete materials. Offers mathematical investigations through which one may develop the ability to provide children with a mathematically rich environment to become adept at asking problem-solving questions. 4 cr.

750. Introduction to Exceptionality
A life span perspective of the social, psychological, and physical characteristics of individuals with exceptionalities including intellectual, sensory, motor, health, and communication impairments. Includes implications for educational and human service delivery. 4 cr.

751A. Educating Exceptional Learners: Elementary
Foundations of special education and an introduction to a variety of service delivery models with an emphasis on educating all learners in heterogeneous classrooms. Instructional strategies and supports for all students, particularly those with mild and moderate disabilities, will be the primary focus. 4 cr.

751B. Educating Exceptional Learners: Secondary
Foundations of special education and an introduction to a variety of service delivery models with an emphasis on educating all learners in heterogeneous classrooms. Instructional strategies and supports for all students, particularly those with mild and moderate disabilities, is the primary focus. Preparation for students' transitions to post-secondary life is included. 4 cr.

751C. Educating Exceptional Learners: Related Services
An overview of special education and related services in an educational setting. Focus on support services provided to general education and special education teachers, including laws relating to special populations, how related services interact with classroom and special educators, IEPs, and other topics that impact services provided to students with special needs. 4 cr.

752. Contemporary Issues in Learning Disabilities
Critical analysis of current and historical conceptions of learning disability in the areas of definition, supporting theories, assessment practice, and teaching methodologies. Focus on contemporary issues in the field that relate to working with students labeled as learning disabled at both elementary and secondary levels. 4 cr.

753. Contemporary Issues in Behavioral Disabilities
Nature and scope of emotional and behavioral disabilities in students for elementary through secondary levels. Theoretical perspectives, characteristics, assessment and educational intervention strategies are included. 4 cr.

754. Contemporary Issues in Developmental Disabilities
The causal factors, physical and psychological characteristics, and educational and therapeutic implications of mental retardation, cerebral palsy, epilepsy, autism, and related conditions. A life span perspective is included, with major emphasis on the school-age population. 4 cr.

755. Fostering Social Relationships for Students who Experience Significant Disabilities
Focuses on the supports students with significant disabilities need in order to have a wide variety of satisfying social relationships. Students learn to identify and facilitate the factors essential to the development of friendships such as full inclusion; valued membership and belonging; shared experiences; an effective means of communication understood by everyone; and access to typical school, extracurricular, and community environments and activities. Additionally, students learn to identify and mitigate the barriers to friendships, such as low expectations; devaluing of differences; age-appropriate experiences; and educational practices, such as pull-out and separate special education programs. Students learn about appropriate relationship supports, especially relating to the facilitation of communicative interactions. 2 cr.

760. Introduction to Young Children with Special Needs
Needs of children (birth to eight years) with developmental delays or who are at risk for disabilities. Strengths and special needs of such children; causes, identification, and treatment; current legislation; parent and family concerns; program models. 4 cr.

767. Students, Teachers, and the Law
Our public schools play a vital role in our society. What shall be taught and who shall teach our children are perennial questions. This course explores how the laws impact the educational lives of students and teachers, including issues of church-state relations, free speech, dress codes, and search and seizure. (Also offered as JUST 767.) 4 cr.

776. Reading for Learners with Special Needs
Techniques and procedures for teaching reading to learners with special needs. Emphasis on providing reading instruction in the least restrictive alternative. 4 cr.

780. Belize/New Hampshire Teacher Program
International course involving teams of teachers from Belize and New England. The program offers teachers in both countries the opportunity to work collaboratively on developing effective teaching practices, develop an understanding of each other's cultural and educational perspectives, extend the experience to other teachers and students upon return. Special fee. 4 cr.

781. Introduction to Statistics: Inquiry, Analysis, and Decision Making
An applied statistics course that covers introductory-level approaches to examining quantitative information. Students spend about half of class time in the computer lab analyzing real data from the behavioral and social sciences. An emphasis is placed on the role of statistics in making empirically-based policy decisions. 4 cr.

785. Educational Assessment
Theory and practice of educational evaluation; uses of test results in classroom teaching and student counseling; introductory statistical techniques. 4 cr.
791. Methods of Teaching Secondary Science
Application of theory and research findings in science education to classroom teaching with emphasis on inquiry learning, developmental levels of children, societal issues, integration of technology, critical evaluation of texts and materials for science teaching, and planning for instruction. Lab. 4 cr.

795, 796. Independent Study
Juniors and seniors only, with approval by appropriate faculty member. Neither course may be repeated. 2 or 4 cr.

797. Seminar in Contemporary Educational Problems
Issues and problems of special contemporary significance, usually on a subject of recent special study by faculty member(s). Prereq: permission. May be repeated for different topics. Special fee on topic: Picturing Writing, Fostering Literacy through Art. 1 to 4 cr.

Electrical & Computer Engineering (ECE)

(For program description, see page 62.)

401. Perspectives in Electrical and Computer Engineering
An introductory course for electrical and computer engineering majors that introduces incoming students to the fundamental concepts of analysis and design. Concepts are presented through an examination of real-world problems. Students are exposed to electrical and computer engineering problem solving and design through active learning techniques in lecture and in a laboratory setting. Provides a context for the electrical engineering and computer engineering curriculum and introduces the profession and activities of electrical and computer engineering. Two lectures and one computer laboratory per week are required. No prerequisites. Lab. 4 cr.

537. Introduction to Electrical Engineering
Fundamentals of electrical engineering. Topics are circuit elements; signal waveforms; circuit laws and theorems; transfer functions; free, forced, and steady state responses; power calculations; amplifiers; and magnetic circuits. Non-ECE majors only. Lab. Prereq: PHYS 408. Pre- or Coreq: MATH 527. 4 cr.

541. Electric Circuits
Linear passive circuits beginning with resistive circuits, power and energy relations, mesh and nodal analysis. Transient and steady-state behavior of simple circuits containing energy storage elements (capacitors, inductors). Introduction to linear active circuits using dependent source models and ideal op amps. Introduction to transfer function and frequency response concepts. For ECE majors only. Prereq: MATH 426; Pre or Coreq: PHYS 408. Lab. 4 cr.

543. Introduction to Digital Systems
Fundamental analysis and design principles. Number systems, codes, Boolean algebra, and combinational and sequential digital circuits. Lab: student-built systems using modern integrated circuit technology and an introductory design session on a CAD workstation. Lab and discussion. 4 cr.

544. Engineering Analysis
Analyze and solve engineering problems using linear algebra and integral and differential calculus of functions of several variables. Boundary-value problems in mechanics, fluid dynamics, and electrostatics. Examination of electrostatics, magnetostatics, and fluid and wave mechanics using vector differential and integral calculus. Introduction of approximation and error analysis methods as fundamental engineering tools. Prereq: MATH 527. 4 cr.

548. Electronic Design I
Introduction to electronic design for analog signal processing. Linear op amp circuits for amplification and filtering. Use of Laplace techniques for filter specification; simple passive and op amp filter realizations. Discrete active devices (FET and BJTs): operating characteristics, biasing considerations, canonical amplifier configurations including differential amplifiers. Prereq: ECE 541. Lab. 4 cr.

562. Computer Organization
Basic computer structure, including arithmetic, memory, control, and input/output units; the trade-offs between hardware, instruction sets, speed, and cost. Laboratory experiments involving machine language programming and I/O interfacing using microcomputers. Prereq: CS 410 or CS 415; ECE 543; or permission. Lab. 4 cr.

583. Designing with Programmable Logic
Design methodologies for implementing digital systems in programmable logic. Covers topics related to the design, implementation, and testing of programmable logic devices. Students are introduced to the Very-High-Speed Hardware Description Language (VHDL) entry language and simulation procedures, along with common logic synthesis tools. Programmable logic families, device architectures, and testing procedures are covered in detail. Laboratory exercises lead the student through the complete programmable logic design cycle. Each student is required to prototype a digital system starting with VHDL entry, functional and timing simulations, logic synthesis, device programming, logic probing, and systems verification. Prereq: ECE 543, ECE 562 or permission. Lab. 4 cr.

603/603H. Electromagnetic Fields and Waves I
Maxwell's equations in integral and differential form with applications to static and dynamic fields. Uniform plane waves in free space and material media. Boundary conditions; simple transmission line theory; parallel plate and rectangular waveguides; simple radiating systems. Honors students will attend an additional one-hour meeting each week. Prereq: PHYS 408; ECE 544 or equivalent. 4 cr.

617. Junior Laboratory I
Application of laboratory instrumentation to the investigation of active and passive circuit characteristics; introduction to computer-aided design, analysis, and testing; development of report writing and oral presentation skills. Coreq: ECE 633, ECE 651. Writing intensive. 4 cr.

618. Junior Laboratory II
Laboratory exercises in the design and analysis of active circuits, techniques of signal processing, and the properties of distributed circuits. Continued development of report writing and oral presentation skills. Prereq: ECE 603, 617. Writing intensive. 4 cr.

633/633H. Signals and Systems I
Mathematical characterization of continuous-time systems using time- and frequency-domain concepts. Properties of linear systems described by ordinary differential equations. Fourier analysis of signals and system frequency response functions. Applications to communication and control systems. Introduction to system simulation using computer methods. Honors students attend an additional one-hour meeting each week. Prereq: MATH 527 or equivalent. 3 cr.

634. Signals and Systems II
Transient response analysis of linear systems using Laplace transforms, application to feedback control systems. Introduction to discrete-time linear systems; system response determination using Z-transform; elementary design of digital filters and controllers. State variable formulation of dynamical systems. Prereq: ECE 633 or permission. 3 cr.

641. Embedded Microcomputer Based Design
An in-depth treatment of the design of embedded microcomputer systems. Topics include advanced architectures for embedded processors, hardware and software aspects of interfacing, handling interrupts, advanced programming including debugging of real-time systems, embedded application implementations. Laboratory studies are required to reinforce theoretical and applied concepts in an actual embedded architecture. Prereq: ECE 562 or permission. Lab. 4 cr.

651. Electronic Design II
Design of fundamental circuit blocks in electronic systems. Multistage amplifiers; feedback systems and stability; power amplifiers. Nonlinear electronic circuits: oscillators, function generators; clippers and peak detectors; A/D and D/A conversion. Switching mode and logic circuits. Prereq: ECE 548. 4 cr.

668/668H. Fundamentals of Computer Engineering
Software engineering principles and practices; computer-aided design and computer-aided engineering methodologies; sampled data systems; computer architecture comparisons and tradeoffs. Honors students engage in additional advanced project work. Prereq: ECE 562, PHYS 408 or permission. Electrical Engineering majors only. Lab. 4 cr.

681. Teaching Experience
Credit for assisting in the instruction of undergraduate laboratories. Available on a limited basis to students selected by the department chairperson. May be repeated for credit up to a total of 4 credits. 1 cr.

704. Electromagnetic Fields and Waves II
Loop antennas; aperture and cylindrical antennas; self and mutual impedance; receiving antennas and antenna arrays; bounded plane waves; rectangular and cylindrical waveguides; waveguide discontinuities and impedance matching; solid-state microwave sources. Prereq: ECE 603 or equivalent. 4 cr.
711. Digital Systems
Principles and procedures related to the design and implementation of microprocessor-based embedded systems. Topics include microprocessor technology; management of the development cycle; implementation methodologies such as printed circuit board systems and system integration; design considerations related to manufacturing and testing of digital systems; and analysis implementation limitations related to electromagnetic noise, grounding/power schemes, timing, device packaging, and heat/power requirements. Students prototype a digital system using CAD tools, printed circuit board technology; and modern diagnostic/testing procedures and tools. Devices such as microprocessors, microcontrollers, network controllers, data/acquisition/processing units, application specific integrated circuits, and interface logic will be selected for the design projects. Projects reflect the advances in modern digital technologies. Prereq: ECE 668; or permission. Lab. 4 cr.

714/714H. Introduction to Digital Signal Processing
Introduction to digital signal processing theory and practice, including coverage of discrete time signals and systems, frequency domain transforms and spectral analysis, digital filter terminology and design, and sampling and reconstruction of continuous time signals. Laboratory component provides an introduction to DSP design tools and real-time algorithm implementation. Honors students engage in additional advanced project work. Prereq: ECE 633; or permission. Lab. 4 cr.

715. Introduction to VLSI
Principles of VLSI (Very Large Scale Integration) systems at the physical level. CMOS circuit and logic design, CAD tools, CMOS system case studies. Students exercise the whole development cycle of a VLSI chip: design and layout performed during semester I. The chips are fabricated off campus and returned during semester II, when they are tested by students. An IA (continuing grading) grade is given at the end of semester I. Prereq: ECE 688 or permission. 4 cr.

717. Introduction to Digital Image Processing
Digital image representation; elements of digital processing systems; multidimensional sampling and quantization; image perception by humans, image transformations including the Fourier, the Walsh, and the Hough Transforms; image enhancement techniques including image smoothing, sharpening, histogram equalization, and pseudocolor processing; image restoration fundamentals; image compression techniques, image segmentation and use of descriptors for image representation and classification. Prereq: ECE 633; ECE 647 or permission. Lab. 4 cr.

734/734H. Network Data Communications
Introduces basic concepts related to data transmission equipment and physical interfaces, data communication protocols, and the Open System Interconnection (OSI) Reference Model. Includes physical layer hardware, signaling schemes, protocol packets, computer interfaces, error detection, signal integrity, and data transmission protocols relative to both wired and wireless networks. Introduces both logical and wide-area networks, and how a networking system is constructed, tested, and managed. Network design and testing exercises. Honors students engage in additional advanced project work. Prereq: ECE 633, 667 or 688, or permission. 4 cr.

745. Environmental Acoustics I: Air and Water
Sound and vibration; simple harmonic oscillators; characteristics and measurements of sound sources and receivers; acoustic wave equation (1D, 2D, 3D); sound reflection, transmission, refraction, and absorption in various media; room acoustics; basic sound equation. Prereq: PHYS 408; MATH 527; ECE 544 or permission. Lab. (Also listed as OE 745.) 4 cr.

757. Fundamentals of Communication Systems
Spectra of deterministic and random signals; baseband and bandpass digital and analog signaling techniques; transmitter and receiver architectures; performance analysis of digital and analog signaling in additive noise channels; carrier and symbol timing synchronization methods. Prereq: ECE 633; ECE 647 or permission. Lab. 4 cr.

758. Communication System Design
System- and circuit-level design and implementation of communication hardware including: mixers, RF amplifiers, filters, oscillators and frequency synthesizers, modulators and detectors, carrier and symbol timing recovery subsystems. Issues in software-defined radio transmitter and receiver implementation. Communication link engineering including antenna selection and channel impairment effects. Prereq: ECE 651; ECE 757; or permission. Lab. 4 cr.

760. Introduction to Fiber Optics
Basic physical and geometric optics; solution of Maxwell's equations for slab waveguides and cylindrical waveguides, of both step index and graded index profiles; modes of propagation and cutoff; polarization effects; ground and phase velocity; ray analysis; losses; fabrication; sources; detectors; couplers; splicing; and applications. System design. Prereq: ECE 603 or permission. Lab. 4 cr.

772. Control Systems
Development of advanced control system design concepts such as Nyquist analysis; lead-lag compensation; state feedback; parameter sensitivity; controllability; observability; introduction to nonlinear systems; and model discrimination. Includes interactive computer-aided design and real-time digital control. Prereq: ECE 634 or permission. (Also offered as ME 772.) Lab. 4 cr.

774. Introduction to Neural Networks
Introduces theory and application of artificial neural networks. Single layer and multilayer feedforward and recurrent network architectures. Supervised, unsupervised, and reinforcement learning principles. Applications to control and signal processing. ECE majors or permission. 4 cr.

775. Applications of Integrated Circuits
Design and construction of linear and nonlinear electronic circuits using existing integrated circuits. Limitations and use of operational amplifiers. Laboratory course in practical applications of nondigital integrated circuit devices. Prereq: ECE 651 or permission. Lab. 4 cr.

777. Collaborative Engineering
Study of processes in which engineers from diverse disciplines cooperate to specify, design, manufacture, and test products. Course includes a project. Classes are organized in both technical and nontechnical flexible modules. Technical topics are advanced and relevant to project being developed, such as related research, technology, design methodology, and CAD tools. Nontechnical topics include ISO 9000 quality system, engineering management, budget considerations, building, communication and leadership skills, and concurrent engineering principles. The course utilizes collaborative engineering by team development of an engineering project, often a research oriented proof-of-concept prototype. Prereq: permission. Lab. 4 cr.

781. Physical Instrumentation
Analysis and design of instrumentation systems. Sensors, circuits, and devices for measurement and control. Elements of probability and statistics as applied to instrument design and data analysis. Transmission, display, storage, and processing of information. The design, implementation, testing, and evaluation of a relevant instrument system is an integral part of the course. Prereq: ECE 651 or permission. Lab. 4 cr.

784. Biomedical Instrumentation
Principles of physiological and biological instrumentation design including transducers, signal conditioning, recording equipment, and patient safety. Laboratory includes the design and use of instrumentation for monitoring of electrocardiogram, electromyogram, electroencephalogram, pulse, and temperature. Current research topics, such as biotelemetry, ultrasonic diagnosis, and computer applications. Prereq: ECE 651 or permission. Lab. 4 cr.

785. Environmental Acoustics II: Air and Water
General sound equation: active, passive; sound generation, source level, directivity, calibration methods; sound propagation, rays and normal modes, acoustic waveguides; transmission loss, reverberation, scattering; ambient noise characteristics and measurements; sound reception and processing. Prereq: ECE 745/845 or OE 745/845. Lab. 4 cr.

791/791H. Senior Project I
Provides background for the capstone design experience. Topics include creativity, design methodology, specification development, total quality management, ethics, safety, reliability, aesthetics, and preparation for oral and written reports. Capstone project selection procedure. Honors students attend an additional meeting each week and engage in independent and advanced project work. Writing intensive. Cr/F. 2 cr.

792/792H. Senior Project II
Continuation of ECE 791. This course requires the completion of the capstone design experience. Honors students attend an additional meeting each week and engage in independent and advanced project work. Writing intensive. Cr/F. 2 cr.

795. Electrical Engineering Projects
Laboratory course. Students either join a department research project or engage in a project in an area of staff interest. Prereq: acceptance by staff member. 1 to 4 cr.

795H. Senior Honors Project
Independent analytical or laboratory study under the guidance of a faculty member. A written report is required. Prereq: senior ECE standing, 4 credits for one semester or 2 credits for each of two semesters with IA (continuous grading) given at the end of first semester. 2 or 4 cr.

796. Special Topics
New or specialized courses and/or independent study. Prereq: permission. 1 to 4 credits some sections may use credit/fail grading. 1 to 4 cr.
Engineering Technology (ET)

(For program description, see page 136.)

#645A. Instrumentation
4 cr.

English (ENGL)

(For program description, see page 34.)

400. English as a Second Language
Improves the competence of foreign students in listening comprehension, speaking, reading, and writing. Recommended as preparation for ENGL 401. May be repeated up to a total of 16 credits. Writing intensive. Cr/F. 1 to 16 cr.

401/401H. First-Year Writing
Training to write more skillfully and to read with more appreciation and discernment. Frequent individual conferences for every student. Special fee. Writing intensive. 4 cr.

401A. First-Year Writing for English as a Second Language Students
A special section of first-year writing for students whose native language is not English. Training to write more skillfully and to read with more appreciation and discernment, with special attention to the problems of non-native speakers of English. Supplemental work on listening and speaking as necessary. Frequent individual conferences for every student. Students may not take both ENGL 401 and ENGL 401A for credit. Special fee. Writing intensive. 4 cr.

403. Introduction to the Study of Literature
The art of thoughtfully enjoying various kinds of literature, the substance and language of literature and literary techniques. Writing intensive. 4 cr.

#404. Writing Studio
Regular intensive work in small instructional group on writing skills, including grammar and usage. Designed to be taken in conjunction with writing-intensive courses, including First-year Writing. (May be repeated once.) Cr/F. 1 cr.

405/405H. Introduction to Linguistics
Overview of the study of language: universal properties of human language, Chomsky's innateness of hypothesis, language acquisition in children, dialects and language variation, language change. Includes introduction to modern grammar (phonology, syntax, semantics) and to scientific linguistic methodology. (Also offered as LING 405.) 4 cr.

419/419H. Introduction to Literary Analysis
Critical analysis of fiction, poetry, and drama. Frequent short papers. This course is a prerequisite with a minimum grade of C for those intending to declare one of the four majors offered in the English Department. Writing intensive. 4 cr.

444B. Secret Lives of Words
Using problem and inquiry-based pedagogy, this class delves into the ways in which new words are coined, how they become established or die, and how they change over their natural lives. Touching upon topics in philosophy (the nature of meaning), theoretical linguistics (morphology, sociolinguistics), and lexicography, introduces students to both the methods of text-based analysis and field-based research. Topics include word formation; the history of vocabulary in English; the making of dictionaries; slang, jargon, and taboo language. Writing intensive. (Also listed as LING 444B.) 4 cr.

444C. College Writing
The history, philosophy, and current state of higher education in the United States. Students develop their own perspectives on the value of college. Writing intensive. 4 cr.

444D. Irish Identity
Explores the historical causes and literary effects of emigration from Ireland to other regions in the North and South Atlantic. Considers the political and economic conditions of Ireland itself and asks how Irish identities are first formed dialectically through contact with indigenous others and then nostalgically constituted through the experience of migration. Writing intensive. 4 cr.

444E. Lions and Tigers and Books
Course asks students to consider their personal experience of the relationship between humans and animals in the light of theoretical investigations from the fields of biology, psychology, philosophy, literature, and the arts. Students read fundamental cultural texts (Darwin, Freud, the Bible) and great literary works (Moby Dick, "The Metamorphosis"), in combination influential contemporary works (Peter Singer, Animal Liberation) and popular nonfiction works that offer a multidisciplinary view of human history and identity. Appropriate for students with ambitions in scientific fields who maintain a strong interest in the liberal arts. Writing intensive. 4 cr.

501/501H. Introduction to Creative Nonfiction
A writing course that explores types of creative nonfiction such as nature writing, the profile, the memoir, and the personal essay. Extensive reading of contemporary authors to study the sources and techniques used in creative nonfiction. Regular papers, conferences, and workshops. Special fee. Writing intensive. 4 cr.

502/502H. Technical Writing
A writing course focusing on effective communication of technical information. Writing of various technical documents, such as business letters, proposals, reports, brochures and web pages. Special emphasis on design, usability, visual rhetoric, and the use of technology in writing. Special fee. Writing intensive. 4 cr.

503. Persuasive Writing
Writing of all types of persuasive nonfiction prose, including argumentative essays and position papers. Special attention to argumentative structures and analysis of audiences. Weekly papers of varying lengths and formats, frequent conferences. Special fee. Writing intensive. 4 cr.

#511. Major Writers in English
In-depth study and discussion of a few American and/or British writers. Topics and approaches vary depending on instructors. Writing intensive. 4 cr.

513/513H. Survey of British Literature
Selected works in poetry and prose considered in chronological order and historical context. Attention to the works and to the ideas and tastes of their periods. Beowulf through 18th century. Writing intensive. 4 cr.

514/514H. Survey of British Literature
Selected works in poetry and prose considered in chronological order and historical context. Attention to the works and to the ideas and tastes of their periods. 1800 to the present. Writing intensive. 4 cr.

515/515H. Survey of American Literature
From the beginning of American literature to the Civil War. Writing intensive. 4 cr.

516/516H. Survey of American Literature
From the Civil War to the present. Writing intensive. 4 cr.

517/517H. Introduction to African American Literature and Culture
An introduction to African American literature in the context of a variety of cultural perspectives. Course topics may include major writers, literary genres, historical periods, Harlem Renaissance, Black Arts Movement, fine and folk arts, religion, music, and film. (Also offered as AMST 502.) Writing intensive. 4 cr.

518/518H. Bible as Literature
Literature of the Old and New Testaments and the Apocrypha, primarily in the King James version. Writing intensive. 4 cr.

521/521H. Nature Writers
Fiction, poetry, and nonfiction books on the natural environment. Such books as Thoreau's Walden or Maine Woods, Leopold's Sand County Almanac, Boston's Outermost House, Dillard's Pilgrim at Tinker Creek—books by naturalists who observe nature vividly and knowingly and who write out of their concern for the environment. Writing intensive. 4 cr.

522. American Literary Folklore
Folktales, songs, proverbs, beliefs, superstitions, and their use by such American authors as Irving, Hawthorne, Longfellow, Melville, Thoreau, Tawn, Frost, and Faulkner; some emphasis on oral folk culture of New Hampshire. Writing intensive. 4 cr.

523. Madness in Literature
How various writers depict insanity, and how they approach the problem of determining what attitudes and what behaviors are truly insane. Emphasis on 19th- and 20th-century works, but works from earlier periods also considered. Euripides' The Bacchae, Shakespeare's King Lear, Cervantes's Don Quixote, Hoffman's The Golden Pot, Dostoevsky's Note from the Underground, Robbe-Grillet's The Voyeur, Nabokov's Pale Fire, and other texts. Writing intensive. 4 cr.

#525. Popular Culture in America
Cultural expression in popular media. Verbal acts (best sellers, magazines, newspapers, speeches); some attention to television, film, comics, popular music. The multidisciplinary approach deals with historical context, cultural institutions, and distinction between "popular arts" and "great literature." Recurrent images, situations, and themes are investigated to see what values are celebrated and what fears are revealed. Writing intensive. 4 cr.

533/533H/533W. Introduction to Film Studies
A survey of the international development of the motion picture from the silent period to the present, emphasizing film's narrative practices. Introduces students to the study of the art, history, technology, economics, and theory of cinema. Films and film makers of various nations, periods, movements, and genres examined. Mandatory weekly screenings in addition to class. Students cannot receive credit for both ENGL 533 and CMN 550. Special fee. 4 cr. 533W is writing intensive.
540. Introduction to Native American Studies
Introduces the major critical and research methods in Native American literature, history, and culture. Course topics may include literary genres, historical periods, a focus on one particular tribe or culture area, art, and film. (Also offered as AMST 503.) 4 cr.

555. Introduction to Irish Studies
Introduces the history, literature, and politics of Modern Ireland from the perspective of the central problem in Irish culture: the legacy of both British and Gaelic traditions in the construction of Irish identity. Events covered include the Great Famine, the Irish Revival, and the "Troubles" in Northern Ireland. Authors studied may include Gaelic bards in translation, Swift, Goldsmith, Burke, Edgewood, Stoker, Wilde, Yeats, Joyce, Lady Gregory, Heaney, Friel, McCourt, and Ni Dhomhnall. Writing intensive 4 cr.

581/581H. Introduction to Postcolonial Literatures in English
Survey of contemporary Asian, African, and Caribbean fiction, drama, travelogues, essays, and poetry from the 1950s to the present. Introduces political, historical, and cultural contexts within which these forms are produced. Writing intensive. 4 cr.

#585/585H. Introduction to Women in Literature
Survey of images of women in literature. Context and approach vary depending on instructor. Writing intensive. 4 cr.

#586/586H. Introduction to Women Writers
Survey of women writers. Content and approach vary depending on instructor. Writing intensive. 4 cr.

595/595H. Literary Topics
Various faculty members investigate topics of special interest at a level appropriate for non-majors. Past topics have included Irish literature, animals in literature, and literature of the Vietnam War. See department for details of current offerings. Writing intensive 1 to 4 cr.

600. English as a Second Language
Designed for foreign graduate students in their first semester at UNH to give them English language skills necessary for effective graduate work at the university. Includes work on listening skills (understanding lectures, note-taking, etc.), reading skills, the writing of research papers, the making of oral reports, and general study skills, with work on grammar and pronunciation for those who need it. Credits may not be used to fulfill minimum degree requirements of a graduate program. Prereq: graduate students only. May be repeated for a maximum of 16 credits. Cr/F 1 to 16 cr.

605. Intermediate Linguistic Analysis
Introduces analysis methods and problem solving in phonology, morphology, and syntax using data from many languages. Emphasis will be both practical (learning how to describe the grammar and sound system of a language) and theoretical (understanding languages' behavior). Prereq: ENGL/LING 505, or permission. (Also offered as LING 605.) 4 cr.

#607. American Character: Religion in American Thought and Life
Interdisciplinary study of American religious experience and its relationship to other aspects of American culture, taught by a team of three specialists, each in a different discipline: American intellectual and cultural history, American literature, and American church history. Central emphasis on several transforming themes of the 19th century and their effects upon the interplay of religion and society. (Also offered as HIST 607, HUMA 607, and RS 607.) Writing intensive. 4 cr.

608. Arts and American Society: Women Writers and Artists, 1850-present
Team-taught course studying the impact of gender definitions on the lives and works of selected American artists. Considers lesser-known figures such as Fannie Fern, Lilly Martin Spencer, and Mary Hallock Foote as well as better-known artists such as Willa Cather and Georgia O'Keeffe. Prereq: permission or one of the following: WS 401, HIST 566, ENGL 585, 586, 685, 785, or a 600-level art history course. (Also offered as ARTS 608, HIST 608, and HUMA 608.) Writing intensive. 4 cr.

609. Ethnicity in America: The African American Experience in the 20th Century
Investigation of the music, literature, and social history of African American America in the period of the Harlem Renaissance, in the Great Depression, World War II, and in the 1960s. Special attention to the theme of accommodation with and rejection of dominant white culture. (Also offered as AMST 609, HUMA 609.) Writing intensive. 4 cr.

#610/610H. Regional Studies in America: New England Culture in Changing Times
Team-taught course investigating some of the major contributions New England has made to American life. Focusing on three periods: the Puritan era, 1620-90; the Transcendental period, 1830-60; and the period of emerging industrialism in the late 19th century. (Also offered as ARTS 610, HIST 610, and HUMA 610.) Not for art studio major credit. Writing intensive. 4 cr.

616. Studies in Film
Advanced, focused study of the narrative, dramatic, and poetic practices of cinema, within one of four possible subject areas: A) Genre; B) Authorship; C) Culture and Ideology; D) Narrative and Style. Precise issues and methods may vary, ranging from general and specific considerations of how a given subject area involves film theory, criticism, and history, to its use in diverse analyses of selected national cinemas, periods, movements, and filmmakers. Barring duplication of any four of the subject areas, and/or duplication of material taken for credit in CMN 570, course may be repeated for credit. Detailed course descriptions available in English department office during pre-registration. Prereq: ENGL 533, or CMN 530, or permission. Special fee. Writing intensive. 4 cr.

618. Film Theory
Examines basic theories of film and their relationship to the practice of close analysis of film. Theories are meant to provide students with a vocabulary for critical analysis and stress the many ways of seeing film. Prereq: ENGL 533 or CMN 550, or permission. Special fee. Writing intensive. 4 cr.

621. Newswriting
Workshops to develop reporting and writing skills. Prereq: B or better in ENGL 501 or equivalent, and written permission of instructor. May be repeated for credit with approval of journalism director. Special fee. Writing intensive. 4 cr.

622. Advanced Newswriting
An intermediate-level workshop on alternative methods of newswriting and the basics of feature writing. Students develop reporting skills while experimenting with styles and forms beyond the inverted pyramid. Prereq: B or better in ENGL 621 and written permission of instructor. May be repeated for credit with approval of journalism director. Special fee. Writing intensive. 4 cr.

623. Essay Writing
Intensive writing course emphasizing experimentation with a variety of essay forms. Also reading and discussion of contemporary essays. Prereq: B or better in ENGL 501 and written permission of instructor. May be repeated for credit with approval of journalism director. Special fee. Writing intensive. 4 cr.

625, 626. Writing Fiction
Workshop in the fundamental techniques of fiction writing. Students’ work is critiqued by fellow students; individual conferences with instructor. May be repeated for credit with approval of the department chairperson. Prereq: ENGL 501 with a B or better, or equivalent. Written permission of instructor required for registration. Special fee. Writing intensive. 4 cr.

627, 628. Writing Poetry
Workshop in the fundamental techniques of poetry writing. Class discussion and criticism of poems written by students. Individual conferences with instructor. May be repeated for credit with approval of the department chairperson. Prereq: ENGL 501 with a B or better, or equivalent. Written permission of instructor required for registration. May be repeated for credit with the approval of the department chairperson. Special fee. Writing intensive. 4 cr.

630. Poetry
American and British poetry, Various poetic techniques and their demonstration. See course descriptions available in department office for further information. (Not offered each semester.) Writing intensive. 4 cr.

631. Drama
Nature and types of drama illustrated by major English, American, and (translated) European plays. How to read a play. Live and filmed performances studied as available. Writing intensive. 4 cr.

632. Fiction
Modern novels and/or short stories. The way in which fiction communicates its meanings; the tools and methods at the fiction writer's disposal, primarily as they function in individual works. See course descriptions available in department office for further information. (Not offered each semester.) Writing intensive. 4 cr.
649. Studies in British Literature and Culture
Special topics in British studies, varying from year to year. (Not offered every year.) Writing intensive. 4 cr.

650. Studies in American Literature and Culture
Special topics in American studies, varying from year to year. (Not offered every year.) Writing intensive. 4 cr.

651. Comparative Literature
Comparative studies of major authors representative of important periods of world literary achievement. Homer to Dante; common themes and the Ten major plays representative of the main intensive.

652. Comparative Literature
Comparative studies of major authors representative of important periods of world literary achievement. Renaissance to modern. Topics and approaches vary from semester to semester. Writing intensive. 4 cr.

655. Chaucer
Study of Chaucer's earlier works in the context of their continental sources and analogues. All readings in translation. Writing intensive. 4 cr.

657/657H. Shakespeare
Ten major plays representative of the main periods of Shakespeare's career and the main types of drama which he wrote (tragedy, comedy, history). Live and filmed performances included as available. Restricted to undergraduates and designed for both English majors and students majoring in other fields. Writing intensive. 4 cr.

680. Early British Drama
A survey of the development of British drama from the Middle Ages to the closing of the theatres in 1642. 4 cr.

681. Introduction to African Literatures in English
In-depth study of writers, literary movements, political contexts, and historical pressures that have shaped and continue to shape African literatures in the colonial and postcolonial periods. Primary focus on Anglophone texts but possibly some literature in translation. Writing intensive. 4 cr.

685. Women's Literary Traditions
Intensive study of themes, topics, and techniques in women's literature. Topics vary from year to year. Writing intensive. 4 cr.

690. Introduction to African American Literature in America
Selected prose, fiction, drama, and poetry. Individual works and historical-cultural background. Course varies from year to year. Writing intensive. 4 cr.

693, 694. Special Topics in Literature
A) Old English Literature, B) Medieval Literature, C) 16th Century, D) 17th Century, E) 18th Century, F) English Romantic Period, G) Victorian Period, H) 20th Century, I) Drama, J) Novel, K) Poetry, L) Nonfiction, M) American Literature, N) A Literary Problem, O) Literature of the Renaissance. The precise topics and methods of each section vary. Barring duplication of subject, course may be repeated for credit. For details, see course descriptions available in the English department. (Not offered every year.) Special fee on some topics. Writing intensive. 4 cr.

701. Advanced Writing of Fiction
Workshop discussion of advanced writing problems and readings of student's fiction. Individual conferences with instructor. Prereq: 625, 626, or equivalent; written permission of instructor required for registration. May be repeated for credit with the approval of the department chairperson. Special fee. Writing intensive. 4 cr.

703, 704. Advanced Nonfiction Writing
Workshop course for students intending to write publishable magazine articles or nonfiction books. Equal stress on research and writing techniques. Prereq: B or better in ENGL 722 and written permission of the instructor. May be repeated for credit with approval of journalism director. Special fee. Writing intensive. 4 cr.

705. Advanced Writing of Poetry
Workshop discussion of advanced writing problems and submitted poems. Individual conferences with instructor. Prereq: ENGL 627, 628, or equivalent; written permission of the instructor. May be repeated for credit with the approval of the department chairperson. Special fee. Writing intensive. 4 cr.

707. Form and Theory of Fiction
A writer's view of the forms, techniques, and theories of fiction. The novels, short stories, and works of criticism studied vary, depending on the instructor. Writing intensive 4 cr.

708. Form and Theory of Nonfiction
A writer's view of contemporary nonfiction, emphasizing the choices the writer faces in the process of research writing. (Not offered every year.) Writing intensive. 4 cr.

709. Form and Theory of Poetry
A writer's view of the problems, traditions, and structures of poetry. Writing intensive. 4 cr.

710. Teaching Writing
Introduction to the various methods of teaching writing. Combines a review of theories, methods, and texts with direct observation of teaching practices. Writing intensive. 1 to 6 cr.

711. Editing
Emphasis on newspaper editing but principles applicable to magazine and book editing are also covered. Credit in ENGL 621 and written permission of instructor. Special fee. Writing intensive. 4 cr.

713, 714. Literary Criticism
Major critics from Plato to the present; the chief critical approaches to literature. (Not offered every year.) Writing intensive. 4 cr.

715. Teaching English as a Second Language: Theory and Methods
How linguistic, psychological, sociological, and neurological theory influence or even determine the choice methods of language teaching. Research on second language acquisition and bilingualism, language aptitude, and the cultural context of language acquisition. Introduction to standard and exotic methods of language teaching. Writing intensive. 4 cr.

716. Curriculum, Materials and Assessment in English as a Second Language
Study of the problems in designing an effective teaching program for various types of ESL students. Competence and aptitude testing; choosing and adapting materials for ESL classes. Writing intensive. 4 cr.

717. World Englishes
Study of the forms and functions of Englishes in various parts of the world and the linguistic, sociolinguistic, literary, pedagogical, and political implications of the worldwide spread of the language. Topics include language change, language policies, language and power, language and culture, language and identity, literary creativity, and linguistic imperialism. (Also listed as LING 717) Writing intensive. 4 cr.

718. English Linguistics and Literature
Introduction to linguistics for students of literature. Includes a survey of the grammar of English (phonology, morphology, syntax, dialect variation, historical change) with applications to the analysis of the language of poetry and prose. (Not offered every year.) Writing intensive. 4 cr.

719. Sociolinguistics Survey
How language varies according to the characteristics of its speakers: age, sex, ethnicity, attitude, time, and class. Quantitative analysis methods; relationship to theoretical linguistics. Focus is on English, but some other languages are examined. Prereq: 505 or permission. 4 cr.

720. Journalism Internship
Students intending to pursue careers in journalism spend a semester working full or part time for a daily newspaper under close supervision of editors. Reporting is stressed; but students may do some editing as well. The number of internships is very limited. Prereq: ENGL 622 required; ENGL 722 recommended; permission. Special fee. Writing intensive. 1 to 16 cr.

721. Advanced Reporting
Students learn advanced techniques for developing story ideas and acquiring information from people and documents. Discussion of legal and ethical issues facing reporters. Prereq: ENGL 621 and written permission. Special fee. Writing intensive. 4 cr.

722. Feature Writing
Students refine interviewing, reporting, and writing techniques. Emphasis on in-depth features. Prereq: B or better in ENGL 621 and 622, and written permission of instructor. Special fee. Writing intensive. 4 cr.

723. Issues in Journalism
This upper-level seminar focuses on the shifts in technology and public perception that are changing the definition of excellence in journalism. Special attention to legal and ethical issues reshaping journalism's public service role. Prereq: Grade of B in ENGL 621 and written permission. May be repeated once for credit with permission of the journalism director. Special fee. Writing intensive. 4 cr.

725, 726. Seminar in English Teaching
In this seminar on teaching English at the middle- and secondary-school levels, students meet the requirements for both English 710, Teaching Writing and English 792, Teaching Secondary School English. The two-semester course integrates the teaching of reading, writing, speaking, and listening, addressing both theoretical and practical issues. Through the study of different approaches, students develop their own philosophies of teaching. Writing intensive. 4 cr.

727. Issues in Second Language Writing
Study of various issues in second language writing theory, research, instruction and administration. Topics include the characteristics and needs of second language writers, second language writing
processes, contrastive rhetoric, grammar instruction, teacher and peer feedback, assessment, course design and placement. Writing intensive. 4 cr.

728. Writing Consultation and Assessment
Includes instruction in philosophy and techniques of tutoring, theoretical and practical issues in collaborative learning and complex-skill formation, and cross-disciplinary conventions of writing. In addition to the classroom portion of the course, each student undertakes a supervised practicum experience in the University Writing Center. Prereq: ENGL 501 or 503. Coreq: supervised practicum experience in the Writing Center. Writing intensive. 4 cr.

729. Special Topics in Composition Studies
Advanced course on a topic chosen by the instructor. Precise topics and methods of each section vary. Possible topics include alternative discourses and rhetorics, contrastive rhetoric, electronic discourse and digital rhetoric, women's rhetorics and feminist pedagogies, Montaigne and the essay tradition, theories of literacy, theories of persuasive writing, theories of transactional writing, and written discourse analysis. Barraging duplication of subject, may be repeated for credit. For details see descriptions available in the English Department. 4 cr.

730. Folklore and Folk Life
Examines the materials and methods used to study folk life, emphasizing the historical context and development of folklore studies in North America and Europe, field research, performance theory, and other topics. (Also offered as ANTH 698.) Writing intensive. 4 cr.

731. Special Studies in Film
Specialized and advanced study in film and cinema studies. Topics vary and may include literature and film, Asian-American film, film genres, and advanced film theory. May be repeated once for credit as long as topics are different. Special fee. 4 cr.

732. Topics in Asian American Studies
Study of the literature, history, scholarship, and current thought by and about Asian America. Representative works from among Japanese Americans, Chinese Americans, Korean Americans, Southeast Asian Americans, and South Asian Americans. (Also listed as AMST 615.) Writing intensive. 4 cr.

733. American Indian Literature
Close study of traditional and/or contemporary American Indian literature and folk lore with historical and cultural background. Writing intensive. 4 cr.

740. Indigenous New England
An interdisciplinary introduction to the literatures, histories, and cultures of indigenous people located in what is now called New England. Course topics may include U.S. American Indian policy, tribal governmental structures and resistance, the history and forms of indigenous literary, contemporary sovereignty struggles, popular culture, and film. Curricular activity with regional Native people required such as a visit to a Native community, work with tribal guest speakers, participation in a lecture or film series. Special fee. (Also offered as AMST 611.) 4 cr.

741. Literature of Early America
Prose and poetry of the periods of exploration, colonization, early nationalism, Puritanism, Enlightenment. Individual works and historical-cultural background. (Not offered every year.) Writing intensive. 4 cr.

742. American Literature, 1815-1865
Fiction, nonfiction, and poetry in the period of romanticism, transcendentalism, nationalism. Individual works and cultural background. (Not offered every year.) Writing intensive. 4 cr.

743. American Literature, 1865-1915
Fiction, nonfiction, and poetry in the period of realism, naturalism, industrialism, big money. Individual works and background. Writing intensive. 4 cr.

744. American Literature, 1915-1945
Fiction, poetry, and drama in the period of avant-garde and leftism, jazz age, and Depression. Individual works and cultural background. Writing intensive. 4 cr.

745. Contemporary American Literature
A gathering of forms, figures, and movements since 1945. Individual works and cultural background. Writing intensive. 4 cr.

746. American Literature, 1865-1915
Fiction, nonfiction, and poetry in the period of realism, naturalism, industrialism, big money. Individual works and background. Writing intensive. 4 cr.

747. American Literature, 1915-1945
Fiction, poetry, and drama in the period of avant-garde and leftism, jazz age, and Depression. Individual works and cultural background. Writing intensive. 4 cr.

748. American Literature, 1915-1945
Fiction, poetry, and drama in the period of avant-garde and leftism, jazz age, and Depression. Individual works and cultural background. Writing intensive. 4 cr.

749. Major American Authors
Intensive study of two or three writers. Examples: Melville and Faulkner; Fuller, Emerson, and Thoreau; James and Wharton; Dickinson and Frost. Writing intensive. 4 cr.

750. Special Studies in American Literature
Topics vary from year to year. Examples: the Puritan heritage, ethnic literatures in America, landscape in American literature, five American lives, pragmatism, American humor, transcendentalism, women regionalists. Writing intensive. 4 cr.

751. Medieval Epic and Romance
The two major types of medieval narrative; comparative study of works from England, France, Germany, and Iceland, including Beowulf, Song of Roland, the Nibelungenlied, Njal’s Saga, and Malory’s Morte d’Arthur. All works read in modern English translations. (Not offered every year.) Writing intensive. 4 cr.

752. History of the English Language
Evolution of English from the Anglo-Saxon period to the present day. Relations between linguistic change and literary style. (Not offered every year.) Writing intensive. 4 cr.

753. Old English
Introduction to Old English language and literature through the reading of selected poetry and prose. 4 cr.

754. Beowulf
A reading of the poem and an introduction to the scholarship. Prereq: ENGL 753. Writing intensive. 4 cr.

755. Chaucer
Troilus and Criseyde, in the context of medieval continental literature by Boccaccio and other influences. Writing intensive. 4 cr.

756. Chaucer
The Canterbury Tales in its original language. Writing intensive. 4 cr.

759. Milton
Milton and his age. Generous selection of Milton’s prose and poetry, with secondary readings of his sources and contemporaries. (Not offered every year.) Writing intensive. 4 cr.

760. Continental Backgrounds of the English Renaissance
Major philosophers, artists, and writers of the continental Renaissance (in translation). Petrarch, Ficino, Pico, Vives, Valla, Castiglione, Machiaveli, Luther, Calvin, Rabelais, Montaigne, Cervantes, Erasmus, and Thomas More, as representative of the early English Renaissance. (Not offered every year.) Writing intensive. 4 cr.

761. Prose and Poetry of the Elizabethans
Shakespeare and his contemporaries. Major works, including Spenser’s Faerie Queene, Sidney’s Astrophel and Stella, and Shakespeare’s Sonnets: their literary and intellectual backgrounds. (Not offered every year.) Writing intensive. 4 cr.

762. English Literature in the 17th Century
Major writers of the 17th century, including Donne, Johnson, Herbert, Bacon, and Hobbes. (Not offered every year.) Writing intensive. 4 cr.

763. Literature of the Restoration and Early 18th Century
Poetry, drama, fiction, letters, journals, and essays from the period following the restoration of Charles II to the throne of England after the English Civil War. Works by such figures as John Dryden, Aphra Behn, Daniel Defoe, Jonathan Swift, Alexander Pope, and Lady Mary Wortley Montagu studied in the historical context. Examples from the colonial world and the continent (in translation) when appropriate. Writing intensive. 4 cr.

764. Literature of the Later 18th Century
Poetry, drama, fiction, letters, journals, essays, and biography from the period that culminated in the American and French Revolutions. Works by such figures as Henry Fielding, Samuel Johnson, Frances Burney, Laurence Sterne, William Blake, and Mary Wollstonecraft studied in historical context. Examples from the colonial world and the continent (in translation) when appropriate. Writing intensive. 4 cr.

765. English Romantic Period
Major literary trends and authors, 1798 to 1832. Focus on poetry but attention also to prose works and critical theories. Wordsworth, Coleridge, Lamb, Hazlitt, DeQuincey. (Not offered every year.) Writing intensive. 4 cr.

766. English Romantic Period
Major literary trends and authors, 1798 to 1832. Focus on poetry but attention also to prose works and critical theories. Byron, Shelley, Keats. (Not offered every year.) Writing intensive. 4 cr.

767. English Victorian Period
Fiction, nonfiction, and poetry from 1832-1870. The growth of the city and middle-class life, particular emphasis on money and love. Authors include Charlotte and Emily Bronte, Charles Dickens, E.B. Browning, A.L. Tennyson. (Not offered every year.) Writing intensive. 4 cr.
#772. English Victorian Period
Fiction, nonfiction, and poetry from 1870-1900. The social conflicts created by gender politics and imperial expansion, with particular emphasis on aesthetics and gothic horror. Thomas Hardy, Oscar Wilde, R.L. Stevenson, Bram Stoker. (Not offered every year.) Writing intensive. 4 cr.

773. British Literature of the 20th Century
Poets and novelists of the modernist and postmodernist periods. W.B. Yeats, James Joyce, Virginia Woolf, E.M. Forester, D.H. Lawrence, and other modernists. Writing intensive. 4 cr.

774. British Literature of the 20th Century
Poets and novelists of the modernist and postmodernist periods. A selection of postmodernist or contemporary writers, such as William Golding, Doris Lessing, John Fowles, Philip Larkin, Seamus Heaney, Margaret Drabble, and others. Writing intensive. 4 cr.

775. Irish Literature
Survey from the beginnings to present; works in Irish (read in translation) such as The Cattle Raid of Cooley, medieval lyrics, and Mad Sweeney; and works in English from Swift to the present. 20th-century authors: Joyce, Yeats, Synge, O'Casey, Beckett, and Flann O'Brien. (Not offered every year.) 4 cr.

777. Postcolonial Novel
Representative novels from writers such as Salman Rushdie, Amitava Ghosh, Bapsi Sidhwa, R. K. Narayan, Raja Rao, Romesh Gunesekara, Arundhati Roy, Mahasweta Devi, U.R. Ananthamurthy, and others. Study of the development of the novel in English in South Asia from the mid-nineteenth century to the present day. Focus is on novels originally written in English; English translations from other South Asian languages when appropriate. 4 cr.

779. Linguistic Field Methods
Study of a non-Indo-European language by eliciting examples from an informant, rather than from written descriptions of the language. Students learn how to figure out the grammar of a language from raw data. Prereq: ENGL/LING 505. (Also offered as LING 779.) Special fee. (Not offered every year.) Writing intensive. 4 cr.

780. Drama of Shakespeare's Contemporaries
Study of the drama of Renaissance England, emphasizing Tudor and Stuart drama. Special attention to dramatic forms, acting conventions, theatre architecture, women as patrons, writers, and subjects of drama, and the politics and social significance of theatre in the period. Writing intensive. 4 cr.

781. English Drama, 1660-1800
Study of the selected plays, their performance and their publication. Works by such figures as William Wycherley, Thomas Otway, Mary Pix, George Lillo, Susanna Centlivre, Richard Sheridan, and Elizabeth Inchbald. Special attention to the new prominence of women in the drama of this period, changes in theatre architecture, forms of nonnaturalistic spectacle, and the political and social significance of drama. Writing intensive. 4 cr.

#782. Modern Drama
Major English, American, and (translated) European plays of the modern period by such playwrights as Shaw, Ibsen, Chekhov, Strindberg, Pirandello, O'Neill, Brecht, Beckett, Williams, Miller, Pinter. Live and filmed performances studied as available. (Not offered every year.) Writing intensive. 4 cr.

783. English Novel of the 18th Century
Study of the rise and development of the novel in the eighteenth century. Works by such figures as Daniel Defoe, Eliza Haywood, Samuel Richardson, Henry Fielding, Charlotte Lennox, Laurence Sterne, Frances Burney, and Jane Austen. Focus on writers who published their work in England but with examples from the colonial world and the continent (in translation) when appropriate. Writing intensive. 4 cr.

784. English Novel of the 19th Century
Representative novels from among Austen, Scott, Dickens, Thackeray, Emily Bronte, Charlotte Bronte, Trollope, George Eliot, Hardy, and Conrad. Writing intensive. 4 cr.

785. Major Women Writers
Intensive study of one or more women writers. Selections vary from year to year. Writing intensive. 4 cr.

#786. 20th Century British Fiction
Traces the development of the novel from the turn of the century to the present day. Representative novels by Lawrence, Joyce, Conrad, Wolf, West, Forester, Huxley, Waugh, Murdoch, Burgess, and Lessing. Writing intensive. 4 cr.

787. English Major Seminar
Intensive study of specialized topics that vary from year to year. Enrollment in each seminar is limited to 15 so that all students can take an active part in discussion and work closely with the instructor on their papers. Prereq: a grade of B or better in ENGL 419, and permission. For details, see course description available in the department office. Writing intensive. 4 cr.

788. Senior Honors
Open to senior English majors who, in the opinion of the department, have demonstrated the capacity to do superior work; permission required. An honors project consists of supervised research leading to a substantial thesis or writing of poetry or fiction portfolio. Required of students in the honors in major program. (Not offered every year.) Writing intensive. 4 cr.

790. Special Topics in Linguistics
Advanced course on a topic chosen by the instructor. Inquire at the English department office for a full course description each time the course is offered. Topics such as word formation, dialectology, linguistic theory and language acquisition, history of linguistics, language and culture, cross-disciplinary studies relating to linguistics. Barrning duplication of subject, may be repeated for credit. (Also offered as LING 790.) Writing intensive. 4 cr.

791. English Grammar
Survey of the grammar of English (pronunciation, vocabulary, sentence structure, punctuation, dialect variation, historical change) with special attention to the distinction between descriptive and prescriptive grammar and to the problems students have with formal expository writing. Writing intensive. 4 cr.

792. Teaching Secondary School English
Methods of teaching language, composition, and literature in grades 7-12. Required of all students in the honors in major program. Open to others with permission. Writing intensive. 4 cr.

793. Phonetics and Phonology
The sound system of English and other languages as viewed from the standpoint of modern linguistic theory, including the following topics: the acoustic and articular properties of speech sounds, the phonemic repertoires of particular languages, phonological derivations, and prosodic phenomena such as stress and intonation. (Also offered as LING 793.) Prereq: a basic linguistics course or permission. 4 cr.

794. Syntax and Semantic Theory
Relationship of grammar and meaning as viewed from the standpoint of modern linguistic theory. Emphasizes the syntax and semantics of English, with special attention to the construction of arguments for or against particular analyses. (Also offered as LING 794.) Prereq: a basic linguistics course or permission. Writing intensive. 4 cr.

795. Independent Study
Open to highly qualified juniors and seniors. To be elected only with permission of the department chairperson and of the supervising faculty member or members. Barrning duplication of subject, may be repeated for credit. For details, see the course descriptions available in the English department. Special fee on some topics. Writing intensive. 2 to 6 cr.

Environmental Engineering (ENE)
(For program description, see page 64.)

400. Environmental Engineering Lectures I
Introduces the profession, the environmental engineer as planner, designer, problem solver, and interdisciplinary team player; and the goals of the environmental engineering curriculum. Lectures by faculty and practitioners. Introduction to computer skills required for environmental engineering. Engineering ethics. Cr/F. 1 cr.

401. Environmental Engineering Lectures II
Introduces the concept of integrated design and project planning and management in environmental engineering. Field trips to environmental engineering sites and projects. Prereq: ENE 400. Cr/F. 1 cr.

520. Environmental Pollution and Protection: A Global Context
Anthropogenic causes of environmental change. Emphasizes the causes, effects, and controls of air, water, and land pollution. The political, ecological, economic, ethical, and engineering aspects of environmental pollution and control are discussed. Field trips. Writing intensive. 4 cr.

521. Seminar
Introduces the fundamentals of environmental and occupational health, water quality modeling, and atmospheric systems and air pollution control. Prereq: ENE 520, MATH 426, CHEM 404, PHYS 407. 1 cr.
608. Industrial Process and Design
Introduces cost engineering. Application of acquired skills to design of chemical processes. Individual major design project required. Safety for industrial processes. Lab. (Also offered as CHE 608.) Writing intensive. 4 cr.

612. Unit Operations Laboratory I
Selected experiments in fluid mechanics, heat transfer, and unit operations, with emphasis on environmental engineering. Writing intensive. 3 cr.

613. Unit Operations Laboratory II
Selected experiments in mass transfer, stagewise operations, thermodynamics, and kinetics with emphasis on environmental engineering. Writing intensive. 3 cr.

645. Fundamental Aspects of Environmental Engineering
Application of fundamental concepts of mass balance in treatment processes. Physical, chemical, and biological aspects of pollution control, and design concepts for operations and processes used in environmental engineering are discussed. Concepts of engineering ethics are presented. Students participate in a design project that involves an oral presentation and written report. Prereq: ENE 404, CIE 642, ENE 520; or permission. Writing intensive 4 cr.

696. Field Experience
Based on appropriate career-oriented work experience in environmental engineering. Student can get one credit for field experience. A written final report is required as well as permission of student’s adviser. 1 cr.

697. Internship
Off-campus work in the environmental engineering field for on-the-job skill development. Needs to be supervised by an environmental engineering faculty member; and a proposal for the internship must be submitted and have permission of the ENE faculty prior to the start of the internship. Prereq: permission. IA (continuous grading). 2 cr.

709. Fundamentals of Air Pollution and Its Control

740. Public Health Engineering
Proper application of environmental engineering and sanitation principles in disease prevention and control is discussed. Special emphasis is given to rural communities and areas of the world where communicable and related diseases have not yet been brought under control, and to what can happen in the more advanced countries when basic sanitary safeguards are relaxed. Topics covered: vector-borne diseases and control, safe water supply development and treatment, and on-site wastewater disposal systems. Prereq: MATH 425, ENE 520. 3 cr.

742. Solid and Hazardous Waste Engineering
A thorough examination of the problems that exist in hazardous and solid waste management are presented in terms of the current regulations and engineering approaches used to develop solutions. Topics include risk-based decision making, transport and fate of contaminants, and the fundamental physical, chemical, and biological concepts, which make up the basis for technological solutions to these waste management problems. Case studies are used throughout the course to highlight key concepts and provide real-world examples. Prereq: ENE 645 or permission. 3 cr.

743. Environmental Sampling and Analysis
Theory of analytical and sampling techniques used in environmental engineering. Topics include potentiometry, spectroscopy, chromatography, automated analysis, quality control, sampling design, and collection methods. Methods discussed in lecture are demonstrated in labs. Prereq: CHEM 404 and ENE 645 or permission. Lab. Writing intensive. 4 cr.

744. Physicochemical Treatment Design
Selection, design, and evaluation of advanced unit processes employed in physicochemical treatment of waters, wastewaters, and hazardous wastes. Discusses preparation of alternative designs and economic analysis. Emphasizes treatment schemes based on experimental laboratory or pilot studies. Prereq: ENE 645; 749 or permission. Lab. 4 cr.

746. Bioenvironmental Engineering Design
Selection, design, and evaluation of unit processes employed in biological treatment of waters, wastewaters, and hazardous wastes. Preparation of engineering reports, including developing design alternatives and economic analysis, is required. Prereq: ENE 645 and ENE 756 or permission. Writing intensive. 4 cr.

#747. Introduction to Marine Pollution and Control
Introduces the sources, effects, and control of pollutants in the marine environment. Dynamic and kinetic modeling; ocean disposal of on-shore wastes, shipboard wastes, solid wastes, dredge spoils, and radioactive wastes; and oil spills. Prereq: ENE 645 or permission. 3 cr.

748. Solid and Hazardous Waste Design
Selection, design, and evaluation of unit processes employed in the treatment of solid wastes and hazardous wastes will be studied. Topics include design of materials recovery facilities, landfills, waste-to-energy facilities and hazardous waste site remedial technologies. A group term project taken from a real-world project will be required. An oral presentation by the group and preparation of a final written engineering report including alternative evaluation, permits, scheduling and economic analysis will be required from each group. Prereq: ENE 742 or permission. Writing intensive. 4 cr.

749. Water Chemistry
Emphasizes the use of chemical equilibrium principles and theory, calculations, and applications of ionic equilibrium stresses. Topics include thermodynamics, kinetics, acid/base, complexation, precipitation/dissolution, and redox equilibria. Computer equilibrium modeling is presented. Prereq: CHEM 404 or CHEM 405. 4 cr.

752. Process Dynamics and Control
Dynamic behavior of chemical engineering processes described by differential equations, feedback control concepts and techniques, stability analysis, application in pollution control. Lab. (Also listed as CHE 752.) 4 cr.

756. Environmental Engineering Microbiology
Concepts of environmental engineering microbiology. Topics include taxonomy of species important in environmental engineering processes; microbial metabolism, interaction, and growth kinetics in environmental treatment processes; biogeochemical cycling in water; and effects of environmental parameters on environmental engineering microbial processes. Laboratories focus on microbiological methods and laboratory-scale biological treatment experiments. Prereq: ENE 520 and EIE 642 or permission. Lab. Writing intensive. 4 cr.

772. Physicochemical Processes for Water and Air Quality Control
Origin and characterization of pollutants. Controls, including filtration, sedimentation, coagulation and flocculation, absorption and adsorption. Applied fluid mechanics, mass transfer, and kinetics. Thermal pollution, chemical treatment, oil spills on water, and aeration. Lab. 4 cr.

788. Project Planning and Design
Student groups formed in multidisciplinary design teams to prepare a design plan for a large-scale environmental engineering system including consideration of budgetary constraints, regulatory requirements, and environmental impacts. Each team prepares a final written report and gives a formal presentation. Prereq: senior environmental engineering major or permission. Writing intensive. 4 cr.

795. Independent Study
A limited number of qualified seniors is permitted to pursue independent studies under ENE faculty guidance. Seniors write terminal thesis reporting the results of their investigations. May be repeated. Prereq: permission of ENE faculty member involved. 1 to 4 cr.

799H. Senior Honors Thesis
Students in the honors program in environmental engineering complete a project under the direction of a faculty sponsor resulting in a written thesis which must be accepted by the sponsor by the end of the second semester, senior year. Four credits total during senior year; 3 of which may be used to fulfill an ENE non-design elective. 4 cr.

Environmental & Resource Economics (EREC)
(For program description, see page 93.)

#403. World Resources
Overview of status of the world's environmental and natural resources and factors, including social values, customs and preferences, social, cultural and political institutions, population growth, economic growth and development, and government policies that influence people's use of those resources. Emphasizes a global perspective and economic and social dimensions of natural resource use. 4 cr.

409. Catastrophe and Terrorism
Impacts of terrorism and natural and non-natural catastrophes on infrastructure, public and private policy, and the economy. Analysis of case studies and research data is emphasized. Invited speakers complement lectures and assignments. 4 cr.

411. Environmental and Resource Economics Perspectives
Microeconomic theory and analysis in resource management and use decisions. Survey of signifi-
certain resource problems from an economic perspective and the application of economic analysis. Cannot take for credit after ECON 402 or equivalent. Special fee. 4 cr.

501. Agriculture and Natural Resource Product Marketing
Structure, organization, strategies and performance of the business sector in agriculture, forestry, and other local natural resource-based industries; commodity marketing systems; demand estimation, pricing policies, consumer characteristics, and related topics. Prereq: EREC 411 or equivalent or permission. (Offered every other semester.) 4 cr.

504. Business Management for Natural Resource Firms
Planning, operation, and control of natural resource-based firms with direct application to agriculture, aquaculture, forestry, and recreational businesses. Emphasis on decision making, problem solving, and operational strategies. Prereq: EREC 411 or equivalent. Lab. 4 cr.

525. Statistical Methods and Applications
Applications of elementary statistical concepts and methods including probability, descriptive techniques, statistical inference and bivariate and multivariate statistical analysis. Orientation is toward analysis and interpretation of data commonly encountered in social science disciplines. No credit for students who have completed ADM 430; BIOL 528; ADMN 420; HHS 546; MATH 619; MATH 644; PSYC 402; SOC 502. 4 cr.

572. Introduction to Natural Resource Economics
Introduces theory, methods of analysis, and current literature of natural resource economics and policy. Topics include multiple use, taxation, optimal harvest scheduling, market failure, property rights, public goods, benefit-cost analysis, amenity values, non-market resource services and natural resource policy. Topics applied to forests and forestry, wildlife management, outdoor recreation, public lands, agriculture, fisheries, water, energy and mining/nonrenewable resources. 4 cr.

595/595W, 596/596W. Problems in Natural and Agricultural Resources
Students pursue field, laboratory, or library problems in natural and environmental resources that are not covered by other courses. Faculty consultant and study topic must be chosen before registration. In consultation with the faculty adviser, students select the problem area, create a bibliography for reflection, and pursue the topic. A professionally written paper is expected at termination of the study. May be repeated once for credit. Prereq: permission. 2 to 4 cr. 595W and 596W are writing intensive.

600/600W. Field Experience
A supervised experience providing the opportunity to apply academic experience in settings associated with future professional employment and/or related graduate opportunities. Must be approved by a faculty adviser selected by the student. May be repeated to a maximum of 8 credit hours. Prereq: permission. Cr/F. 1 to 4 cr. 600W is writing intensive.

606. Land Economics Perspectives: Uses, Policies, and Taxes
Economic and institutional perspectives affecting human use of land resources; discussion of land ownership patterns and uses; land rent, location, and resource use; institutional constraints; partial ownership policies; and local planning for more efficient use of land. Real estate markets, transfere, valuation, and taxation. Prereq: EREC 411 or equivalent or permission. Special fee. 4 cr.

Environmental Economics for Non-Economists
This course will examine different aspects of natural resource allocation and protection of environmental quality from an economic standpoint. The course will examine the economic factors which lead to environmental problems such as air and water pollution, the common property problem, and other areas where existing markets do a less than satisfactory job of resource allocation. Economic incentives for alleviating these environmental problems will also be surveyed. Specific topics covered will include benefit cost analysis, valuation of "nonmarket" goods, policy tools which have economic bases, and sustainable development. Where possible, guest lecturers from other disciplines and selected films will be used to present alternative viewpoints and stimulate discussion. Class participation is encouraged and expected. Students completing this course will gain an overview of key issues in environmental economics, and how economics can be used as an aid in policy decisions regarding natural resources. Prereq: EREC 411, ECON 401 or their equivalents or permission. Does not count toward major requirements for EREC electives. 4 cr.

611. Marine Resource Economics
Economic overview of the marine environment; interactions/conflicts surrounding this multiple-use resource. Economics of fisheries, marine recreation, offshore facilities, aquaculture, waste disposal. Prereq: EREC 411 or equivalent or permission. (Offered every other semester.) 4 cr.

627. Community Economics
Economic factors affecting community and local government decisions. Emphasizes use of economic theory for decision making and community problem solving. Prereq: EREC 411 or equivalent. 4 cr.

633. Economics of Travel and Tourism
Provides an understanding of both the microeconomic and macroeconomic aspects of travel and tourism. Using economics as a theory base, the course attempts to identify what is significant or special about travel and tourism compared with other activities. Special attention is given to issues such as resource immobility, capacity constraints, seasonality, and consumers' inability to experience the product before purchase. Prereq: EREC 411 or equivalent. (Also offered as TOUR 633.) 4 cr.

676. Economics of Water Use and Quality Management
Economics of water use; role of government and policy agencies, water supply and demand, economic impact of water and water quality standards, alternatives in quality management, externalities, and methods of evaluation. Prereq: elementary biological or physical science (or NR 504); EREC 411 or equivalent. 4 cr.

708. Environmental Economics
Environmental pollution, the market economy, and optimal resource allocation; alternative control procedures; levels of environmental protection; and public policy; property right issues. Prereq: intermediate microeconomic theory; permission. Writing intensive. 4 cr.

710. Seminar
Seminars arranged to students' needs and offered as demand warrants: A) Rural Development, B) Marine Economics, C) Community Economics, D) Land and Water Economics, E) Quantitative Methods, F) Recreation Economics, G) Small Business Economic and Managerial Issues. In-depth treatment of area, including classic works. May be repeated. 2 to 4 cr.

715. Linear Programming and Quantitative Models
Solving applied economic problems using linear and nonlinear techniques with emphasis on problem specification and interpretation of model results. Unit of analysis includes individuals, firms, or communities as they address contemporary problems dealing with resource allocation, product distribution, and whole-firm organization. Computer applications on both mainframe and personal computers utilized for managerial decision making. Project required. Prereq: permission. Writing intensive. 4 cr.

756. Rural and Regional Economic Development
Concepts and methods of delineating regional economic, methods of measuring activity, regional development, and public policies. Emphasizes empirical research studies. Prereq: intermediate economic theory or permission. Writing intensive. 4 cr.

775. Research Methods
Study of the process, methods, and techniques of conducting scientific research in the social sciences. Includes problem identification, data collection and management, qualitative and quantitative data analyses, and communicating scientific research. Prereq: EREC 411 or equivalent; EREC 525 or equivalent; junior/senior standing. 4 cr.

795/795W. Investigations
Special assignments in readings, investigations, or field problems. Topics may include agricultural marketing, agricultural production and farm management, community development, economics of human resources, economics of population and food, land economics, marine economics, rural economic development, regional economics, water economics, or teaching experience. Prereq: permission. May be repeated. 2 to 4 cr. 795W is writing intensive.

799. Honors Senior Thesis
Students develop and conduct individual research projects related to applied resource economics under the direction of a senior thesis committee. The resulting written thesis is defended in an oral presentation before departmental faculty and students. Prereq: permission, majors only, senior standing. Writing intensive. 4 cr.

European Cultural Studies (ECS)
(For program description, see page 36.)

400. Europe
Introduction to the European Cultural Studies major. Outlines the general patterns of change and explores some of the local themes and variations in different parts of Europe. Students become aware of the social, political, literary, artistic and cultural issues that contributed to Europe's identity formation. Special fee. 4 cr.

500. Proseminar
The Proseminar aims to expose students to a variety of approaches in the Cultural Studies field, drawing on different disciplines and focusing on representative themes within cultural studies. 4 cr.
550. Critical Methods in Cultural Studies
Critical analysis of works in Cultural Studies. Focus on major texts, evaluation of secondary texts, research writing, criticism. Required of all ECS majors. (Also listed as HUMA 500.) 4 cr.

798. Thesis Research
Part of a two-semester capstone experience for the ECS major. Students work with their advisors and peers to formulate their topic, write a major research paper, and complete a bibliography for a thesis on a topic related to European Cultural Studies. During the course of the semester, students meet regularly with their adviser to discuss research materials. If time permits, students also plan the outline of the thesis. 1 cr.

799. Senior Thesis
Part of a two-course capstone experience for the ECS major. Students work with their advisers and peers to formulate their topic and write a major research paper, between 25 and 50 pages long, on a topic related to European Cultural Studies. During the course of the semester, students meet regularly with their adviser to discuss the outline and rough draft of the thesis, and to go over revisions to the paper. The course culminates in the defense of the thesis before a committee of three ECS faculty members. If student schedules permit, we also hold meetings of all seniors who are currently writing an ECS thesis so that students may exchange ideas and offer peer feedback to each other. Pre- or Coreq: ECS 798. Writing intensive. 3 to 4 cr.

**Family Studies (FS)**

(For program description, see page 73.)

444. We Don’t All Play the Violin: Stories and Stereotypes of Asians in America
An interdisciplinary course that examines perceptions of difference and foreign culture through and exploration of the process of emigration of Chinese, Japanese, Cambodian, and Vietnamese families from Asia to America and their experiences here. Class considers history, economics, state and national legislation and regulations, policies, art, gender and generational differences, and family relationships, as well as North American reactions to the presence of Asians, how stereotypes by both Asians and Americans were developed, and their impact on family members. Writing intensive. 4 cr.

525/525H. Human Development
Developmental information from conception through death; theoretical perspectives and research methods in human development; emphasis on student's communication and analytical skills. 4 cr.

545. Family Relations
Theories and research relating to the family and its role in individual development. 4 cr.

553. Personal and Family Finance for Family Life Professionals
Applied financial management emphasizing teaching financial issues to a variety of audiences. Topics include savings, credit, insurance and retirement, and programs and resources available to facilitate financial education. 4 cr.

623. Developmental Perspectives on Infancy and Early Childhood
Integrative view of the developing child from conception through childhood within the family context. Prereq: FS 525. 4 cr.

624. Developmental Perspectives on Adolescence and Early Adulthood
Developmental information from pubescence through early adulthood; the concept of identity and influences on identity formation. 4 cr.

635. Teaching and Learning in Early Childhood Settings
Current theoretical approaches to communicating with children and influencing their behavior. Weekly four-hour laboratory experience working with preschool children is required at UNH Child and Family Center. Weekly three-hour seminar. Prereq: FS 525; FS 623; permission. Special fee. 4 cr.

641. Parenting Across the Life Span
Examination of parent-child relations across a range of developmental time periods and situations. Explores issues affecting parent-child relationships. Prereq: FS 525, 545, permission. 4 cr.

653. Family Economics
Exploration of family economics and well-being; public policy and family structure influences on the economic well-being of families. Prereq: FS 545. Writing intensive. 4 cr.

695. Independent Study
Scholarly project in the area of child, family, and consumer studies. Regular conferences with supervising faculty required. Prereq: approval of departmental faculty. 1 to 6 cr.

697. Special Topics
Focused examination of a particular theoretical, methodological, or policy issue. May be repeated. Prereq: permission. Writing intensive. 1 to 6 cr.

707. Practicum
Supervised in-depth experience in teaching, research, or advocacy in a professional setting to increase the student's understanding of children, families, or consumer issues. A) Child, B) Family, C) Consumer Studies. Prereq: FS major; permission. Cr/F. 1 to 6 cr.

708. Nursery Program Internship
Supervised internship in the UNH Child Study and Development Center part-time nursery programs with children 2-5 years of age. 1) 2-3-year-olds Intern, 2) Preschool Intern. In the role of Assistant Teacher, weekly three hours per credit on site engaged in planning, documentation, teaching, and assessment. For section 1) 2-3-year-olds intern, must be taken concurrently with FS 709A. Child Development Internship Seminar (1cr) unless completed previously. Prereq: FS 525; FS 623; FS 635; and permission. Materials fee. Cr/F. May be repeated up to a total of 8 credits. Special fee. 3 to 6 cr.

709. Advanced Child Development Practicum
Supervised positions within the UNH Child Study and Development Center child care programs: A) videotape assistant, B) assessment assistant, C) infant assistant, D) toddler assistant, E) assistant for three- to five-year-olds, F) kindergarten assistant, G) health issues assistant. May be repeated up to a total of 8 credits. Prereq: FS 525; 623; 635; or permission. Special fee. Cr/F. 1 to 6 cr.

709A. Child Development Internship Seminar
On-site weekly one hour seminar for in-depth reflection and analysis of internship experience with young children at the UNH Child Study and Development Center. Reading and projects required. Must be taken concurrently with either FS 708 or FS 709B internships. Cr/F; may be repeated up to a total of 2 credits. Special fee. 1 cr.

709B. Child Development Internship
Supervised internship in the UNH Child Study and Development Center full-day programs with children infancy-6 years of age: 1) infant/toddler intern, 2) preschool intern and 3) kindergarten intern. Weekly three hours per credit on-site engaged in planning, documentation, teaching, and assessment. Must be taken concurrently with FS 709A. Child Development Internship Seminar (1 cr) unless completed previously. Prereq: FS 525; FS 623; FS 635; and permission. Materials fee. Cr/F; may be repeated up to a total of 8 credits. Special fee. 3 to 6 cr.

710. Community Internship
Supervised position in community early childhood settings. A) infant/toddler assistant; B) preschool-child care assistant; C) kindergarten assistant; D) child life. May be repeated up to a total of 8 credits. Prereq: permission. Cr/F. 1 to 12 cr.

712. Child Advocacy and Family Policy Internship
Supervised experience working in state, federal, international, or state-wide advocacy organization or agency that advocates for children and/or families. Students spend a required number of hours per week in their selected program, based on the number of credit hours. (Spring semester, possibly Summer). Prereq: FS major; senior status; FS 525; 545; 28 credit hours of family studies coursework; permission. Coreq: FS 714. May be taken for 4 to 8 credits. Cr/F. 4 to 8 cr.

714. Seminar for Child Advocacy and Family Policy Interns
This biweekly seminar focuses on issues of concern to child advocacy and family policy internship students, and develops students' professional skills. Prereq: FS major; senior status; permission. Coreq: FS 712. (Spring semester; possibly Summer.) 2 cr.

733. Supervising Programs for Young Children
Philosophical bases and theoretical rationales of various programs for young children; program alternatives and resources; issues in administration including supervision, finances, and regulations. Prereq: permission. (Fall semester only.) Writing intensive. 4 cr.

734. Curriculum for Young Children
Designing and implementing developmentally appropriate activities for young children; assessing the effectiveness of activities; evaluating materials and equipment. Prereq: FS 525; 623; 635. (Spring semester only.) Writing intensive. 4 cr.

743. Families, Schools, and Community
Emphasizes the critical value of effective family-school-community partnerships in enhancing the education of young children. The literature assessing the interactive nature of parent and school resources with cultural influences is examined. Current models of family-school-community partnerships are explored. Students participate in parent/school/community activities within early childhood education centers and schools. Prereq: permission. Writing intensive. 4 cr.

746. Human Sexuality
Investigation of physiological, psychological, and social aspects of human sexuality. Particular attention to various social practices, policies, and programs that affect sexual attitudes and behaviors. 4 cr.
750. Contemporary Issues in Adolescent Development  
Focuses on contemporary adolescents and their developments within the context of families, schools, and the larger community. The course familiarizes students with major theoretical perspectives regarding adolescent development and provides an overview of current research on critical issues facing adolescents, their parents, and professionals who work with adolescents. Problems and risks will be addressed, but the major emphasis will be on maximizing strengths and opportunities. 4 cr.

757. Race, Class, Gender, and Families  
Explores the intersection of race, class, and gender in family life in the U.S. Theory, research, and other relevant literature is used to examine the variety of family configurations in our society today and the diverse experiences that families have as a result of existing social, political, and economic institutions. The strengths of various family types are considered, as well as the particular challenges these families may encounter in contemporary society. Prereq: seniors or graduate students only; permission. Writing intensive. 4 cr.

760. Family Programs and Policies  
Analyzes the connection between family support programs and family policy. Stresses program planning, implementation, and evaluation. Examines the research, theory, history, and current status of model family programs. Prereq: FS 545; permission. Writing intensive. 4 cr.

771. Observation and Assessment of Young Children  
Comprehensive view of various observation techniques for determining children's strengths and emerging skills. Exploration of issues regarding the use of formal assessments and testing with young children, retention and transitional placements, and the parent's role in testing. Prereq: FS 525; FS 545; 623; 635; 733; 734; 743; EDUC 706; KIN 675; MATH 601; THDA 520; permission. Coreq: FS 785-786. (Spring semester only.) Special fee. Cr/F. 8 cr.

792. Family Internship Seminar  
This biweekly seminar focuses on issues of concern to family internships, provides advanced training in educational strategies for working with families, and develops students' professional skills. This is a two-semester course with 2 credits being taken each semester. Prereq: FS major; admission to family internship program; permission. Coreq: FS 782. (Fall and spring semester.) IA (continuous grading). Writing intensive. 2 cr.

794. Families and the Law  
Exploration of laws affecting families and the interaction of family members with each other and with society. Prereq: FS 545. Writing intensive. 4 cr.

797. Advanced Special Topics  
Highly focused examination of a particular theoretical, methodological, or policy issue. Prereq: permission. Writing intensive. 1 to 6 cr.

799. Honors Senior Thesis  
Under direction of a faculty sponsor, students plan and carry out an independent investigative effort in an area of family, child, and/or consumer studies, resulting in a written thesis and an oral presentation before students and faculty. Prereq: majors only; senior standing; permission. Two-semester sequence as continuing course. 2 to 4 cr.

776. Children, Adolescents and the Law  
This course is designed to familiarize students with the specialized laws and adjudicative systems that govern children, adolescents, and families and reflect society's effort to balance competing interests and goals. It provides the chance to explore laws and processes that affect children and adolescents as they interact with their caregivers, families and society at large. Prereq: FS 525; 545 and FS 623 or 624; permission of instructor. 4 cr.

822. Family Internship  
Supervised experience working in social, legal, and marketplace settings that offer services to families. Students spend a minimum of 15 hours per week in a selected community program. Admission by application only. Applications due prior to registration spring semester of the junior year. A senior-level course with 6 credits being taken each semester. Prereq: FS major; senior status; FS 525; 545; 20 credit hours of family studies course work; permission. Pre- or Coreq: FS 760. Coreq: FS 792. IA (continuous grading). Coreq: 6 cr.

785, 786. Seminar for Student Teachers  
Supplements the student teaching experience and effects a transition to the profession of teaching for those students admitted to the early childhood certification option. 2 cr.

788. Student Teaching Young Children  
Supervised teaching experience. Students spend a minimum of 20 hours per week in a selected program for young children working with a cooperating teacher. Students must apply during the fall semester of their senior year. Prereq: FS 525; 545; 623; 635; 733; 734; 743; EDUC 706; KIN 675; MATH 601; THDA 520; permission. Coreq: FS 785 786. (Spring semester only.) Special fee. Cr/F. 8 cr.

794. Families and the Law  
Exploration of laws affecting families and the interaction of family members with each other and with society. Prereq: FS 545. Writing intensive. 4 cr.

797. Advanced Special Topics  
Highly focused examination of a particular theoretical, methodological, or policy issue. Prereq: permission. Writing intensive. 1 to 6 cr.

799. Honors Senior Thesis  
Under direction of a faculty sponsor, students plan and carry out an independent investigative effort in an area of family, child, and/or consumer studies, resulting in a written thesis and an oral presentation before students and faculty. Prereq: majors only; senior standing; permission. Two-semester sequence as continuing course. 2 to 4 cr.

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822. Family Internship  
Supervised experience working in social, legal, and marketplace settings that offer services to families. Students spend a minimum of 15 hours per week in a selected community program. Admission by application only. Applications due prior to registration spring semester of the junior year. A senior-level course with 6 credits being taken each semester. Prereq: FS major; senior status; FS 525; 545; 20 credit hours of family studies course work; permission. Pre- or Coreq: FS 760. Coreq: FS 792. IA (continuous grading). Coreq: 6 cr.

785, 786. Seminar for Student Teachers  
Supplements the student teaching experience and effects a transition to the profession of teaching for those students admitted to the early childhood certification option. 2 cr.

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Supervised teaching experience. Students spend a minimum of 20 hours per week in a selected program for young children working with a cooperating teacher. Students must apply during the fall semester of their senior year. Prereq: FS 525; 545; 623; 635; 733; 734; 743; EDUC 706; KIN 675; MATH 601; THDA 520; permission. Coreq: FS 785 786. (Spring semester only.) Special fee. Cr/F. 8 cr.

794. Families and the Law  
Exploration of laws affecting families and the interaction of family members with each other and with society. Prereq: FS 545. Writing intensive. 4 cr.

797. Advanced Special Topics  
Highly focused examination of a particular theoretical, methodological, or policy issue. Prereq: permission. Writing intensive. 1 to 6 cr.

799. Honors Senior Thesis  
Under direction of a faculty sponsor, students plan and carry out an independent investigative effort in an area of family, child, and/or consumer studies, resulting in a written thesis and an oral presentation before students and faculty. Prereq: majors only; senior standing; permission. Two-semester sequence as continuing course. 2 to 4 cr.

FREN 503 with a grade of B- or better. Students may take one language course (equivalent to FREN 401-402) and have two or more years of high school French. Special fee. FREN 403 does not satisfy the foreign language requirement. 4 cr.

425. Introduction to French Studies  
Taught in French. Designed for students interested in exploring the history, literature, and culture of France and other French-speaking countries. Learning by means of guest speakers, and multimedia. Prepares for FREN 401-402. Does not satisfy B.A. foreign language requirement, but does satisfy the general education requirement(s) for foreign culture and counts toward the French Studies minor. Special fee. (Offered spring semesters and occasional summer semesters.) Writing intensive. 4 cr.

426. Introduction to Francophone Studies  
Taught in English. Explores the history, literature, and cultures of francophone countries in Europe, Africa, North America, or the Caribbean. Lecture, discussion, guest speakers, and multimedia. Satisfies the general education requirement for foreign culture and counts toward the French Studies minor. Francophone regions will vary from year to year. Special fee. Writing intensive. 4 cr.

500. Selected Topics in World Literature  
Topics will be chosen that introduce students to major themes and genres. (Also offered as CLAS 500, GERM 500, ITAL 500, PORT 500, RUSS 500, SPAN 500.) May be repeated for credit. Cr/F. Writing intensive. 4 cr.

503/503H, 504/504H. Intermediate French  
Conducted in French. Review of grammar with emphasis on the development of reading, writing, speaking, and listening skills, and on culture. Discussion in French of literary and cultural readings. Labs and films. Special fee. Writing intensive. 4 cr.

522. French Drama in Translation  
Taught in English, major works of comedy, tragedy, and drama. Molliere and Racine to the present day. Not for major credit. Special fee. (Not offered every year.) 4 cr.

525. Introduction to French Civilization and Culture  
Taught in English. French civilization from a variety of perspectives and topics. Includes historical, geographical, and artistic expressions of French culture. Not for major credit. May be repeated for credit barring duplication of materials. Special fee. (Not offered every year.) Writing intensive. 4 cr.

526. Introduction to Francophone Cultures  
Taught in English. Focus on French-speaking cultures other than France. Includes historical, geographical, and artistic expressions of these cultures. Not for major credit. May be repeated for credit barring duplication of materials. Special fee. (Not offered every year.) Writing intensive. 4 cr.

527. Francophone Cinema  
Introduction to major francophone film texts. Through cinema, the course explores the cultures, societies, histories, and politics of francophone countries in Europe, Africa, North America, and the Caribbean. Students examine filmmakers, genres, periods, and movements. Lecture, discussion, and guest speakers. Francophone region varies from year to year. Taught in English. Special fee. 4 cr.

582. Study Abroad in Paris  
Study with the University of Delaware program in Paris, France. For students who have completed FREN 503 with a grade of B- or better. Students take one language course (equivalent to FREN 401-
503 or 504) and courses taught in English (topics include Art History, History, Literature, and Political Science). Special fee. Prereq: FREN 501 or FREN 503. Cr/F. 1 to 16 cr.

585. Intermediate Language Study in France Equivalent to FREN 403, requires four weeks of intensive study of French language and culture at the Centre International d’Etudes des Langues (CIEL) in Brest, France. Prereq: FREN 501 or French 4 in a U.S. high school, with a grade of C+ or better and permission. Special UNH administrative fee and DCE registration fee. Student responsible for personal and travel expenses, and tuition costs in France. Special fee. (Offered summers only.) 4 cr.

586. Intermediate Language Study in France Equivalent to FREN 504, requires four weeks of intensive study of French language and culture at the Centre International d’Etudes des Langues (CIEL) in Brest, France. Prereq: FREN 503 or French 4 with a grade of C+ or better and permission. Special UNH administrative fee and DCE registration fee. Student responsible for personal and travel expenses and tuition costs in France. Special fee. (Offered summers only.) 4 cr.

590. Seminar in French Language and Literature Individual guided study of the work of a major author, genre, or specific topics in literature. Training in bibliography and organization of material. Prereq: permission. (Not offered every year.) 1 to 4 cr.

593. Honors Senior Thesis Yearlong course leading to an honors senior thesis. Open to French majors who individually designed research projects have been approved by the department honors committee and who have been assigned an adviser. Students must enroll for both fall and spring semesters. Students defend the resulting written thesis in an oral presentation before department members and others. Prereq: permission. 2 cr.

705. Population Genetics An exploration of the forces affecting the frequency and distribution of allelic variation in natural populations. The relative role of mutation, selection, random drift and inbreeding and structuring genetic variation. Quantification of the genetic structure of populations. Prereq: BIOL 604. (Also offered as ZOOL 705.) Special fee. Lab. (Not offered every year.) 4 cr.

711. Genomics and Bioinformatics The methods, applications, and implications of genomics—the analysis of whole genomes. Microbial, plant and animal genomics are addressed, as well as medical, ethical and legal implications. The lab provides exposure and experience on a range of bioinformatics approaches—the computer applications used in genome analysis. Prereq: BIOL 604. (Also offered as ANSC 706.) 3 cr.

712. Molecular Evolution Rates and patterns of evolutionary change in biomolecules. Forces affecting the size and structure of genomes. Molecular mechanisms of organismal evolution. Emphasizes integrating evidence from biochemistry, molecular genetics and organismal methods. Prereq: BIOL 604. Some knowledge of statistics is recommended. Lab. (Also offered as ZOOL 712.) Special fee. Lab. (Not offered every year.) 4 cr.

723. Quantitative Genetics Analysis of continuous variation in populations simultaneously segregating at multiple loci. Genetic and nongenetic factors and the complex interactions between them. Models and methods of analysis, for both theoretical and practical applications.
Prereq: BIOL 604; BIOL 528 strongly suggested. (Also offered ZOOL 723.) Special fee. Lab. (Not offered every year.) 4 cr.

753. Cytogenetics
Chromosome structure, function, and evolution. Eukaryotic genome organization. Theory of, and laboratory techniques for, cytogenetic analysis in plants and animals. Prereq: BIOL 604. Special fee. Lab. (Also offered as PBIO 753. Not offered every year.) 4 cr.

754. Laboratory in Biochemistry and Molecular Biology of Nucleic Acids
Application of modern techniques to the analysis of biomolecules, with an emphasis on nucleic acids; includes DNA isolation and analysis, cloning, sequencing, and analysis of gene products. No credit if credit has been received for MICRO 704. Prereq: BCHM 658/659, 751, or permission. (Also offered as BCHM 754 and PBIO 754.) Special fee. Not offered every year. Writing intensive. 5 cr.

766. Environmental Genomics
The field of environmental genomics uses existing and developing high throughput genomic-scale technologies to investigate ecological and evolutionary theory, and so provides a more complete understanding of how organisms respond to level. Course covers an array of systems involved in this emerging field, with the central aim of understanding the effects of environmental change on genome structure, gene expression, and adaptive evolutionary change. Information is derived from the primary literature in the field and covers practical and technical concepts as well as the underlying theoretical basis for the major research themes. Prereq: BIOL 604. (Also offered as BCHM 766.) 4 cr.

771. Molecular Genetics
Structure, organization, replication, dynamics, and expression of genetic information in eukaryotes. Focus on molecular genetic mechanisms of gene expression and its control; molecular genetics methods; molecular genetic control of cell division and differentiation during development. Prereq: BCHM 658 or 751; BIOL 604/ or permission. (Also offered as BCHM 771.) 4 cr.

772. Evolutionary Genetics of Plants
Mechanisms of genetic change in plant evolution, domestication, breeding, and genetic engineering. Topics include Darwinian theory; speciation and hybridization; origins and co-evolution of nuclear and organelle genomes; gene and genome evolution; transposable elements, chromosome rearrangements, polyploidy. Lab. DNA techniques, sequence analysis programs, phylogenetic trees. Special fee. Prereq: BIOL 604 or equivalent; PBIO 412 or BIOL 411/412 or equivalent. (Also offered as PBIO 772.) 4 cr.

774. Plant Biotechnology and Genetic Engineering
Plant transformation and regeneration, gene isolation and identification, structure and regulation of plant genes, current applications of plant genetic engineering, environmental and social implications. Prereq: BIOL 604 or permission. (Also offered as PBIO 774.) 3 cr.

775. Plant Biotechnology and Genetic Engineering Lab
Techniques for genetic transformation and selection of plants, analysis of foreign gene expression, and plant cell and tissue culture. Coreq: PBIO or GEN 774. (Also offered as PBIO 775.) Special fee. (Not offered every year.) 2 cr.

#782. Developmental Genetics
The molecular genetic basis of metazoan development. Focuses on how genes direct the process and how this problem is analyzed in model organisms using molecular genetic approaches. Topics include control of cell division, maternal factors, cell-cell interactions, and differential gene expression. Prereq: BIOL 604; BCHM 658 or 751. (Also offered as BCHM 782. Not offered every year.) 3 cr.

795/795W. Investigations
Independent study/research in various areas of genetics. A) Transmission Genetics, B) Molecular Genetics, C) Population and Quantitative Genetics. Prereq: permission. May be repeated to a maximum of 4 credits. 1 to 4 cr.

Geography (GEOG)
(For program description, see page 36.)

401/401H. Regional Geography of the Western World
Major culture areas of the Western world and the unique interaction of human and physical phenomena that produces the distinctive character of these areas. Emphasizes the manner in which people of different cultures have made use of the opportunities and solved the problems existing in the major regions occupied by Western culture: Europe, Russia, the Americas, and Australia and New Zealand. 4 cr.

402/402H. Regional Geography of the Non-Western World
Major culture areas of the non-Western world and the unique interaction of human and physical phenomenon that produces the distinctive character of these areas. Emphasizes the manner in which people of different cultures have made use of the opportunities and solved the problems existing in the major regions occupied by non-Western cultures: the Middle East and North Africa, Africa south of the Sahara, Oriental Asia and the Pacific Islands. 4 cr.

473. Elements of Weather
Basic principles of weather phenomena and the physical processes underlying these phenomena. Emphasis on weather patterns of New England. Lab. 4 cr.

514. Geography of the United States and Canada
Historical and regional geography of Canada and the U.S. Geographical diversity of the two countries; the development of distinctive culture regions; physical setting, resource base, settlement, population growth, economic development. Contempory issues and problems. The particular relationship between the two countries. 4 cr.

540. Geography of the Middle East
Environmental, cultural, political-geographic, and ecological foundations of the Middle East. Selected regional problems and issues, e.g., geographical dimensions of the Arab-Israeli conflict, oil, urbanization, population growth, and nomadism. (Not offered every year.) 4 cr.

541. Geography of Japan
Examination of Japan's environmental setting, historical geographic evolution, distinctive cultural geographic patterns, population and settlement characteristics, internal spatial differentiation, economic growth, political geographic structure, and global importance. (Not offered every year.) Writing intensive. 4 cr.

570. Climatology
General survey of climate classification and the geographical distribution of climate types, interpretation and applications of climate data, climate change over geologic time, and issues of global warming. (Not offered every year.) Prereq: GEOG 473 or ESCI 405. 4 cr.

572. Physical Geography
Basic principles underlying the study of landforms. Emphasis is placed on their spatial distribution and the processes that shape the landscape. Special fee. (Not offered every year.) 4 cr.

573. Biogeography
Explores the introductory concepts of plant geography and biogeography, two interconnected disciplines that document and explain the changing distributions of plants and animals from both a spatial and temporal context. Gives equal emphasis to ecology (biomes, climates, soils, evolution (migration and adaption)), and applied biogeography and plant geography. 4 cr.

581. Human Geography
Differentiation of the world in terms of population, race, language, religion, political territory, and economic life. Collection and critical use of empirical data; emphasis on spatial and ecological analysis. 4 cr.

582. Economic Geography
Investigates the manner in which resources and space have been organized for the production of goods and services: agriculture, the extractive industries, manufacturing, and the tertiary sector. Empirical studies, theories of location, and location models. Major contemporary problems and issues in agriculture and food supply, energy sources, industrial readjustment, and the global economy. (Not offered every year.) Writing intensive. 4 cr.

583. Urban Geography
Spatial structure of cities and the city system. Emphasizes the North American city and its problems of use, disinvestment, political fragmentation, physical environment, and residential patterns. Trends in urbanization in the developed and developing worlds. Global cities. (Not offered every year.) 4 cr.

584. Political Geography
Interactions between geographic and political phenomena at the sub-national, national, and international levels. Emphasis on geographical aspects of current political problems within and between states. (Not offered every year.) Writing intensive. 4 cr.

586. Historical Geography of North America
An introduction to major themes, important scholars, and commonly used research techniques in historical geography. Course is reading and research oriented. Focus will be on North America. (Also listed as HIST 512.) Writing intensive. 4 cr.

587. Place and Popular Culture
Explores the role geography plays in popular culture—such as in literature, motion pictures, television, music, the news media, and advertising—and the ways in which popular culture shapes people's perceptions about places. Writing intensive. 4 cr.

#610. Geography of New England
The distinctive physical setting of New England, its settlement and development during the past three centuries, and the present-day problems and opportunities of the region. One Saturday field excursion near end of term. Special fee. (Not offered every year.) 4 cr.
658. Introduction to Geographic Information Systems
An introduction to the use of geographic information systems (GIS) for natural resources and related fields. Data models/structures, map projections, data input/output/storage, data analysis/modeling, interpolation, and data quality standards. Hands-on using ArcView 3.x GIS software. Permission. (Also offered as NR 658.) 4 cr.

673. Environmental Geography
Survey of the interactions between humans and earth's physical environments. Attention focused on the geographical distribution of environmental problems. Topics include resource utilization, economic factors, population growth, food supplies, and air and water pollution. (Not offered every year.) Writing intensive. 4 cr.

685. Geography of Population and Development
A regional approach to the study of population geography with concern for the interaction between the focus of economic growth and the components of population change and development. Considers the environmental impact of developing trends in the developed and developing worlds and the relationship of these trends to sustainable growth and population patterns. Writing intensive. 4 cr.

686. World Economy and Globalization
Emphasizes the spatial development of the world economy and the evolution into today's "globalized" economy. Topical emphasis includes the processes of global economic production changes, the role of transnational corporations, and the role of the state in globalization. 4 cr.

757. Photo Interpretation and Photogrammetry
Practical and conceptual presentation of techniques for using remote sensing, specifically aerial photographs, in natural resources. Includes photo measures of scale, area, parallax and object heights; flight planning; photo geometry; an introduction to the electromagnetic spectrum; and photo interpretation and mapping. Concludes with an introduction to digital remote sensing including multispectral scanners, radar, and thermal imagery and a large discussion of geographic information systems (GIS). Applications to forestry, wildlife, land-use planning, earth sciences, soils, hydrology, and engineering. Prereq: algebra. Special fee. Lab. (Also listed as NR 757.) 4 cr.

759. Digital Image Processing for Natural Resources
Introduction to digital remote sensing, including multispectral scanners (Landsat and SPOT), radar, and thermal imagery. Hands-on image processing including filtering, image display, ratios, classification, registration, and accuracy assessment. GIS as it applies to image processing. Discussion of practical applications. Use of ERDAS image-processing software. Knowledge of PCs required. Prereq: GEOG 757 or equivalent and permission. (Also offered as NR 759.) 4 cr.

760. Geographic Information Systems in Natural Resources
Introduces the use of geographic information systems (GIS) for use with natural resources including data input, manipulation, storage, analysis, and display. Accuracy of spatial data and use of digital elevation models. Discussion of practical applications. Use of PC Arc/Info software. Prereq: permission. Lab. (Also listed as NR 760.) 4 cr.

795. Special Project
Readings, library, archival, and fieldwork. Primarily for geography seniors. Prereq: permission. Writing intensive. 2 or 4 cr.

796. Special Topics

797. Seminar
Exploration of geography as a research discipline. Definition and investigation of research problems. Primarily for geography seniors. 2 cr.

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German (GERM)

(For program description, see page 41.)

401-402. Elementary German
For students without previous training in German. Aural comprehension, speaking, writing, reading, language labs. No credit for those with two or more years of German in secondary school. Special fee. 4 cr.

500. Selected Topics in World Literature
Topics are chosen to introduce students to major themes and genres. (Also offered as CLAS 500, FREN 500, ITAL 500, PORT 500, RUSS 500, SPAN 500.) May be repeated for credit. Credit/Fail. Writing intensive. 4 cr.

503-504. Intermediate German
Review of grammar; practice in oral and written expression; readings and cultural material. Prereq: GERM 401-402 or equivalent. Labs. Special fee. 4 cr.

#521. Major German Authors in English
Selected masterpieces of the 18th, 19th, and 20th centuries by authors such as Goethe, Mann, Kafka, Hesse, Bachmann, Koeppen, Brecht, Frisch, Wolf, and Durrenmatt. Readings and discussions in English. May be taken for major credit. Special fee. 4 cr.

#523. Women and German Film
Acquaints students with major German film texts. Asks gender-specific questions about German film history; male and female film makers, the construction of sexuality through film images and narrative, and the impact of feminism. In English. Special fee. 4 cr.

524/524H. Special Topics in German Film
Using analytical and critical tools, students read film texts as aesthetic works (with a form and a narrative) and as historical works (with a social function). Culminates in an investigation of a distinct historical period of German film or of a particular theme through the history of German film. Special fee. 4 cr.

525/525H. Introduction to German Culture and Civilization
Aspects of the political, social, and cultural life of Germany, Austria, and Switzerland. Conducted in English. Required of German majors; strongly recommended for any students planning study abroad in a German-speaking country. Special fee. 4 cr.

585. Rosenheim Summer Program: A Review of German
Provides an intensive, three-week review of the basic vocabulary and grammatical structures of the German language. While the reading, listening and writing skills will be practiced, this course emphasizes the speaking of the language in everyday, real-life situations. Conducted during the summer in Rosenheim, Germany. Special fee. Prereq: one year of college, elementary German or equivalent; permission. 4 cr.

595. Internship
The German Internship consists of unpaid placement in an approved business, social service or educational organization in a German-speaking context with on-site supervision. Student is responsible for keeping a journal to be evaluated by a UNH faculty mentor. Site supervisor evaluates intern's work on location in consultation with UNH mentor. Prereq: GERM 504. Variable credit 2 to 4 credits per unit. May count up to 4 credits toward German major or minor and an additional 4 as graduation elective. Does not replace Study Abroad requirement for major. Special fee. 2 to 4 cr.

601. Introduction to German Literature
Reading and analysis of poems, dramas, and short prose; introduction to theory of literary forms and methods of analysis. Required of all German majors; must be taken as soon as possible after GERM 504. Prereq: knowledge of German. Special fee. 4 cr.

630/630H. German Narrative Forms
Textual studies based on works from one of the following prose genres: novel; novella; autobiography; fairy tale; short prose (short story, parable, documentary prose, feuilleton). Focuses on the nature and characteristics of the genre, thematic and stylistic features of each text, and the diverse cultural, political, gender, or national perspectives that generate these forms. Special fee. 4 cr.

631/631H/631W. Advanced Communications Skills I
Intensive practice in vocabulary building and developing a sense of appropriate style for various contexts of oral and written communication. Special emphasis on conversational and expository speaking. Discussion of topics of current interest, oral reports, role play, and simulation of everyday situations, reinforced by written work. Required. Special fee. 2 to 4 cr.

632. Advanced Communications Skills II
Intensive practice in vocabulary building and coherent expression in a variety of stylistic contexts. Special emphasis on writing skills, from expository prose to letter and resume writing, essays, journalistic reports, and creative writing, focusing on topics of current interest. Required for the German major. Special fee. Prereq: GERM 504. 4 cr.

640. German Drama
Selected masterpieces of the German theatre from the 18th century to the present, including reception and performance history. Course may vary in emphasis from classical German tragedy and comedy to more modern forms such as didactic and documentary plays, tragicomedies, and farce. Special fee. Writing intensive. 4 cr.

645/645H. Contemporary German Literature
Literary trends in the German-speaking countries since 1945. Analysis and interpretation of works by major authors. Special fee. Writing intensive. 4 cr.

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Geography, German
Gerontology (GERO)

(For program description, see page 111.)

#600. Introduction to Gerontology
Introduction to the study of normal aging and to the applied practice of service to the elderly. Primarily for minors but open to other students. Writing intensive. 4 cr.

795. Independent Study
Practical experience with elderly populations under supervision of designated faculty. 4 cr.

Greek (GREK)

(For program description, see page 41.)

401-402. Elementary Classical Greek
Grammar, simple composition, and translation. For students without previous training in Greek. Special fee. 4 cr.

403-404. Elementary Modern Greek
Aural-oral practice and the study of fundamental speech patterns, reading, and writing to achieve a firm basis for an active command of the language. (No credit for students who have had two or more years of modern Greek in secondary school.) Special fee. 4 cr.

503-504. Intermediate Classical Greek

505-506. Intermediate Modern Greek
Short selections from modern Greek literature with grammar review and oral practice. Readings from such authors as Solomos, Cavafy, Palamas, Kazantzakis, Venezis, Myrivilis, Seferes, and Elysies. Prereq: GREK 404 or equivalent. Special fee. 4 cr.

589, 596. Directed Reading in Greek
Independent study of a classical, Byzantine, or modern Greek author. May be repeated. Prereq: GREK 503-506, or equivalent. Special fee. 2 to 4 cr.

#631, #632. Greek Prose Composition
Review of Attic Greek grammar, study of Greek prose style, English to Greek translation. Prereq: permission. Special fee. 4 cr.

635-636. Third-Year Modern Greek
Rapid review of basic grammatical structures and in-depth study of more complex linguistic patterns. Vocabulary building. Frequent compositions and oral presentations using materials on contemporary culture and literary texts as well as various media. Students develop oral/aural skills in lab and class. Prereq: GREK 505-506; or 595-596 (if approved) with a grade of C or better. Special fee. 4 cr.

751, #752. Homer and the Archaic Period
Readings from the Iliad, the Odyssey, the Homeric hymns, Hesiod, Pindar, and the lyric poets. Prereq: permission. Special fee. 4 cr.

753, 754. Advanced Study in Athenian Literature

775. 781. Independent Study
Open to qualified juniors and seniors. Not to be elected except with the permission of the department chairperson and of the supervising faculty member or members. Barring duplication of subject, may be repeated for credit. Special fee. 1 to 4 cr.

797. Special Studies in German Language and Literature
Selected topics in language, culture, and literature. 2 or 4 cr.

798. Special Studies in German Language and Literature
Selected topics in language, culture, and literature. Special fee. 2 or 4 cr.

Health & Human Services

(For program description, see page 72.)

444. The Right to be Disabled in the Extreme Makeover Society
Explores how society’s view of disability, its “construction,” is influenced by a variety of cultural variables and the implications of that construction on institutions such as medicine and health care, education, the arts, the legal system, architecture and engineering, etc. 4 cr.

Examines the process of human birth focusing on the emergent technologies of human genetics, assisted fertility technologies, prenatal diagnosis and treatment, as well as the appropriate and inappropriate use of technology through the labor, delivery, and post-partum experience. The social, cultural, political and historical context for the development and application of these technologies is explored. 4 cr.

#510. AIDS: Health, Ethics, and Social Agenda
AIDS has become one of the most important health issues of our time. This course explores the medical, policy, financial, and ethical issues raised by society’s efforts to respond to this “crisis.” Writing intensive. 4 cr.

540. Statistics for Health and Human Service Professionals
Conceptual and analytical approach to the use of statistics in the health and human service professions. Emphasizes the logic and purpose of statistics. Attention to special problems of statistical design such as random assignment, single subject trials, and the ethics of control groups. Basic computer skills for manipulating data. No credit for students who have completed ADM 430; BIOL 528; ADMN 420; EREC 525; MATH 639, 644; PSYC 402; SOC 502. Special fee. 4 cr.

698. Special Topics

740. Collaborative Services for Children with Special Needs
Teachers and therapists need to collaborate to provide quality services for children and youth when working in a school setting. Designed for students in any professional area who plan to work with children, this course focuses on team development to plan integrated education and related services for children with a variety of special needs including autism/PDD, ADHD, learning disability, cerebral palsy, speech and language disorders, and multiple disabilities. Students will learn team development skills, how to collaborate with other professionals to write an IEP and provide services, and how to address needs frequently seen in common pediatric conditions. Prereq: junior level or above. 4 cr.

798. Special Topics
Explores areas related to specific professional health interests. May repeat but not duplicate subject areas. A) Communication Disorders, B) Health...

Health Management & Policy (HMP)

(For program description, see page 75.)

400. Exploring Health: Doing Well by Doing Good
Acquaints students with the administrative roles, functions, settings, and professional expectations of health management professionals. Provides an overview of health care organizations and services. Students visit selected health care organizations and talk with professionals. 2 cr.

401/401H/401W. United States Health Care Systems
Nature and functions of health care services and health professionals; impact of social, political, economic, ethical, professional, legal, and technological forces on health care systems. Current health policy issues. 401W is writing intensive. 4 cr.

402. Health Management and Policy Critical Issues
The roles, functions, settings, and professional expectations of Health Management Professionals. Explores key topic areas of health management and policy, including financing the health care system, the public health system, and function, the political process, as well as current areas of interest. Prereq: HMP 401 major or permission. 4 cr.

430. Alternative Medicine and Health
An overview of several systems of medicine and health that employ a framework different from industrialized Western medicine for understanding the nature and causes of disease and approaches to treatment. To better understand the validity of legitimacy of alternative systems, we will also examine current research on the outcomes, effectiveness and efficacy of the various systems. 4 cr.

444. From Frankenstein to Dolly, and Beyond
This course is an interdisciplinary introductory course designed specifically for first year students. It seeks to stimulate and support student inquiry and exploration of social and ethical issues associated with scientific research and advances, the value-laden questions that they often precipitate, and their impact on individuals, population groups, and society at large. (Also listed as MCR 444.) 4 cr.

501/501H. Epidemiology and Community Medicine
The distribution and determinants of disease, illness, and health in the community. Community health and illness measures, health status, and source of data. Development of hypotheses and study designs to reduce community health problems using epidemiological reasoning, methods, and analyses. Lab. 4 cr.

505. Public Health: History and Practice
Blends a broad overview of the historical development of public health with important areas of contemporary public health practice. Traces the history and practices of public health from classical times, through the Middle Ages, the Renaissance, and European Enlightenment. Special emphasis on the historical evolution, development, and future of public health in the U.S. The latter includes the organization of public health in the U.S., its major functions and practices, its infrastructure, its programs and services, and its future challenges. 4 cr.

569. Human Behavior and the Public Health
Provides a grounding in fundamental concepts of the behavioral sciences as they illuminate public health. Individual and community responses to prevention, identification of symptoms, diagnoses, treatments, chronic ailments, and rehabilitation are discussed. In each of these areas, the course explores the interaction between community, family, patient, and health care provider. 4 cr.

570. Social Marketing
An introduction to the vocabulary and tools of social marketing. Expanding upon the traditional principles of marketing and consumer behavior, students are exposed to the challenges of trying to effect behavior change. Writing intensive. 4 cr.

600. Special Topics
A) Hospital Management, B) Long-term Care Management, C) Ambulatory Care Management, D) Clinical Services Management, E) Home Care Management, F) Mental Health Management, G-Z) Interdisciplinary. May repeat, but may not duplicate subject areas. Prereq: junior major or permission. Special fee on some sections. 1 to 4 cr.

621. Pre-practicum Seminar
Preparation for field practicum experience, orientation to experiential learning and competency development. Prereq: major. 2 cr.

622A-C. Field Practicum
Experiential learning in a health care organization; application of theories to practice. Planned learning objectives are accomplished through three distinct components. Supervision by agency personnel. Prereq: junior major; permission. Cr/F. 622A, Field Practicum Organizational Analysis: analysis of assigned health care agency, from external and internal viewpoints. Coreq: 622B; 622C. Cr/F 622B, Field Practicum Management Skills Development: development of the basic quantitative and interpersonal skills required for a health services manager. Coreq: 622A; 622C. Cr/F 622C, Field Practicum Project Analysis: demonstration of knowledge and analysis of specific problem-solving skills required during internship. Coreq: 622A; 622B. Cr/F 1 cr.

624. Post Practicum Seminar
Summary and conclusion from field practicum experience. Individual analysis and panel discussions to include site assessment, project description and methodologies employed, critique of individual skills and knowledge base in relation to internship. 1 cr.

630. Health Issues Seminar I
Discussion of current issues in the field of health management, health policy and public health. Prereq: major or permission. 1 cr.

631. Health Issues Seminar II
Discussion of current issues in the fields of health management, health policy and public health. Prereq: major or permission. 1 cr.

642. Health Economics
Theoretical and empirical analysis of the U.S. health care delivery sector. Topics include health insurance markets and their effects on patients demand, uninsured populations and their access to health care services, breakdowns in the principal/agent relationship between patients and providers, competition in the medical sector, technology, pharmaceuticals and the scope and effect of government involvement in the delivery of health care. Prereq: ECON 402. (Also listed as ECON 642.) 4 cr.

702. Quantitative Methods in Epidemiology
Builds on previous material in epidemiology and statistics to develop quantitative skills in epidemiology. Includes measures of disease frequency, comparative measures of disease frequency, effects estimation and confidence intervals, contingency table analysis, logistic regression and survival analysis. Students identify appropriate uses for these methods, calculate them by hand using statistical software as appropriate, and interpret statistics. A data set is used for practice calculations and to produce a final project. Prereq: HMP 501. Special fee. 4 cr.

710. Financial Management for Clinicians
Basics of health care financial management and cost accounting. Includes cost concepts and product costing, budgeting, and variance analysis with emphasis at the departmental level. Contains basic accounting principles: use of ratio analysis to examine balance sheets and revenue and expense statements. Explores capital project analysis and health care reimbursement. Prereq: HMP 401 or equivalent; permission. 4 cr.

711. Health Systems Research I
Introduces intermediate techniques for data manipulation and analysis for the health care field. Also introduces methods for survey research and large data set manipulation and analysis. There is a lab section utilizing a statistical software package where students perform tasks from a large national data set. Prereq: introduction to statistics. 4 cr.

712. Health Systems Research II
Introduces students to decision science and applies decision making to health systems. Teaches the techniques of health care management, epidemiological analysis, and policy analysis as they relate to the decision making process. There is a lab section with applied exercises. Prereq: HMP 711. Lab. 4 cr.

721. Managing Health Care Organizations
Organizational characteristics of ambulatory, acute, long-term care facilities. Management issues and strategies involving governance, clinical services, human and fiscal resources, and community-based services. Prereq: major or permission. 4 cr.

723. Health Planning
Theoretical and historical foundations of health planning; the relationship of health planning and regulation; the application of planning methods; and the utilization of strategic planning and its relationships to marketing. Prereq: major or permission. Special fee. 4 cr.

734. Health Law
Concepts and principles of law as these affect medical and administrative decision making in health care institutions and the ability to discern issues that warrant advice and/or assistance of legal counsel. Topics include corporations and antitrust, property law, patients' rights under law, and malpractice. Prereq: major or permission. 4 cr.
740. Health Care Financial Management
Techniques, principles, and practices of managing fiscal aspects of health care organizations. Exploration of concepts and techniques associated with variance analysis, cost allocation, management of working capital, and capital decision analysis. Analysis of the impact of reimbursement on health care organizations. Lab. 4 cr.

742. Strategic Management for Health Care Organizations
Application of managerial methods involving financial, marketing, and operational analysis to health management. Case studies. Prerequisite: HMP 740. Lab. Special fee. 4 cr.

744. Ethical Issues in Health Management and Medicine
Ethical theories and decision-making models; patients' rights and professional responsibilities; social justice and resource allocation; critical issues facing clinicians, managers, and health policy makers; managerial versus medical care conflicts. Prerequisite: major or permission. Writing intensive. 4 cr.

746. Health Policy
Analysis of the public policy process, the development of health policies in the U.S., and discussion of specific health policy issues. Prerequisite: major or permission. 4 cr.

748. Health Policy Analysis
Public policy outputs analyzed for effectiveness, efficiency, and equity, focusing on public policies in the United States. Prerequisite: major or permission. Lab. Special fee. 4 cr.

#755. Long Term Care Management and Policy
Analyzes significant contemporary management and public policy issues associated with the aging population and the continuum of long-term care in the U.S. Emphasizes costs associated with and approaches to financing, accessibility, delivery, and quality of home-based, community-based, and institution-based health care services. Prerequisite: major or permission. 4 cr.

796. Independent Study
In-depth study with faculty supervision. Prerequisite: permission of major adviser and faculty in the area concerned. 2 to 4 cr.

798H. Honors Project/Research Design
Examines selected research designs and methods used in health services research/program evaluation. Establishes theoretical and methodological foundation for honors-in-major research project to be conducted during the subsequent semester under a faculty member's supervision. Prerequisite: senior honors-in-major status and permission. 2 cr.

799H. Honors Project/Research
In-depth research project (conducting and analyzing) under supervision of faculty member. Includes scholarly presentation of findings to faculty and other interested parties and preparation of manuscript suitable for publication in peer-reviewed journal. Prerequisite: HMP 798H and permission. Writing intensive. 4 cr.

History (HIST)

405/405H/405W. History of Early America
America from the early age of European discovery to the mid-19th century. Emphasizes the interaction of European, Native American, and African peoples; on the separation of the English colonies from Great Britain; and on the establishment and early history of the United States. Not open to majors or minors who elected HIST 410. 405W is writing intensive. 4 cr.

406/406H/406W. History of the Modern United States
History of the United States since the mid-19th century. Political, social, and economic developments as well as relationships of the modern U.S. with other countries. Not open to majors or minors who elected HIST 410. 406W is writing intensive. 4 cr.

410/410H. Historical Survey of American Civilization
Topical survey, within broad chronological divisions, of the development of American civilization since 1600. Not open to majors or minors who have elected HIST 405 or 406. Writing intensive. 4 cr.

421. World History to the 16th Century
The global experience of human communities with special emphasis on the development of the major civilizations and their interactions. Comparisons of social, cultural, religious, and political life and the emergence of distinctive and diverse human societies are examined. 4 cr.

422/422H. World History in the Modern Era
Emergence of major global human interactions due to the growth of major civilizations. The global context for the rise of the modern West. The rise and decline of Western global domination and the emergence of new states and changing societies throughout the world. 4 cr.

425/425H/425W. Foreign Cultures
Introduces the culture of a particular nation or region; preparation for experiencing a foreign culture. Consult department for listing of topics. 425W is writing intensive. 4 cr.

425H/435W, 436/436H/436W. Western Civilization
The classical origins and evolution of European civilization through the Renaissance, Reformation, and voyages of discovery. The rise of Europe to global supremacy in the 19th century and its transformation in the 20th century. 435W and 436W are writing intensive. 4 cr.

444. Through Their Eyes: The American Civil War from Primary Sources
Introduces the nature of historical research through an intensive study of the Civil War era, including slavery, abolitionism, and political conflict before the war, as well as the military, social, and political history of the war itself. Use of primary sources such as newspapers, public documents, letters, and diaries, including unpublished manuscripts held in Special Collections, Drexel Library. Writing intensive. 4 cr.

444A. When is War the Answer
Examines a series of foreign policy crises that might have led, and in some cases did lead, to war between the United States and some foreign foe. Using diplomatic documents, a basic diplomatic history text book, and a range of secondary sources, we will examine several times when the United States came to the brink of war, and we will ask when and why the nation has chosen to resolve its foreign policy problems with force. Topics include neutrality during the early Napoleonic wars, the War of 1812, the War with Mexico in 1846 and the avoided war with Britain of the same year, the Spanish-American War, both World Wars, Cuba and Vietnam, and the two Iraq wars. Students are able to connect decisions about war with larger trends and developments in U.S. history. In the end, they refine their understanding of when the nation has chosen to use force as well as their ability to apply that knowledge to future crises. Focus on policy making rather than the impact of war itself, although naturally historical lessons about war shape decision making. Writing intensive. 4 cr.

444B. Revolutions Across the Atlantic
An exploration of the Age of Revolution, 1776-1800 on both sides of the Atlantic. Beginning with Tom Paine's declaration "This Time to Part" that launched the American Revolution and ending with the spread of the French Revolution by bayonets into Switzerland, we investigate the clubs organized against the slave trade, we read the plays that projected imaginary revolutions onto desert islands, and we follow the rumors that spread news of Caribbean revolts to Philadelphia and Paris. This course will be primarily discussion, with some short writing assignments in the first half of the course. Students will research and write their own histories of some facet of revolutionary history in the second half of the course. Writing intensive. 4 cr.

444C. World War Propaganda in Britain and the United States
Examines multi-media propaganda in World War I and World War II Britain and the U.S. to investigate the total war experience, the relationship between these two nations, and the workings of a critical weapon. Propaganda was a bloodless weapon in an era of high-tech tools, but it was also a feared and ubiquitous one. Some of the issues addressed in this course include: Who were some of the targets of propaganda? How were posters different from films or radio broadcasts? What were the messages of propaganda? What does propaganda say about these nations as cultures and societies as well as about their war efforts? We analyze multimedia primary sources as well as use secondary ones in our discussions. Writing intensive. 4 cr.

444D. Slavery and Society in Pre-Colonial Africa
Examines the evolution and practice of the institution of slavery in Africa from the earliest times to the era of European colonialism. Using contemporary personal narratives by the slaves, the course examines specific historical contexts of various slave systems, continuity and change in the ideologies and practices of slavery, religion and slavery, race and slavery, gender and slavery, conditions of slaves, as well as the making and uses of slaves: as domestics, concubines, eunuchs, officials, soldiers, labor and capital. Using films, slide images, and a comparative approach, African slavery will be examined within the context of the early evolution of slavery in the Mediterranean and Islamic worlds as well as its later expressions in the Atlantic world of the Americas. 4 cr.

483. History of World Religions
Introduces the religions of the world in terms of historical development, relationship to society, belief system, central texts, and ritual practices.
Begins with the religions of small and tribal societies (e.g., African, Native American), moves through religions of complex societies (e.g., Hinduism), and then studies the various traditions that emerged from ancient revelations: Zoroastrianism, Buddhism, Judaism, Christianity, Islam, and certain new forms of Christianity. This initial survey of world religions prepares students for HIST 483. Writing intensive. 4 cr.

484. Patterns in World Religions
Introduces the comparison of religions and religious patterns. Examines trans-cultural themes like sacred places, sacred books, and sinthood.

Through readings, students become acquainted with methods used in the historical study of religions. Primary and secondary readings encompass a wide variety of religious practices and ideas in Hinduism, Buddhism, Christianity, Islam, Judaism, as well as tribal religions. Ethnographic readings supplement readings and lectures. Some classes may be recommended to accompany guest lecturers in medieval European history. Prereq: LATN 483 recommended. Writing intensive. 4 cr.

497/497H/497W. Explorations in Historical Perspectives
Seminar for freshmen and sophomores. In-depth exploration of a particular historical question or topic; for example, the French Revolution, Chaucer's England, or the New Deal. Students should consult with the Department of History for a list of topics and instructors. 497W is writing intensive. 4 cr.

500. Introduction to Historical Thinking
Basic skills essential to the study of history: critical reading of historical literature, improvement of written and oral analysis of historical material, and use of library resources. Intensive study of books and documents from varying historical fields and periods. Required of history majors; open to other interested students. Writing intensive. 4 cr.

501. Medieval Military History
Western societies from the Roman Empire to the emerging nation states of early modern Europe spent an enormous proportion of their surplus wealth on war. This course introduces this crucial aspect of Western history and examines the period extending from the third century AD, to just before the introduction of gunpowder weapons in the fifteenth century. Discussion of not only military tactics and famous generals but also the effect that war had upon society as a whole and the economic ramifications of war, the Christianization of war, and the effect of war upon literature. 4 cr.

502. Latin Readings in Medieval History
Provides students with an opportunity to read medieval sources in their original language. Helps students with a background in Latin improve their reading ability, and exposes them to the challenges of conducting historical research in a foreign language. Latin readings taken from many of the major medieval narratives sources from the fifth through the fourteenth century. Prereq: LATN 402 or equivalent. 1 cr.

503. Soviet Dreamers, Despots, and Dissidents
Through the study of individual biographies and writings of male and female Russian revolutionaries, Soviet leaders, and prominent dissidents, course examines the question of how the combination of Russian culture and Marxism created both cruel despotism and profound advocacy for social justice and universal human rights. Lecture and discussion. Response papers and essay exams. Readings include revolutionary texts, laws, biographies, novels, films, and scholarly articles about 20th century Russia/USSR. Writing intensive. 4 cr.

505. African American History
Experiences, aspirations, and contributions of black Americans from their ethnic origins in Africa to the present American crisis in race relations; comparative study of cultures and institutions. Colonial America to the Civil War. Writing intensive. 4 cr.

506. African American History
See description for HIST 506. Reconstruction to the present. Writing intensive. 4 cr.

507. Native Peoples of the Americas
Indian societies of the ancient continent, their reactions to, and interaction with, the Europeans who invaded and conquered them. Emphasis on North America. 4 cr.

509. Law in American Life
Investigates the role of law in American social, political, and economic life from the European settlements to the present. Traces the development of legal institutions, but focuses on the various functions of law (e.g., in structuring social relationships, allocating resources, defining government authority, expressing social and moral values, and as a mechanism for control). 4 cr.

511. History of New Hampshire
From pre-settlement times to the present, emphasizing the use of locally available materials and sources. Writing intensive. 4 cr.

512. Historical Geography of North America
Introduces major themes, important scholars, and commonly-used research techniques in historical geography. Course is reading and research oriented. Focus is on North America. Writing intensive. (Also listed as GEOG 586.) 4 cr.

521. Origins of Modern Science
Development of scientific ideas in Europe from the Renaissance through the Scientific Revolution to the Enlightenment. Topics include themes in the physical and biological sciences and their relations to cultural and social contexts. No special science background is required. 4 cr.

522. Science in the Modern World
Development of science, particularly in European and North America, from the 18th century to the present. Themes including Darwinism, the growth of modern physical and biological sciences and science in the contemporary world. No special science background is required. 4 cr.

531. Americas: Introduction to Latin America and the Caribbean
The thirty-three countries of the region are important trading partners and resource suppliers for the United States. Examines the history, culture, politics, economics, social structures, and the international relationships of this region. Ranges from the macro-level discussion of economics, to personal and family issues, to key moments in history, to aspects of local and transnational cultures. Individual country and regional examples illustrate larger processes affecting the whole region. Stereotypes and generalizations challenged by stressing the human face of national development, military rule, democratization, migration, urbanization, color, class, identity, women's roles, religion, popular culture, sovereignty, revolution, and the impact of immigrants from the region on the United States. 4 cr.

532. Modern Latin America
Provides a broad overview of Latin America from the 18th century to the present. It examines the breakdown of colonial rule, the establishment of independent countries, the formation of viable nation states, the importance of geography, the roles of the different elements of society. Social, political, and economic changes and continuities emphasized to give a sense of the ambiguities of the historical process. Cultural differences illustrated with word and music. The effects of elite rule and of United States interventions studied. Writing intensive. 4 cr.

537. Espionage and History
Introduces the history and politics of espionage and intelligence organizations in modern times. Special attention to intelligence work among the major powers in World War I, World War II, and the Cold War. Readings include autobiographical accounts and other primary sources as well as novels. 4 cr.

540. Foundations of Medieval History: 300-1300 CE
Introduces the history of Western Europe from the end of the Roman Empire to the late twelfth century. Particular focus on the history of Christianity, social and economic structures, the role of women in medieval culture, and literacy and learning. Writing intensive. 4 cr.

559, 560. History of Great Britain
History of Great Britain from the earliest times to the present; from social, constitutional, economic, political, and intellectual perspectives. Designed for history students as well as those interested in literature, Western political and social systems, American studies, education, and, prelaw. 4 cr.

563. Introduction to Russian Culture and Civilization
Interdisciplinary course on the development of Russian culture from its origins through the end of the 19th century. Historical documents, literary works, ethnographic materials, films, slides of Russian art, and music. 4 cr.

565. Women in Modern Europe
A social history of women in Europe from 1700 to the present. Examines the development of the "modern nuclear family," transformations in women's work during the industrial revolution, and women's political evolution from bread takers to petitioners. Sources include published diaries, historiographical studies, and novels. 4 cr.

566. Women in American History
Key changes in women's roles in the past three centuries with an emphasis on the peculiarities of the American setting. How, for example, were women's lives affected by the frontier; the intersection of Europe, African, and Native American cultures; religious diversity; the problem of defining citizenship in a democratic republic? Students will sample recent scholarship in women's history and study a wide variety of documents produced by women. 4 cr.

567. History of Canada
Covers the development of Canada from first contacts to the modern era, with an emphasis on the peculiarities of the American setting. The focus on Canada's position between Great Britain and the United States, Anglo-French tensions internationally, and the shifting place of the First Nations in Canadian society. 4 cr.
575. Ancient Near East
From the Neolithic revolution to the time of Alexander the Great. Rise of civilization; nature of human artistic and intellectual development in the earliest civilizations of Mesopotamia and Egypt; Judaism in its historical setting. 4 cr.

576. Hebrew Bible in Historical Context
An introductory study of the Hebrew Bible, or Old Testament, examining the development of biblical literature in the context of ancient Near Eastern cultures and history. Interpretations of the creation stories and patriarchal narratives using literary and folkloric methods; the transformation of Israelite religion from Moses to David to Ezra; the role of prophets and nature of ancient prophecy; the concept of the messiah; “wisdom” literature and the biblical interpretations of misfortune; the formation of a biblical canon; and the critical analysis of sacred texts. (Also offered as RS 576.) Writing intensive. 4 cr.

579. History of China in Modern Times
The transformation of Chinese society from 1600 to the present. Attention will be given to political and cultural developments as well as China's interaction with the outside world. 4 cr.

580. History of Japan in Modern Times
Explores major tendencies in Japanese history from the Tokugawa period to present. Will stress the interrelatedness of political, social, institutional, and literary developments so as to achieve a complex view of modern Japanese society. 4 cr.

583. Mystic and Saint in Islam
Examines how and why a cult of Sufi saints became such a significant part of religious practice in medieval Islamic Egypt and Anatolia. 4 cr.

The origins and expansion of Islam and the development of the Muslim community from the time of Mohammed until the Islamic empires of the 16th century. Attention is given to religious and artistic as well as political developments. 4 cr.

586. Islam in the Modern Age, 15th Century to present
Emergence of modern Middle Eastern states and societies from the time of the Ottoman Empire to the present. A survey of major developments, including the emergence of nationalism, the Islamic resurgence, and social transformations. 4 cr.

587. History of Africa South of the Sahara
From ancient times to the present. Semester I: from prehistoric times to 1870. African migrations, kingdoms, and societies; African responses to the slave trade; Islam; European imperialism, colonialism, and industrialization; African nationalism, independence, and post-independence problems. 4 cr.

588. History of Africa South of the Sahara
From ancient times to the present. Semester II: from 1870 to present. African migrations, kingdoms, and societies; African responses to the slave trade; Islam; European imperialism, colonialism, and industrialization; African nationalism, independence, and post-independence problems. 4 cr.

#589. Islam in Africa
Focuses on the advent, spread, and major consequences of Islam in Africa. Examines the major phases of Islamic expansion: early conquests in North Africa and the Iberian Peninsula, the spread of Islam across the Sahara into the Sudan, the jihadist and reformist movements of the 18th and 19th centuries and the development of Islam during the colonial and postcolonial era. Emphasizes the varieties of the practice of Islam, the role of Islamic states formation and the impact of Islam on the religious and social life of the African peoples. The intersections of Islam with the issues of trade, slavery, politics, gender, imperialism, and modernization, the rise of Islamic fundamentalism, the place of North Africa within the Mediterranean Islamic culture, as well as the relationships of Islam with indigenous religions and with Christianity in African history and societies explored. 4 cr.

595, 596, 598, 599 Explorations
See department listings for semester topic. 1 to 4 cr.

600. Advanced Explorations
See department listings for semester topic. Barring duplication of subject, may be repeated up to a maximum of 8 credits. 1 to 4 cr.

601. Seminar in Religious Texts
Close study of sacred text(s) from a particular religious tradition (Islam, Christianity, Buddhism, Judaism, etc.) or a thematic selection of texts across religions. (Also offered as RS 601.) 4 cr.

602. Holocaust: The War on Europe's Jews
The attempted destruction of European Jewry during the Third Reich is one of the pivotal events in the history of modern Western Civilization. Course explores the circumstances and behavior of the Jews (as victims, resisters, survivors), the perpetrators (German and non-German), bystanders (German, European, and American), and rescuers (German and non-German). Attention is also given to such post-1945 matters as justice, compensation, and memory. 4 cr.

603. European Conquest of America
Study of the social consequences of colonization, migration, and war in America, 1500-1775. Emphasis on the interaction of British colonies with competing European cultures (French, Dutch, Portuguese, and Spanish), with Native Americans, and with African American slaves. 4 cr.

605. Revolutionary America, 1750-1788
Examines the social, political, and cultural transformation of thirteen British colonies into the United States, up to the adoption of the Constitution. 4 cr.

606. History of the Early Republic
Explores the histories of the people and institutions that transformed the new United States from a coastal republic of largely independent freeholders to a transcontinental democracy increasingly driven by class. Topics include slavery, the family, reform movements, and the formation of national identity. 4 cr.

#607. Religion in American Thought and Life
Interdisciplinary study of American religious experience and its relationship to other aspects of American culture, taught by a team of three specialists, each in a different discipline: American intellectual and cultural history, American literature, and American church history. Central emphasis on several transforming themes of the 19th century and their effects upon the interplay of religion and society. (Also offered as ENGL 607, HUMA 607, and RS 607.) Writing intensive. 4 cr.

608. Arts and American Society: Women Writers and Artists, 1850-1890
Team-taught course studying the impact of gender definitions on the lives and works of selected American artists. Considers lesser-known figures such as Fannie Fern, Lily Martin Spencer, and Mary Hallock Foote as well as better-known artists such as Willa Cather and Georgia O'Keefe. Prereq: permission or one of the following: WS 401, HIST 566, ENGL 585 or 586, ENGL 685 or 785, or a 600-level art history course. (Also offered as ARTS 608, ENGL 608, and HUMA 608.) Writing intensive. 4 cr.

609. Special Topics in American Legal History
In-depth thematic exploration of law in American life. Topics include race and equality in America; community, pluralism, and American law; property, liberty, and law; gender and law. May be repeated for credit with instructor's permission. Prereq: HIST 509 or instructor's permission. Consult department listings of topics. Writing intensive. 4 cr.

611. Civil War Era
Surveys the period from the presidency of Andrew Jackson to the end of the Reconstruction. Focuses on causes, course, and consequences of the Civil War. Topics include slavery in the Old South, antebellum reform movements, creation and breakdown of the Second Party System, social and economic (as well as military) events during the war and major developments during Reconstruction after the war. 4 cr.

#612. Emergence of Industrial America
Investigates the economic transformation of 19th-century America from a rural, agricultural society to an urban, industrial one. Explores the sweeping economic changes and focuses on such topics as change in work and leisure, westward expansion and its effects on Native Americans, shifts in gender roles, growth of a consumer culture, rise of the labor unions, Populism, immigration, reform and regulation movements, growth of American imperialism, and intellectual developments. 4 cr.

615. United States Progressivism to the New Deal
Study United States from 1900 to 1941: cultural, political, and social factors causing major changes in American life. 4 cr.

616. United States Since World War II
Study United States since 1941; cultural, political, and social factors causing major changes in American life. 4 cr.

617. Vietnam War
An advanced interdisciplinary study of the American experience in Vietnam which utilizes fiction, film, music, and historical analysis to examine such matters as how and why the United States became involved in Vietnam, went to war there, and failed to win, as well as the consequences and legacies of that fateful conflict. It is strongly suggested that students first complete courses in modern American history. 4 cr.

618. American Environmental History
Examines how nature has been a factor in American history and how Americans have wrestled with the concepts of nature and culture. Topics include industrialization, evolution, conservationism, environmentalism, and environmental diplomacy. 4 cr.

619, 620. Foreign Relations of the United States
The history of American diplomacy from the colonial era to the present, with the dividing point at 1900. The focus will be on both the foreign and domestic influences that shaped American diplomacy. 4 cr.

#621. History of American Thought
Significant American thinkers considered in their social context. Dividing point at 1860. 4 cr.
622. History of American Thought
Significant American thinkers considered in their historical context. 1860 to present. 4 cr.

#623. Early American Social and Cultural History
Gives students the opportunity to explore some of the recent findings of scholars who have studied Early American social and cultural history. Focuses on the experiences of Anglo-Americans and on the experiences of many of the other people with whom Anglo-Americans were frequently in contact, and who also shaped Early America. Includes consideration of the pan-Atlantic context of Early America, cross-cultural contacts, family and gender, labor systems, religious observations, crime, and other themes explored in recent social and cultural theory. 4 cr.

624. Topics in Modern United States Social History
Advanced study of topics in U.S. social history since the Age of Jackson. Topics will vary; may include slavery and the antebellum South, reform movements in U.S. history, family history, labor history, the impact of war on American society, race in recent U.S. history. May be repeated as topics change. 4 cr.

625. Southern History and Literature since the Civil War
Equal focus on the history and literature of the South since the Civil War. Topics include reconstruction, the age of segregation, and the Civil Rights Movement. Literary focus is on the period since 1920, including the "Southern Renaissance." Authors include William Faulkner, Robert Penn Warren, Flannery O'Connor, and Zora Neale Hurston. 4 cr.

631. History of Brazil
Brazil has the fifth largest territory, the sixth largest population, and the eighth largest industrial economy in the world. Its colorful history has many distinctive features: the only country in the Americas to have been the capital of a European monarchy and then to have its own emperor for most of the last century; an outwardly peaceful image masking internal violence and turmoil; a suspicion of foreigners balanced by a desire to be accepted by them as equals; seemingly benevolent racial attitudes that serve to keep people of color on society's lower range; a tremendous cultural creativity that has given the world samba, film star Carmen Miranda, composer Hector Villa Lobos, songwriter Antonio Carlos Jobim, poet Vinicius de Moraes, and novelist Jorge Amado. Includes an examination of the roles of various elites: political, social, economic, military, cultural, and religious. HIST 531, 532 recommended. 4 cr.

632. Latin American History: Topics
Topics vary (see department listing for current semester). Seminar entails reading, discussion, and research on literature and documents related to the selected topic. Provides students with the opportunity to do research under close direction. 4 cr.

633. Medieval England 800-1300
This course provides students with an opportunity to gain an in-depth understanding of the history of medieval England from the beginning of the period of consolidation under the Wessex dynasty in the ninth-century through the end of the thirteenth century. In addition to obtaining a large corpus of information through the reading of a significant monographs dealing with England during this period, students will be challenged to develop the critical analytical skills necessary for the thorough understanding and practice of historical methodologies, with a particular focus on the practical methods of writing medieval history. Finally, students will be given the opportunity to improve their communications skills through extensive class discussions dealing with the scholarly works read for this course, and in writing assignments. 4 cr.

634. Medieval Empires
This course will explore the intellectual and political foundations of imperial rule in the Middle Ages with a particular focus on the Carolingian, German, and Byzantine empires of the early and high Middle Ages. The course will begin with the development of the idea of empire under Alexander the Great and then during the Roman empire. The course will then turn to an examination of how the rulers of the three great empires of the western Middle Ages adapted the classical ideas and practices of empire for their purposes. The course focuses on sources. Background material will be provided in short lectures. 4 cr.

640. Holy War in the Holy Land: The Medieval Crusades
Survey of the medieval military expeditions organized by Christians to secure the Holy Land during the 12th and 13th centuries. Topics considered include the formulation of a "just war" theory; political, intellectual, religious, and military interactions between Christians, Jews, and Muslims; the Crusader State of Jerusalem; and the histories of individual crusades. 4 cr.

641. Europe after the Black Death
explores the dramatic changes that characterized Western Europe as it rebounded in the fifteenth through the seventeenth centuries from the ravages of the Black Death of 1348. Examines the social, political, and artistic developments in late medieval and Renaissance Italy before "crossing the Alps" to trace the expansion of Renaissance culture in Northern Europe. Topics include the humanist movement; new patterns of social organization; and the revival of classical antiquity in the arts, architecture, religion, and political theory; the effects on the modern society of the encounter with the "New World"; shifting roles for men and women in early modern European societies; religious war and conflict. 4 cr.

#642. Religious Conflict in Early Modern Europe
Religious, social, and political maps of Europe were profoundly and permanently altered in the sixteenth and seventeenth centuries due to the split of the Protestant churches from the Roman Catholic church initiated in 1517 by Martin Luther. Explores the background to the Protestant Reformation of the sixteenth century and investigates the various personalities— the Protestant and Catholic reformers; the princes, artisans and peasants; the Anabaptist radicals—who shaped this era of religious change and conflict. Also explores the important effects of religious change on European society and culture at that time, including changes in gender roles, family life, and popular cultural practices such as magic and witchcraft. 4 cr.

644. Victorian Britain
The Victorian Era was a time of contrasts. Upon the throne sat Queen Victoria, a monarch known for her moral uprightness, sexual probity and rigid sense of decorum. The streets of London, however, teemed with prostitutes, pickpockets and impoverished Irish immigrants whose lives seemed untouched by either the prosperity or moral stringency that characterized the age. In this class we explore the varieties of Victorian experience both at home and in the global empire Britain had established during the nineteenth century. Examining sources such as the novels of Charles Dickens, the decorative arts of William Morris, and the scientific writings of Charles Darwin, we attempt to uncover the many-faceted culture, society and political life of Victorian Britain. The instructor places a strong emphasis on reading, class participation and writing. 4 cr.

647. Early Modern Franc
Explores the culture and politics of early modern French society. Popular culture, religion, gender relations, the family, state-building, political theory, and revolution are emphasized. Primary documents in translation are read and discussion is encouraged. 4 cr.

#648. Modern France
French society from Napoleon to Mitterrand. Topics include the Revolution of 1848 and the Paris Commune; World Wars and the Vichy regime; Existentialism, DeGaulle, and the Revoit of May-June 1968. 4 cr.

652. Topics in European Intellectual History
Explores such major developments as the Enlightenment, Russian intellectual history, and the relationship between gender and intellectual history. Includes topics since the Renaissance. Since topics vary, students should check the department newsletter or office for course theme in any given term. May be repeated as topics change. 4 cr.

654. Topics in History of Science
Advanced study of a selected topic in the history of European science since the Renaissance. 4 cr.

656. 20th Century Europe
World War I, European totalitarianisms, World War II, the loss of European primacy and the search for a new Europe. 4 cr.

661, 662. England in the Tudor and Stuart Periods
Political, religious, socioeconomic, and intellectual foundations for change at work in England from the accession of Henry VII to the revolution of 1688-89. 4 cr.

664. Russia: Modernization through Soviet Empire
The challenges of modernization, experience and legacy of Leninist and Stalinist revolutions. Soviet consolidation and decline through the Gorbachev era. 4 cr.

665. Themes in Women's History
In-depth examination of a selected topic in women's history. Topics may include Women and Health, Women in Modern European Political Theory, Comparative History of Women and Revolution. See Time and Room Schedule for course theme in any given term. May be repeated for credit with permission of instructor. 4 cr.

#666. Environmental History of Northwest Atlantic Commercial Fisheries
After centuries of groundfishing humans have radically transformed the northwest Atlantic marine ecosystem, creating a tragedy for both fish and fisherman. This marine environmental history course considers the changing technology, ecology, and sociology of the commercial fishery off New England and the Canadian maritime from 1500 to the present. 4 cr.
669. Germany from 1918 to Present

While the revolution of 1918 and the Weimar Republic were characters of the intellectual and cultural sphere of the Weimar Republic, the rise of Nazism, the Holocaust, the foundation of the German Democratic Republic and Federal Republic and their evolution in the shadow of the Cold War, and concludes with the unification of Germany after the fall of the Berlin Wall in 1989. 4 cr.

#670. Historical Thinking for Teachers

Examines the sources, methods, and interpretative strategies of the historian. Emphasizes texts and topics relevant to the middle- and high-school classroom. Designed for history teachers as well as individuals in the Master of Arts in Teaching program. 4 cr.

675. Early History of Ancient Greece

Greek history from the Minoan and Mycenaean eras through the Persian Wars of the early fifth century. Emphasis on original sources including the Homeric epics, Plutarch, Sappho, and Herodotus. Examination of the distinctive developments of political systems in Sparta and Athens, as well as issues of colonization, diplomacy, religion, and culture. Thorough discussion of types of available evidence and their integration into historical understanding. 4 cr.

676. Classical and Hellenistic Greek Worlds

Greek history from the Persian Wars of the early fifth century through the life of Alexander the Great and the creation of the Hellenistic world. Emphasizes original sources including Herodotus, Thucydides, the Athenian playwrights, and Plato. Examines the transformation from city-state political organization to large Hellenistic kingdoms, as well as discussion of Greek historiography, intellectual life, and social theory. Thorough discussion of types of available evidence and their integration into historical understanding. 4 cr.

677. Roman Republic

Covers pre-Roman Italy, the Etruscans, and the foundation of the Republic, Rome's expansion through the Punic Wars, relations with the Hellenistic kingdoms, and disintegration and fall of the Republic. Includes discussions of Roman art, engineering, and political theory. Emphasizes original sources in philosophy, history, and literature. 4 cr.

678. Roman Empire

Collapse of the Roman Republic and creation of the Augustan principate. History of the principate through the division of the empire, with discussion of the fall of Rome in the west and the eastern empire through Justinian. Discusses Roman art, literature, philosophy, and religious developments such as the proliferation of mystery religions and the rise of Christianity. 4 cr.

679. Rights Revolution

It is all but impossible to think or talk about contemporary legal and moral controversies without invoking the idea of "rights." Yet few of us can claim a clear understanding of this pivotal concept. Historically, how have particular claims, preferences, and socio-economic interests attained the status of "rights"? Are there other ways to conceptualize and prioritize rights, other forms of "rights talk," than the ones we currently employ? History 679 takes as its point of departure the enormous expansion in rights claimed by both individuals and groups in recent decades—the "rights revolution." This development has elicited both praise and alarm, and we will examine the philosophical, moral, and political dimensions of each. 4 cr.

681. Modern China Topics

Problems in modern Chinese history from 1800 to the present. Topics may vary. Students read translated primary sources, analyze literary works, and write critical essays and a research paper. History 579 is recommended. 4 cr.

682. Cults and Charisma

Examines religious sects and charismatic leaders using case studies from history and the contemporary world, as well as analytical principles from religious studies and anthropology. Explores various approaches to the question: what makes a person powerful over others, in connection with the formation of messianic sects, the genesis of the "cult," the traditional authority of priests and kings, saint-hood, the events at Jonestown and Waco, and the popular image of the "cult." Students learn to employ a variety of tools and models to understand historical situations of charismatic leadership. (Also offered as RS 682.) 4 cr.

684. History of Southern Africa since 1652

Examines the major themes in the history of a troubled sub-region of Africa. In-depth exploration of the nature and impact of socio-cultural forms, the evolution of centralized societies, the initiative and expansion of white settlements, and the Mfecane revolution. Analysis of the dynamics and consequences of European imperialism, economic competition and industrialization, European settler-nationalism, racial conflict, slavery, and gender politics, Indian and African nationalisms, democratization, and development in post-colonial and post-apartheid Southern Africa. 4 cr.

685. Modern Middle East

From the 18th century to the present. Problems created by modernization and reform of the traditional societies and the rise of nationalism, and appearance of new ideologies. 4 cr.

#686. States and Societies in Precolonial West Africa

An in-depth exploration of the nature and dynamics of state formation processes in West Africa. Focuses on major states such as Ghana, Mali, Songhai, Asante, Dahomey, Oyo, Benin, Borno and the Hausa states. Through a critical analysis of primary and secondary sources, film footage and video documentaries, the course examines the significance of such issues as oral tradition, migration, religion, art, slavery, gender, trade, state, kingship and warfare in African history. 4 cr.

688. African Religions

An interdisciplinary introduction to basic principles of African religions including historical and recent developments in the study of religion in Africa. Covers the place of religion in African societies and the interrelatedness of religion with myth, ritual, music, art, orality, gender, economics, social process, illness and healing, and kingship and power. Particular attention to African religions in the Americas and the history and impact of Islam and Christianity in Africa. Helps students to understand what is typical about African and special about African religion, while appreciating the role of religion in non-Western societies. Slides, films, maps, and other visual aids as well as readings. 4 cr.

689. New Testament in Historical Context

Introduces the collection of writings known as the New Testament as both literature and historical documentation. Assigned readings from primary and secondary sources stress the historical, social, religious, and literary backgrounds of gospels, Paul's letters, and the Apocalypse, and include a variety of early Christian texts left out of the canonical New Testament. Will touch on more general themes such as the religious world of the Roman Mediterranean, Judaism in the time of Jesus (and the Jewish character of the early Jesus-movement), apocalyptic visions and expectations, the diversity of "Christologies" in the century after Jesus' crucifixion, the formation of the Christian Bible, and the interpretation of parables. Emphasizes the historical-critical, rather than confessional, understanding of early Christian documents. (Also listed as RS 689.) Writing intensive. 4 cr.

#690. Introduction to Public History

Introduces the theory, methodology, and practices of public historians. Examines the history and contemporary practices of historians whose research and scholarship is aimed at public audiences through the creation of diverse media and interpretive frameworks. Encourages interdisciplinary thinking about history. Cr/F. 4 cr.

691. Internship

Supervised internship with a governmental agency, private corporation, philanthropic institution, library, archives, museum, historical society, or other institution seeking individuals interested in historical research. Cr/F. 4 cr.

695. Independent Study


698. Museum Studies

Supervised position with a museum, historical society, archive, or other history related site. Cr/F. 4 cr.

701. Seminar: Historical Explorations

A seminar for advanced undergraduates and graduate students on a selected topic. Topics will vary by semester. This course is discussion-based and meets once a week. There are no prerequisites for this course, but students should expect to be assigned substantial reading and writing. 4 cr.

711. Museum Studies

Introduction to theory, methods, and practice of museum studies. Examination of various museum functions, as well as contemporary historical controversies. 4 cr.

772. Studies in Regional Material Culture

Introduces the theory and methodology of material culture, that is, the study of history through the analysis of buildings, human-created landscapes, and artifacts made and used in the United States, particularly in New England. May be repeated for credit with permission of undergraduate adviser. 4 cr.

774. Historiography

Analysis of ancient and modern historians. Open to undergraduates with permission. (Not offered every year.) 4 cr.
403. Introduction to Food and Beverage Management
Focuses on the basic principles of food and beverage operations management. During weekly laboratory sessions in the New England Center for Continuing Education, students experience both the front of the house and back of the house activities. Application of classroom principles further enhanced through industry guest, field trips, participation in gourmet dinner productions, and a class managed and produced catered function. Prereq: permission. Special fee. 4 cr.

554. Lodging Operations Management
Focus on management history, planning, organizing, leadership, and current and future management issues. Requires students to compare rooms-division management in a large hotel with that of a small hotel, including reservations, front desk operations and accounting, housekeeping, and auxiliary functions. The complexities and the terminology of the design, management, and maintenance of physical structures used by civil engineers and architects are integral to the course. Guest lecturers include hotel general managers and department heads who highlight students’ projects. Pre- or Coreq: HMGT 401. 4 cr.

567. Food and Beverage Operations Management
Integration of operations management principles and techniques. Presentation of large-scale gourmet dinners; act as managerial consultants to on-campus food service facilities. The lab provides an experimental setting for the application of such principles as marketing, operations management, accounting and organizational behavior through the planning, organizing, coordinating, and execution of weekend food service events. Lab. Special fee. 4 cr.

595. Internship I
A nontraditional academic experience relating to work experience within the university system. Coordinated by a faculty member who provides supervision, along with an on-site supervisor, through regular class meetings. Includes academic or research projects and a written report. May be repeated to a maximum of 12 credits. Prereq: permission and good academic standing. Cr/F 1 to 12 cr.

600. Hospitality Marketing Management
Students apply basic marketing principles to the competitive environment of service businesses, such as hotels, restaurants, and other hospitality firms. Strong emphasis on consumer behavior, services management theory, and the hospitality marketing mix as they relate to service firms of all types. Course material is presented through a variety of techniques: case studies, lectures, guest speakers, team projects, and written assignments. Pre- or Coreq: HMGT 401, 403, 554, 556. Writing intensive. 4 cr.

603. Service Industries Management
Provides broad understanding of managerial issues in the operation of service firms, as distinct from those in manufacturing firms, e.g., lodging, restaurants, health care, banking, and education. Examines, from the viewpoint of the service firm manager, the role services play in the economy, delivery systems, encounters, technology, human resources, productivity, and quality issues, along with the concept of service. Pre- or Coreq: HMGT 401, 554, 556, 618. 4 cr.

618. Uniform Systems for the Hospitality Industry
Following a review of financial statements and an introduction to the Uniform System of Accounts for Hotels and Restaurants, students learn specific applications of managerial accounting and decision support systems for the hospitality industry. Topics include cash flow analysis, cost management, cost-volume-profit analysis, pricing models, budgeting, and forecasting. Students develop an understanding of computer software and back-and-front office computer systems as they relate specifically to the hospitality industry. Lectures, computer exercises, and papers. Prereq: ADMN 502. 4 cr.

625. Hospitality and Employment Law
Covers legal issues in the hospitality industry. Emphasizes a managerial approach to solving or avoiding potential problems including employment law issues that arise in any business environment: wrongful termination, compensation rules, affirmative action, employment discrimination, sexual harassment, and issues involving privacy in the workplace. Prereq: junior standing. 4 cr.

635. Hospitality Human Resource Management
Addresses key hospitality resource management issues of a general, technical, and social nature including communication, motivation and leadership, job stress and safety, security, government regulations, discrimination, and substance abuse. Covers technical areas such as recruiting and selecting, placement, employment, training, performance appraisal, disciplining, and termination. Pre- or Coreq: ADMN 611. Writing intensive. 4 cr.

655. Hospitality Finance and Development
Provides the advanced student with a familiarity of the principles and practices of development and acquisition of hotel, restaurant, and other hospitality businesses, and the real estate development process. Emphasizes market and financial evaluation and decision making relative to economic, ethical, legal, and social aspects of the organization’s environment. Group projects involving the preparation of a complete economic feasibility study for hotel or restaurant development or acquisition or repositioning are required. Prereq: HMGT 600, 618. Pre- or Coreq: HMGT 603. 4 cr.

661. Meeting Planning Management
Strategic and logistical considerations in managing the planning, development, marketing, and implementation of meetings, conventions, and events. 4 cr.

667. Advanced Food/Beverage Operations Management
A project management course integrating management principles and techniques in the presentation of large scale gourmet dinners. Examines services operations management: planning and forecasting, marketing and sales, production delivery systems, service encounters, technology, purchasing and inventory management, human resources, scheduling, productivity and quality issues. Prereq: HMGT 401, 403, 554, 556 and junior or senior standing. Pre- or Coreq: HMGT 618. 4 cr.

681. Resort Management
Complexities of developing and managing various types of resort properties. Emphasis on time-share properties and recreation elements of full service resorts. Special fee. Writing intensive. 4 cr.

685. Study Abroad
Open to students studying abroad in the discipline as approved by the hospitality management program director. Cr/F E 1 to 16 cr.
686. Study Abroad
Open to students studying abroad in the discipline as approved by the hospitality management program director. Special fee. Cr/F. 1 to 16 cr.

695/695W. Independent Analysis
Study and research project for honor students to advance knowledge in lodging and food services fields. Prereq: junior standing and permission. 695W is writing intensive. 2 to 10 cr.

696. Supervised Student Teaching Experience
Participants are expected to perform certain functions as attending classes, leading discussion groups, assisting faculty, presenting information in undergraduate courses that they have successfully completed, holding office hours, grading papers and exams. Enrollment is limited to juniors and seniors who have had above average GPAs. May be repeated to a maximum of 8 credits. Prereq: permission of instructor, program director, and director of advising. Cr/F. 1 to 8 cr.

698. Topics
Special topics and developments in lodging, food services, and other hospitality industries. Prereq: junior standing and permission. Course may be repeated when topics change. 1 to 4 cr.

703. Strategic Management in the Hospitality Industry
Capstone course, interrelating and applying strategic management concepts to hospitality organizations. Cases from hotel companies, restaurant chains, and other hospitality-related businesses, supplemented by economic and other published information from the industry, are used as departure points for class discussion. Prereq: senior standing. Writing intensive. 4 cr.

750. Senior Operations Seminar
Allows students to experience and participate in the planning and decision-making process of a full-service hotel; to contribute to and understand the intricacies of managing change while gaining a sensitivity to interdepartmental coordination. Class meets at major metropolitan hotels. Prereq: permission. Special fee. 4 cr.

756. Franchising
Designed to help the student acquire an understanding of franchising as a system of distribution and business expansion. Franchising is studied from both the perspectives of the franchisee and the franchiser. In addition, economic, financial, and legal issues associated with franchising are covered. By the end of the course, students acquire the skills and sources of information that would permit sound assessment of the business opportunities available in franchising. Prereq: MKTG 651 or HMGT 600. Also offered as MKTG 756. 4 cr.

771. Beverage Management/International Wines
Examination of purchasing, evaluation, storage, service, and control of alcoholic beverages. Emphasizes wines, although beer, ale, distilled spirits, liqueurs, and mixed drinks are examined. Enrolled students must be at least 21 years old. Prereq: permission. 4 cr.

777. Casino Management
History, development and management of casinos and gaming. Emphasizes environment, operations, regulation, accounting, auditing and taxation of casinos and gaming. Investigates the economics, moral and cultural issues of gaming. Field trip required. Enrolled students must be at least 21 years old. Prereq: permission. Special fee. 4 cr.

795. Internship II
Off-campus work in the hospitality industry for on-the-job skill development. Normally supervision is provided by a qualified individual in the organization with frequent consultation by a hotel program faculty sponsor. A written report is required of the student. Internships may be part-time or full-time, with course credits assigned accordingly. May be repeated to a maximum of 12 credits. Prereq: permission and good academic standing; junior and senior standing. Cr/F. 1 to 12 cr.

799. Honors Thesis/Project
Supervised research leading to the completion of an honors thesis or project; required for graduation from the honors program in hospitality management. Prereq: permission of director of undergraduate programs and department chair. Writing intensive. 4 to 8 cr.

830. Contemporary Issues
An inquiry course that introduces first-year students to the major currents in the philosophy, art, literature, and science of ancient civilization. Critical analysis of ancient contributions to the philosophy of art and science. 4 cr.

850. The Renaissance
An interdisciplinary course in the literature, art, and thought of the Renaissance. 4 cr.

851/851A-D. Renaissance: An Interdisciplinary Introduction
Explores the central paradoxes of our culture in the modern age. Is there such a thing as "progress" and if so what is its nature? What is the relation of conscious and unconscious? Is the contemporary world devoid of meaning? Questions such as these are examined in relation to works since the 18th century in the fields of literature, history of science, philosophy, and art. Writing intensive. 4 cr.

853/853A-D. Modern World: An Interdisciplinary Introduction
Explores the central paradoxes of our culture in the modern age. Is there such a thing as "progress" and if so what is its nature? What is the relation of conscious and unconscious? Is the contemporary world devoid of meaning? Questions such as these are examined in relation to works since the 18th century in the fields of literature, history of science, philosophy, and art. Writing intensive. 4 cr.

854/854A-D. 20th Century, 1900-1945: An Interdisciplinary Introduction
Explores the central paradoxes of our culture in the modern age. Is there such a thing as "progress" and if so what is its nature? What is the relation of conscious and unconscious? Is the contemporary world devoid of meaning? Questions such as these are examined in relation to works since the 18th century in the fields of literature, history of science, philosophy, and art. Writing intensive. 4 cr.

Explores the central paradoxes of our culture in the modern age. Is there such a thing as "progress" and if so what is its nature? What is the relation of conscious and unconscious? Is the contemporary world devoid of meaning? Questions such as these are examined in relation to works since the 18th century in the fields of literature, history of science, philosophy, and art. Writing intensive. 4 cr.

856. American Life and Thought
Amplifies and expands the material presented in the course ENGL 305, 305A-D. Designed for students desiring a full and intensive examination of American life, thought and culture from colonial times to the present. 4 cr.

857. American History
This course examines the relationships of literature, art, philosophy, and science in the first half of the twentieth century. Topics include the rise of modernism in literature and the arts, the distinctive themes of 20th century philosophy, and crucial innovations in the sciences. Students study the works of such figures as Picasso, Woolf, Einstein, Freud, and Wittgenstein. 4 cr.

858. American Literature
This course examines the relationships of literature, art, philosophy, and science since the middle of the twentieth century. Topics include the philosophical and literary implications of the Holocaust and nuclear weapons, movements in the arts and literature since World War II, the rise of the sciences of life and information, and postmodernism. Students study the works of such figures as Arendt, Turing, Beckett, and Pollock. 4 cr.

859. Special Topics in the Humanities
Special topics; offered occasionally. May be repeated up to a maximum of 12 credits. 2 to 8 cr.

860. American Character: Religion in American Life and Thought
Interdisciplinary study of American religious experience and its relationship to other aspects of American culture, taught by a team of three specialists, each in a different discipline: American intellectual and cultural history, American literature, and American church history. Central emphasis on several transforming themes of the 19th century and their effects upon the interplay of religion and society. (Also offered as ENGL 607, HIST 607, and RS 607.) Writing intensive. 4 cr.

866. Arts and American Society: Women Writers and Artists, 1850-Present
Team-taught course studying the impact of gender definitions on the lives and works of selected American artists. Considers lesser-known figures such as Fannie Fern, Lily Martin Spencer, and Mary Hallock Foote as well as better-known artists such as Willa Cather and Georgia O'Keeffe. Prereq: permission or one of the following: WS 401, HIST 556, ENGL 585 or 586, ENGL 685 or 785, or a 600-level art history course. (Also offered as ARTS 608, ENGL 608, and HIST 608.) Writing intensive. 4 cr.

869. Ethnicity in America: The Black Experience in the 20th Century
Team-taught course investigating music, literature, and social history of black America in the period of the Harlem Renaissance, the Great Depression,
#610. Regional Studies in America: New England Culture in Changing Times
Team-taught course investigating some of the major contributions New England has made to American life. Focusing on three periods: the Puritan era, 1620-90; the Transcendental period, 1830-60; and the period of emerging industrialism in the late 19th century. Prerequisite: second-semester sophomore. (Also offered as HIST 610, ENGL 610, and ARTS 610.) Not for art studio major credit. Writing intensive. 4 cr.

650. Humanities and the Law: The Problem of Justice in Western Civilization
Interdisciplinary modular course examines interpretations of the nature of justice, its origins, the role of the professional judiciary, and the relationship of law and ethics. Students take three successive five-week writing projects under the direction of a member of the core faculty of the humanities. (Not offered every year.) Writing intensive. 4 cr.

651. Humanities and Science: The Nature of Scientific Creativity
Interdisciplinary modular course examines the historical and intellectual foundations of the physical, biological, and human sciences. Students take three successive five-week modules during the semester. (Not offered every year.) Writing intensive. 4 cr.

698. Independent Study
Independent study open only to highly qualified juniors and seniors who have completed at least four humanities courses above the 400 level. Requires original research and substantial writing projects under the direction of a member of the core faculty of the humanities. Prerequisite: HUMA junior or senior majors; four HUMA courses above the 400 level. 4 cr.

700. Seminar
Provides an opportunity for in-depth reading, viewing, and/or listening to texts and artifacts. Emphasis on the multiple perspectives and methodologies that can be brought to bear upon these works from several humanistic disciplines. Writing intensive. 4 cr.

730. Special Studies
Selected topics not covered by existing courses, with subjects to vary. May be repeated for credit. Prerequisite: one 400- or 500-level HUMA course or junior standing. Writing intensive. 4 cr.

798. Research Seminar
Provides a context within which students may discuss and receive direction in the course of completing a major research paper. At the end of the seminar, students present their research to the faculty and their fellow students. Prerequisite: senior standing; permission. Writing intensive. 1 cr.

799. Research Seminar
Provides a context within which students may discuss and receive direction in the course of completing a major research paper. At the end of the seminar, students present their research to the faculty and their fellow students. Restricted to majors. Prerequisite: HUMA 798; senior standing; permission. Writing intensive. 3 cr.

### Intercollege (INCO)

(For program description, see page 111.)

400. Graduate Preparation Seminar
A survey seminar that explores issues related to graduate school preparation. Topics include graduate school culture, academic research, the role of multicultural scholars, faculty relations, the graduate record exam, resume/vita development, and financing graduate education. Prerequisite: Enrollment in McNair Scholars Program. Cr/F. 1 cr.

401. Writing Intensive Seminar
Nature and experience of modern warfare and its historical development; social and biological roots of war; national security and defense concepts and issues; the nuclear age and weapons of mass destruction; the post-Cold War age; philosophical issues. Writing intensive. 4 cr.

402, 402H. Peace
Investigates 1) military deterrence in theory and practice; 2) alternatives to military deterrence such as diplomacy, international law and conflict resolution, and nonviolent defense; 3) economic and environmental interdependence of nations; and 4) political, cultural, ethical, and religious conceptions of peace. 4 cr.

403. Healthcare Professions Seminar
This seminar is designed for students (primarily first year primarily first year undergraduates, but to include any others) who are in the initial phase of preparation to a career in allopathic or osteopathic medicine, dentistry, podiatry, optometry, physicians assistant, chiropractics, physical therapy, pharmacy, or naturopathic medicine. Through readings and discussion students will become informed about current topics in healthcare, and specifically about these professions, requirements for admission to degree programs, and about how to become a competitive applicant. Cr/F. 1 cr.

410. Introduction to College Teaching
Evolving role and function of colleges and universities in American higher education. Issues involving the professorate including teaching, scholarship and service as the framework for an academic career. 2 cr.

430. Interdisciplinary Science
Advanced topics in selected areas of science through interdisciplinary lectures, demonstrations, hands-on laboratory experience, and field trips; the use of mathematical and computer skills in science; social, economic, environmental, and ethical applications and implications of recent advances in the selected area of science; the process of research. Restricted to high school juniors and seniors by permission only. 4 cr.

450. Introduction to Race, Culture and Power
Explores the ways in which the concept of "race" serves to justify global relationships of domination and inequality and is embedded in U.S. society. Examines how dominant powers use "culture" to maintain subordination and how subordinated peoples use "culture" to resist exploitation. (Also listed as ANTH 450.) 4 cr.

480. Arts in Society
Brings students into relationship with classical visual and performing arts. Students attend lectures about the arts and live performances of music, theatre, and dance; take trips to visit museums; and view architecture. Students read relevant materials and write about each art work experienced. Special fee. 4 cr.

501/501H. Introduction to the Research Process
A) biological sciences; B) humanities; C) physical sciences; D) social sciences; E) theoretical/interdisciplinary. Examines how scholars ask questions and what methods they employ to gain answers. Cumulative GPA of 3.0 required. Permission. Cr/F. 2 cr.

510. McNair Introduction Seminar
Course assists newly inducted student scholars in understanding the requirements of participation. Substantive reading and writing on the life of Dr. Ron McNair as the springing point from which to understand program expectations and begin sketching research and graduate school goals. Prerequisite: Enrollment in McNair Scholars Program and permission. Cr/F. 1 to 2 cr.

530. Writing Consultation Across the Curriculum
This course provides the fundamental background for peer writing consultation serving as Writing Fellows across the curriculum. Emphasis is on the application of theoretical assumptions about writing, tutoring, and discipline-specific discourse. Restricted to members of the Writing Fellows Program. Faculty recommendation required. May be repeated for credit. Prerequisite: ENGL 401, one other Writing intensive course. 2 cr.

555. Peer Education
Students serve as co-instructors for a section of INCO 444, First Year Seminar. Under the supervision of the course coordinator and their co-instructor (a University faculty member or Student Affairs professional), they prepare and present materials and exercises for their section. With their co-instructor, they also grade written and other exercises. Students attend weekly meetings with their section co-instructor and biweekly meetings of all section instructors. They also attend a two day workshop on teaching and course facilitation prior to the semester and a one day workshop at the end of the semester. Prerequisite: permission. May be repeated. Cr/F. 1 to 3 cr.

585, 586. Foreign Exchange
Juniors and seniors may spend a semester or year in Canada at one of eleven colleges and universities in Nova Scotia or one of eighteen participating institutions in Québec. Possible disciplines include public relations, hospitality management, and computer science. Eligibility requirements include U.S. citizenship, junior or senior standing, and good academic achievement. For more information contact the Center for International Education. Cr/F. 1 to 16 cr.

590. Student Research Experience
Provides hands-on research experience to develop critical thinking, problem solving, and analytical skills. An entry-level research experience that introduces students to research theories, tools, and ethical issues. Each student completes a contract with a faculty mentor identifying the research activities the student will undertake. 1 to 4 cr.

595/595W. Winterim Topics
Concentrated interdisciplinary exposure to a particular culture or locale off campus during the winter term. Includes anthropological, artistic, biological, cultural, environmental, or geographical, historical, political, sociological, and other aspects of a culture, country or locale. May be repeated to a maximum of 8 credits. 595W is writing intensive. 1 to 4 cr.
596. Summer Topics
Provides a concentrated interdisciplinary exposure to a particular culture or locale off campus during the summer session. Includes anthropological, artistic, biological, cultural, environmental, geographical, historical, political, sociological, and other aspects of a culture, country or locale. May be repeated to 8 credits. 1 to 4 cr.

604H. Honors Senior Thesis
Final requirement for graduation with University Honors. Intended for honors students in majors that do not offer honors work. Open by special permission to other honors students. May be repeated for a maximum of 8 credits. IA (continuous grading). Writing intensive. 4 or 8 cr.

610. Research Inquiry Seminar
With the notion of understanding self as the basis for investigating the world, this seminar focuses on exploring elementary concepts of academic research. Students are engaged in identifying strengths, discovering their passions, discerning the joys and frustrations of research, and developing a sketch of a research project. Prereq: Enrollment in McNair Scholars Program and permission. Cr/F. 1 to 2 cr.

650/650H. Study Abroad Seminar: Encountering Oneself/Encountering the World
This seminar, which meets during the second half of each semester, seeks to prepare outgoing students for the Study Abroad experience. The course specifically engages the ways in which the international experience affects personal, academic, and career perspectives. Readings, discussions, and short written assignments will focus on cultural adaptation, cross-cultural communication, practical skills for international living, and especially the implications of global perspectives on a student's major field(s) of study. Students are strongly encouraged to take INCO 651: Studying Abroad/Returning Home in the first half of the semester in which they return to UNH. Permission required. Cr/F. 1 cr.

651/651H. Study Abroad Seminar: Returning Home
This seminar, which meets during the first half of each semester, offers returning students an opportunity to reflect on their Study Abroad experience. The course specifically engages the ways in which the international experience affects personal, academic, and career perspectives. Readings, discussions, and short written assignments will focus on the experience of re-entry: cultural (re)adaptation, cross-cultural communication, and especially the implications of global perspectives on a student's major field(s) of study. Students should expect to have taken INCO 650: Encountering Oneself/Encountering the World in the second half of the semester before they left UNH. Permission required. Cr/F. 1 cr.

655, 656. London Program
Enables students to pursue a semester or academic year of in UNH's programs in London, England. Students must be admitted before enrolling in the course. For information and application forms, consult program secretary, 53 Hamilton Smith Hall. Special fee. IA (continuous grading) grade will be assigned until official transcript is received. Program fee. Cr/F. 1 to 18 cr.

657. Justice Studies Budapest Program
This program is designed to introduce students interested in the field to a broader appreciation of the cross-cultural perspective. Each fall, fifteen UNH students spend the semester in residence at the Budapest University of Economic Sciences in Budapest, Hungary, where they have an opportunity to witness first hand the evolution of a criminal justice system within a context of significant cultural, political, economic, and social change. Situated along the Danube in one of Europe's oldest cities, the program offers a unique educational experience to students interested in the study of criminology, law and society, and the administration of justice. Under the supervision of a UNH faculty member also in residence, students carry a four course load, two of which are taught by the UNH faculty member. All courses are taught in English. Eligible students must hold sophomore standing, have completed either SOC 515 or POLT 507 and one other course in the Justice Studies curriculum, and have a minimum cumulative grade point average of 2.50. Coreq: JUS 650, 651 Special fee. Cr/F 6 cr.

685, 686. Study Abroad
Enables students to pursue a semester, summer, or an academic year of foreign study in programs other than those offered by UNH. Students must provide the University Committee on Study Abroad with detailed information about the curriculum and must receive approval from that committee before registration. Credit awarded only upon successful completion of the course of study and after receipt by the committee of an official transcript. Interested students should consult the Center for International Education. Prereq: permission. Special fee. (Financial aid requires a minimum of 6 credits.) Cr/F. 4 to 16 cr.

698. Summer Research Project
Guided independent research or student/faculty collaborative research. Open to recipients of summer undergraduate research fellowships or by permission of the Undergraduate Research Opportunities Program. (Summer only.) Cr/F. 8 cr.

699. McNair Summer Internship
McNair Fellows; not graded; Summer only.

710. Introduction to Research Methods
An introduction to methods and techniques of research study in the social sciences, mathematics and natural sciences, and the humanities. Concepts are tailored to students' research thesis. Students design and construct a research project (execution of project may be allowed for additional credit). A comprehensive written proposal is required. Prereq: Enrollment in McNair Scholars Program. 2 to 4 cr.

720. McNair Research Experience
This independent study course allows students to work one-on-one with a faculty scholar to execute the research project. The course also provides a forum for faculty mentors and research supervisors to troubleshoot challenges and assist in the completion of the project. Prereq: Enrollment in McNair Scholars Program. Permission required. 2 to 4 cr.

730. Writing Consultation Across the Curriculum
This course provides the fundamental background for peer serving as Writing Fellows in courses across the curriculum. Emphasis is on the application of theoretical assumptions about writing, tutoring, and discipline-specific discourse. Restricted to members of the Writing Fellows Program. Faculty recommendation required. May be repeated for credit. Students will be asked to evaluate their discipline-specific writing experience and apply it to their Writing Fellows' work. Prereq: ENGL 401, one other writing intensive course. 2 cr.

796. Touching the Limits of Knowledge: Cosmology and Our View of the World
A seminar analyzing the paradoxes and limits of scientific knowledge and religious understanding, their compatibility or lack of it with respect to contemporary cosmology. 1 cr.

International Affairs (IA)
(For program description, see page 111.)

401. International Perspectives: Science, Business, and Politics
Examination of the interaction of developments in science, economics, and politics as they shape international affairs. Topics include science and technology; world trade and investment; politics, cultural values, and ethics in world affairs. Team-taught, modular course. Prereq: permission; IA major. Writing intensive. 4 cr.

501. Global Issues in International Affairs
Introduce students to the various relationships among peoples, states, and cultures within a global environment. While built upon the general knowledge acquired in IA 401, IA 501 provides more in-depth study of particular issues involving a variety of regions of the globe. This course is essential to preparing students for study abroad and to equip them to conceptualize suitable research topics for IA 701. Each student will be expected to put substantial time into developing the reading, research, and analytical skills necessary for the study of international affairs. Prereq: IA 401. Writing intensive. 4 cr.

599. Special Topics
Subjects vary. Course descriptions are available at the Center for International Education. Some seminars, this course will satisfy specific requirements for the dual major in international affairs. For specific information in a particular semester, contact the Center for International Education. 4 cr.

695. Internship
Designed to provide research and work opportunities with an international aspect to UNH undergraduates. Internships may involve either research with a faculty member or work with an employer. Prereq: permission. May be repeated up to 8 credit hours. Cr/F. 2 to 4 cr.

699. Topics
Special topics course with varying subject matter and format. Study of areas and subjects not covered by existing courses. Center for International Education provides information on current offerings. Recommended as a dual major elective. 4 cr.

701. Seminar
Capstone of the dual major in international affairs. To be taken after completion of the foreign language and foreign experience requirements. Strong emphasis on research and analysis, use of foreign language skills, writing, and criticism. Prereq: IA 501; IA major. Writing intensive. 4 cr.
ITALIAN (ITAL)
(For program description, see page 42.)
401–402. Elementary Italian
For students without previous training in Italian. Aural comprehension, speaking, writing, reading. Labs. (No credit for students who have had two or more years of Italian in secondary school; however, any such students whose studies of Italian have been interrupted for seven years should consult the section coordinator about possibly receiving credit.) Special fee. 4 cr.

425. Introduction to Italian Studies
Designed for students interested in exploring Italian language and culture. Culture learning by means of guest speakers and visuals. Prepares for ITAL 401–402. Taught in English. Does not satisfy foreign language proficiency requirement. Special fee. (Offered summers only, Not offered every summer.) Writing intensive. 4 cr.

500. Selected Topics in World Literature
Topics will be chosen which introduce students to major themes and genres. (Also offered as CLAS 500, FREN 500, GERM 500, PORT 500, RUSS 500, SPAN 500.) May be repeated for credit. Credit/Fail. Writing intensive. 4 cr.

503–504. Intermediate Italian
A complete review of the fundamentals of grammar and syntax. Selected readings as a general introduction to Italian civilization and culture. Labs and films. Special fee. Writing intensive. 4 cr.

521. Italian Literature in Translation, 13th–16th Centuries
Major works of fiction and nonfiction, reflecting ideas and taste during the first three centuries of Italian history. Readings, discussions, papers in English. No more than one course in Italian may be counted toward the minor. Special fee. (Not offered every year.) Writing intensive. 4 cr.

522. Italian Literature in Translation, 18th–20th Centuries
Major trends in post-Renaissance thought and culture in Italy. Readings, discussions, papers in English. No more one course in English may be counted toward the minor. Special fee. (Not offered every year.) Writing intensive. 4 cr.

525. Italian Cinema
Acquaints students with major Italian film texts. Through cinema the course explores the culture, society, history, and politics of Italy. Students examine filmmakers, genres, periods, and movements. The course is conducted in English. Special fee. 4 cr.

595. Practicum
Practical use of Italian language and culture through special projects outside the classroom. May be repeated for a maximum of 4 credits. Prereq: permission. Cr/F. 2 cr.

595A. Practicum
Practical use of Italian language and culture through special projects outside the classroom. The Practicum consists of unpaid placement in an approved business, social service, or educational organization in an Italian-speaking context with on-site supervision. The course also includes a classroom component that incorporates readings and assignments pertinent to the Practicum experience. May be repeated for a maximum of 4 credits. Permission. Letter Grade. 2 or 4 cr.

631. Advanced Italian Conversation and Composition
Rapid review of basic grammatical structures and in-depth study of more complex linguistic patterns. Vocabulary building. Frequent written compositions and oral presentations using materials on contemporary culture taken from the various media. Phonetics and oral/aural skills development in lab and class. Prereq: C or better in ITAL 504 or permission. Special fee. Writing intensive. 4 cr.

632. Advanced Italian Conversation and Composition
Advanced spoken and written Italian to attain aural-oral fluency. Advanced reading and composition. Prereq: C or better in ITAL 631 or permission. Special fee. Writing intensive. 4 cr.

651. Introduction to Italian Culture and Civilization I: Middle Ages, Renaissance, Baroque
Survey of major representative writers and artists, studied against the backdrop of social and cultural history. Dante, Petrarch, Boccaccio, Machiavelli, Marino. Prereq or Coreq: ITAL 631 or permission. Special fee. (Not offered every year.) Writing intensive. 4 cr.

652. Introduction to Italian Culture and Civilization II: Age of Enlightenment, Romanticism, Modernism
Survey of major representative writers and artists, studied against a backdrop of social and cultural history. Parini, Goldoni, Leopardi, Manzoni, Pavese, Calvino. Prereq or Coreq: ITAL 631 or permission. Special fee. (Not offered every year.) Writing intensive. 4 cr.

681A, 681B. Interdisciplinary Field Seminar in Italian Culture: Ancient and Medieval Italy
Taking an interdisciplinary, but historically centered perspective, this course examines the construction of Italy as both a nation and a culture. The course is conducted on site and includes several fieldtrips throughout Italy. Coreq: ARTS 695L. 4 cr.

682A, 682B. Interdisciplinary Field Seminar in Italian Culture: Early Modern and Contemporary Italy
Taking an interdisciplinary, but historically centered perspective, this course examines the construction of Italy as both a nation and a culture. The course is conducted on site and includes several fieldtrips throughout Italy. Coreq: ARTS 695L. 4 cr.

684. UNH-in-Italy Summer Program
UNH-in-Italy Summer Program in Ascoli Piceno. This course number is a placeholder, but differs with regard to the special fee. Students register for both this administrative course number and the actual course being offered on site. These courses will vary from year to year, but the special fee will remain constant. Permission required. Coreq: ARTS 695L, ARTS 996. Special fee.

685, 686. UNH-in-Italy Study Abroad
Provides a unique opportunity to study abroad in Ascoli Piceno, Italy during the fall semester. Special fee.

733. History and Development of the Italian Language
Development of the Italian language from Roman times to the present. Examines the comparative method and internal reconstruction as well as processes of changes in phonology, syntax and lexicon. The course introduces issues in dialect geography, the basic features of paleography and surveys the evolution of scripts. Prereq: ITAL 631 or above or permission of instructor. Special fee. 4 cr.

Japanese (JPN)
(For program description, see page 42.)
401–402. Elementary Japanese
Elements of Japanese grammar. Oral practice and written drills designed to achieve a mastery of basic grammatical patterns. Reading of graded exercises introducing the student to written Japanese (Hiragana and Katakana) and Chinese characters used in contemporary Japan. Labs. (No credit for students who have had two or more years of Japanese in secondary school; however, any such students whose studies of Japanese have been interrupted for a significant period of time should consult with the department chairperson about possibly receiving credit.) Special fee. 4 cr.

425/425H. Introduction to Japanese Culture and Civilization
Taught in English and designed for students interested in exploring Japanese culture and society. Learning by means of lectures, discussions, guest speakers, selected readings, and multimedia. Does not fulfill B.A. foreign language requirement, but does fulfill the Group 5 foreign culture general education requirement. Also counts toward the Asian Studies Minor. Special fee. Writing intensive. 4 cr.

503–504. Intermediate Japanese
Review of Japanese grammar. Reading of prose and practice in oral and written expression. Labs. Prereq: JPN 402 with a grade of C (2.00) or better or permission of instructor. Special fee. 4 cr.

631–632. Advanced Japanese
Advanced spoken and written Japanese to attain aural-oral fluency. Advanced reading and composition. Prereq: JPN 504 or a grade of C or better or permission of instructor. Special fee. 4 cr.

795, 796. Independent Study
Open to highly qualified juniors and seniors. To be elected only with the permission of department chairperson and of the supervising faculty member or members. Barring duplication of subject, may be repeated for credit. 1 to 4 cr.

Justice Studies (JUST)
(For program description, see page 39.)
401. Introduction to Justice Studies
Overview of justice studies as the study of law and law-like systems. Includes literature from both the law and society, and criminology. Topics will include morality versus legality, the American legal civil and criminal system, torts, and adult versus juvenile justice. 4 cr.
501. Research Methods
Overview of the various methodologies used in justice studies research: quantitative, qualitative, and legal. Topics include issues of design such as ethics, reliability, and validity measurement. Students will design and write up research proposals using one of the methods reviewed in the course. Prereq: PSYC 402 or SOC 502 or equivalent. Special fee. 4 cr.

550-551. Mock Trial
Participation in American Mock Trial Association intercollegiate competition. Study and preparation for trial of national case (criminal or civil, alternate years). Year-long course, 2 credit hours per semester. Special fee. Permission required. 2 cr.

601. Internship
Placement by the justice studies coordinator in a position related to the justice system (e.g., criminal courts, corrections, civil courts, law firms, policy-making agencies, law enforcement agencies); weekly class meetings. Prereq: permission; seniors only. 4 cr.

602. Research Internship
Independent research working with Justice Studies faculty on their projects. Includes working with faculty at such research centers as Crimes Against Children, Family Research Lab, and Justiceworks. Student/supervisor contract required. Minimum time commitment: 12 hours per week. Prereq: JUST 401, 501; for permission. 4 cr.

650. Special Studies in Comparative Justice Systems
This course will involve periodic offerings in comparative analysis of justice systems in an international context. May be repeated for a total of 8 credits provided both course offerings are substantially different. Must be taken with JUST 651 for those students participating in the Justice Studies Budapest Program. Prereq: POLT 507 and/or SOC 515. Coreq: INCO 657, JUST 651. 4 cr.

651. Field Studies in the Hungarian Justice System
This course is designed to provide Justice Studies Budapest Program students with first-hand experience with the workings of the Hungarian justice system. Weekly field trips to agencies in law enforcement, the courts, and correctional facilities in the Budapest area will be arranged, and periodic lectures by Hungarian criminal justice professionals and scholars will complement these visits. Must be taken with JUST 650 for those students participating in the Justice Studies Budapest Program. Prereq: POLT 507 and/or SOC 515. Coreq: INCO 657, JUST 650. 6 cr.

695. Special Topics
Special topics of advanced study in Justice Studies. Selected offerings reflect faculty expertise in teaching and research. May be repeated in different topic areas. Prereq: SOC 515 or POLT 507 and one other Justice Studies course. Must hold sophomore standing or above. 4 cr.

701. Senior Seminar
Advanced material in which the instructor has specialized knowledge through research and study. Topics may include the death penalty, terrorism, psychology of the jury, ethics and morality, immigration, therapeutic jurisprudence, and juveniles tried as adults. Prereq: JUST 401, 501. 4 cr.

765/765W. Special Topics
New or specialized courses are presented under this listing. Staff present material not normally covered by the course offerings. Cross-listed courses. May be repeated but not duplicate content. 765W is writing intensive. 4 cr.

767. Students, Teachers, and the Law
Explores how the law impacts the educational lives of students and teachers. Topics include church-state relations, free speech, dress codes, and search and seizure. (Also offered as EDUC 767.) 4 cr.

795. Reading and Research
An independent study that is arranged by the student and supervised by a Justice Studies faculty member. Course requirements include: assembling and reading a substantial bibliography in the field; completing several written assignments and in some cases participating in hands-on experiences such as data collection and analysis. This course is by permission only and requires a signed agreement/proposal prior to registration. May be taken for 1-4 credits and includes a minimum of 3 hours of coursework per week per credit hour. Writing intensive in some cases. 1 to 4 cr.

Kinesiology (KIN)
(For program description, see page 77.)

444A. Risk and the Human Experience
Explores the construct of risk in two phases: 1) knowledge building, focusing on the historical development of risk and its current manifestations in contemporary society; and 2) knowledge application, which focuses on applying conceptions of risk to various case study examples. The second phase of the course employs a problem-based learning approach with four distinct modules that ask students to apply, experience, and evaluate risk in a variety of contexts. Each module includes: a) case study description, b) an experiential exercise, and c) a collaborative debriefing of the experience and reflective application to broader societal issues. 4 cr.

444B. Coolest Game? Hockey and History
This course uses hockey as a vehicle for exploration and practice in three critical processes of scholarship: 1) analyzing and framing questions, 2) employing different methods/sources for pursuing answers to the questions, 3) presenting the results of research. Research exercises, discussions, and papers consider hockey’s development in larger social and cultural contexts/practices such as ethnicity, nationalism, technology, mass media and marketing, gender relations, labor relations, and regionalism. The course also looks at hockey as a medium of craft, hero formation, community, and collective violence. Students read and analyze interdisciplinary articles and books, and also work with a range of historical sources, including those in the UNH Archives and the Charles Holt Archives of American Hockey. Writing intensive. 4 cr.

500. Historical and Contemporary Issues in Physical Education
Physical education is discussed in historical and philosophical terms to lay the foundation for later of recent issues and trends within the field. Open to KIN students in the pedagogy option, undeclared HHS students, and undeclared liberal arts students. Prereq: KIN Physical Education Pedagogy or department approval. 4 cr.

501. First Aid: Responding to Emergencies
Covers the nationally accredited American National Red Cross First Aid—Responding to Emergencies and BLS-CPR professional rescuer course. May not repeat for credit. Special fee. Cr/F. 2 cr.

505. Prevention and Care of Athletic Injuries
A primer in athletic injury, care, prevention and rehabilitation, specifically designed for anyone involved in sports or exercise either as a coach, personal trainer, exercise physiologist, first- aider or participant. Topics to be covered include general conditioning, bone, muscular and ligamentous anatomy of the trunk and extremities, head trauma, emergency care, the injury process, thermal conditions, nutritional considerations and the diabetic and asthmatic athlete. Special fee. 4 cr.

506. Concepts of Athletic Training for the Professional
Introduces techniques for prevention, recognition, treatment, and rehabilitation of common athletic injuries. Course is a prerequisite for beginning clinical experience in athletic training rooms for the athletic training professional. Prereq: ZOOL 507. Coreq: KIN 507. 4 cr.

507. Concepts of Athletic Training Lab
Theory and techniques of protective taping and wrapping to prevent common athletic injuries. Techniques of transfer and transportation of injured athletes. Identification of anatomical landmarks. Observation and practice in the University athletic training rooms. Special fee. Coreq: KIN 506. 1 cr.

521. Theory of Coaching Basketball
Individual and team offense and defense; rules of the game. Problems in team handling and conditioning. Prereq: permission. Pre- or Coreq: KIN 565. 2 cr.

523. Theory of Coaching Hockey
Basic hockey skills. Fundamentals of individual and team offense and defense; coaching methods; rules. Prereq: student must have basic skating skills prior to taking course. Pre- or Coreq: KIN 565. Special fee. 2 cr.

527. Scientific Foundations of Health and Fitness
Provides students with practical, scientific, entry-level information relative to physical conditioning, health, and wellness from childhood through adulthood. Students are given theoretical information that will be followed by practical, hands-on experiences offered through laboratory experiences. Special fee. Writing intensive. 4 cr.

528. Theory of Coaching Track and Field
Starting, sprinting, middle-distance and distance running, relay, hurdling, high and broad jumping, pole vault, shot putting, discus, hammer, and javelin methods of training and practicing. Prereq: permission. Pre- or Coreq: KIN 565. 2 cr.

533. Basic Scuba
Full semester in the fundamentals of scuba diving. Through a progressive series of classroom lectures and pool sessions, students gain the knowledge and skill necessary to conduct themselves with competence underwater. Emphasizes safety and problem prevention. Once the students are ready, further training takes place in an open ocean environment. NAUI Certification for successful completion of all course requirements and at least five open-water dives. Strong swimming ability required. Special fee. Lab. Cr/F. 3 cr.
540. Top Rope Rock Climbing
Provides students with an understanding of the equipment, techniques, and procedures necessary to safely set up and manage top rope rock climbing and rappelling sites. Specific topics include: anchor construction, belay methods, climbing technique, and site selection and management. Prereq: KIN: OE major. Special fee. Lab. 3 cr.

541. Management of Initiatives and Challenge Courses
Management of adventure initiatives and challenge courses as an educational and therapeutic medium with a variety of populations. Focuses on skill development, processing techniques, rescue skills, evaluation techniques, and applications to specific client groups. Prereq: KIN: OE major. Special fee. Lab. 4 cr.

543. Winter Backpacking Skills
Provides students with the skills necessary to perform self and group rescues in a variety of steep terrain and high angle environments. Specific topics include knots for rescue, rope ascension, assisted/counterbalance rappelling, aid climbing, haul systems, and litter lowering and raising in vertical environments. Prereq: KIN: OE major, KIN 547, or equivalent experience. Special fee. Lab. 2 cr.

546. White Water Canoeing
Introduces white water canoeing skills. Students gain a basic understanding of the equipment, techniques, and procedures to conduct canoeing activities in flat water, moving water, and white water environments. Emphasizes development of individual paddling skills, safe and conscientious paddling, and group management on moving water and white water. Prereq: KIN: OE major, KIN 551. Special fee. Lab. 3 cr.

547. Lead Rock Climbing
Advanced climbing course designed to provide students with a structured environment to transition from top rope rock climbing or sport climbing to multi-pitch traditional lead climbing. Focuses on the development of the technical skills and judgment associated with leading in a multi-pitch environment. Specific topics include use of artificial protection, belay anchor construction, multipitch rappelling, knots, rope/belay station management, climbing technique, and multipitch leading considerations. Prereq: KIN: OE major, instructor permission. Special fee. Lab. 3 cr.

548. High Altitude Mountaineering
Introduces mountaineering and alpine climbing skills. Students develop an understanding of glacier travel, snow and ice climbing, hazard evaluation, crevasse rescue, mountain weather and altitude considerations, and leadership in mountain environments. Prereq: KIN: OE major, instructor permission. Special fee. 4 cr.

550. Outdoor Education Philosophy and Methods
Explores the philosophical basis for experiential and outdoor education. Experiential exercises and readings focus on the role of risk, traditional versus progressive education, role of nature, ethics, models of learning and facilitation, and developing a personal philosophy of outdoor education. Includes full-day outdoor education laboratory experiences. Special fee. Writing intensive. 4 cr.

551. Adventure Programming: Backcountry Based Experiences
Introduces the leadership of land-based backpacking programs. Students develop an understanding of backpacking equipment, trip planning and organization, instruction of basic camping skills, implementation of safety procedures and group management on backpacking trips. Prereq: KIN: OE major. Special fee. Lab. 3 cr.

552. Adventure Programming: Water Based Experiences
Introduces the leadership of canoe expeditions. Students develop an understanding of necessary canoeing equipment, trip planning and organization, instruction of basic canoeing strokes, implementation of safety procedures, and group management on canoe expeditions. Prereq: KIN: OE major, KIN 551. Special fee. Lab. 3 cr.

560. Sport Psychology
Introduction to the discipline of sport psychology. Explores behavioral, cognitive, and social psychology in relation to elite, collegiate, and high school athletes, as well as recreational sport participants. Permission required. 4 cr.

561/561W. History of American Sport and Physical Culture
Major individuals, organizations, and trends that influenced the development of an American industry in sports, active recreation, and physical fitness. Readings, discussions, and research projects provide experience in the craft and utility of history. 4 cr.

562. Introduction to Sports Information
Basic concepts of sports information related to preparation of material for public relations including radio, television, and publications. Includes guest lecturers and work in the UNH Sports Information Office. 4 cr.

565. Principles of Coaching
Overviews current theory and practice in coaching education, including sport pedagogy, physiology, psychology, administration, and risk management. Issues of performance and competition specific to child, youth, and collegiate coaching are addressed. 4 cr.

570. Elementary Physical Education Practicum
Provides opportunities for developing and refining elementary and special physical education movement content with pedagogical processes. Emphasizes demonstrating competence in teaching and establishing a least-restrictive learning environment. Prereq: KIN 610; KIN: PE Pedagogy major. Writing intensive. 4 cr.

580. Sport Industry
Overviews the various segments that make up the sport industry, including governing bodies, the mass media, sporting goods firms, players' and coaches' associations, public regulatory agencies, and secondary and higher education. Readings and discussions consider the development and structure of each segment, interaction between segments, legal issues, and policy implications. While the course will focus on the United States, there is some comparison to other countries. 4 cr.

585. Emergency First Responder
Standards of practice that conform to the content of the U.S. Department of Transportation curriculum for First Responder. Initial evaluation and stabilization of patients at the scene of medical emergencies, CPR, and other basic medical care for illness and injury. Prepares the student for the New Hampshire First Responder Certification Examination. Prereq: KIN: Athletic Training; KIN: Exercise Science; HHS: undeclared. Lab. Special fee. 4 cr.

600. Movement and Gymnastics Exploration
Combines the elements of movement education and gymnastics progressions to develop a basis for teaching. Emphasizes and demonstrates efficient and safe movement and gymnastics skills in a variety of settings. Includes fundamental movement elements, movement skills, fundamental gymnastics skills, and fundamental gymnastics spotting skills. 4 cr.

601. Lifetime Sports
Provides teachers with the technical knowledge as well as the psychomotor and pedagogical skills necessary for instructing lifetime activities, including tennis and badminton. Prereq: KIN: PE Pedagogy major. Special fee. 3 cr.

603. Team Sports
Provides teachers with the technical, physical, and pedagogical skills necessary for instructing team sports, including soccer and volleyball. Prereq: KIN: PE Pedagogy major. 3 cr.

607. Biology of Aging
Biological mechanisms of the aging process, with special emphasis on human aging; changes due to chronic disease. 4 cr.

610. Elementary Physical Education Pedagogy
Planning, implementing, and evaluating a movement-based curricular model of instruction relative to teaching preschool and elementary-aged children physical education. Systematic observation, teaching, strategies and styles, lesson design, and methods of integrating academic subject matter into elementary physical education. Prereq: KIN: PE Pedagogy major; KIN 600, 675. 4 cr.

620. Physiology of Exercise
Acute and chronic effects of exercise. Muscle physiology, respiration, cardiac function, circulation, energy metabolism, and application to training. Prereq: ZOOL 507-508. 4 cr.

621. Exercise Laboratory Techniques
Laboratory assessment of functional capacity, body composition, anaerobic power, anaerobic threshold, pulmonary function, blood pressure control, muscle strength, and temperature regulation. Field tests are used where appropriate. Extensive out-of-class time is required as each week a detailed lab report is submitted for grading. Prereq: KIN 620; KIN: Exercise Science major. Special fee. Writing intensive. 4 cr.

648. Current Issues in Health
Designed to assist students in their understanding of issues related to health and health education. 4 cr.

650A. Internship in Exercise Science
Experiential learning in an agency that offers physical activity programs of prevention, intervention, and rehabilitation. An 8 credit internship requires a minimum of 600 hours experience. Activities include graded exercise testing, exercise prescription, and exercise leadership. Must have completed all requirements for the option. May be repeated up to a maximum of 12 credits, with no more than 8 credits taken in any given semester. Cr/F. 2 to 8 cr.
650B. Internship in Outdoor Education
Experiential learning in a setting appropriate to the major option and to student's objectives. An 8 credit internship requires a minimum of 600 hours experience; fewer credits will require proportionally fewer hours. Outdoor Education: Provides an appropriate transition from undergraduate education and future employment in the field of outdoor education. Generally done after students have completed all other requirements for the option. Prerequisite: junior/senior major; permission. Cr/F. May be repeated up to a maximum of 12 credits, with no more than 8 credits taken in any given semester. 1 to 8 cr.

650C. Internship in Sport Studies
Experiential learning in a setting appropriate to the major option and to student's objectives. An 8 credit internship requires a minimum of 600 hours experience; fewer credits will require proportionally fewer hours. Sport Studies: May be on- or off-campus with an approved organization. Student must participate in securing the internship. A journal, bi-weekly reports and a final paper required. Prerequisite: junior/senior major; permission. May be repeated up to a maximum of 12 credits, with no more than 8 credits taken in any given semester. 1 to 8 cr.

650D. Internship in Coaching
Experiential learning in a setting appropriate to student's learning objectives in coaching. May be on- or off-campus with an approved organization. Student must participate in securing the assistantship. A journal, bi-weekly reports, and final report required. Prerequisite: KIN 505, 565. 2 to 4 cr.

652. Clinical Kinesiology
The science of human movement from biomechanical, neuromuscular, and anatomical perspectives; human muscular, joint, and connective tissue anatomy; and actions of skeletal muscles are detailed. Prerequisite: HHS major; ZOOL 507-508. Corequisite: KIN 653A or 653B. 4 cr.

653A. Musculoskeletal Assessment
Principles and methodology of joint range of motion, body mechanics, and muscle strength evaluation. Uses muscle palpation, goniometry, manual muscle testing, hand-held dynamometry, electromyography, and fluoroscopy to facilitate understanding of musculoskeletal anatomy and assessment. Special fee. Prerequisite: ZOOL 507-508. Corequisite: KIN 652. 2 cr.

653B. Biomechanical Analysis of Movement
Principles and methodology of analyzing posture and movement. Uses muscle palpation and testing, electromyography, and cinematography to facilitate students' understanding of movement analysis. Special fee. Prerequisite: ZOOL 507-508. 2 cr.

655. Middle School and Secondary Physical Education Pedagogy
Planning, implementing, and evaluating curricular models of instruction, as well as effective teaching strategies and styles relevant to secondary (grades 6-12) physical education is studied. Content and process knowledge is applied through micro-teaching episodes with peers. Systematic observation is introduced for the purpose of reflecting on teaching behaviors. Prerequisite: EDUC 500, Lab. 4 cr.

658. Evaluation and Care of Athletic Training I

658L. Evaluation and Care of Athletic Training Injury Lab
Techniques and practice for performing test and assessment procedures for athletic injuries. Prerequisite: KIN 507. Corequisite: KIN 658. 1 cr.

659. Evaluation and Care of Athletic Training Injury II

659L. Evaluation and Care of Athletic Training Injury II Lab
Techniques and practice for performing test and assessment procedures for athletic injuries. Prerequisite: KIN 507. Corequisite: KIN 659. 1 cr.

660. Therapeutic Exercise in Athletic Training
Rationale, use, and application of exercise in athletic injury rehabilitation. Basic components of designing and implementing rehab programs. Assessment of physical/injury status. Prerequisite: KIN 652; 653A. Corequisite: KIN 661. 4 cr.

661. Therapeutic Exercise in Athletic Training Laboratory
Students learn and practice psychomotor techniques associated with rehabilitative and conditioning exercise. Prerequisite: KIN 660. 1 cr.

662. Therapeutic Modalities in Athletic Training
Rationale, use, and application of therapeutic modalities in athletic injury rehabilitation. Principles of electrophysics and biophysics. Physiological effects on body tissues, indications and contraindications, and clinical applications. Prerequisite: KIN 506; 507. Corequisite: KIN 663. 4 cr.

663. Therapeutic Modalities in Athletic Training Laboratory
Students use equipment to practice with the devices, machines, and techniques associated with the treatment and rehabilitation of athletic injuries. Corequisite: KIN 662. 1 cr.

665. Laboratory Practicum in Athletic Training

666. Middle School and Secondary Physical Education Practicum
Apply secondary content and process knowledge within microteaching experiences with peers. Students also teach grades 6 through 12 within the public school setting. Emphasizes lesson, unit plan design, and systematic observation. Prerequisite: KIN 563; KIN: PE Pedagogy major. Writing intensive. 4 cr.

667. Pharmacology for Athletic Training
Introduces the use of drugs as they pertain to the health care of athletes and their effect on athletic competition. Topics to be covered will include basic drug action, commonly prescribed medications, dealing with the diabetic and asthmatic athlete and performance enhancing substances. Prerequisite: junior or senior standing. 2 cr.

668. Ergogenic Aids in Sports
In sports, faster, higher, stronger, longer, and better is what everyone wants. Athletes and coaches seek out sports ergogenics that will give them a training and performance advantage over their competition. This course introduces the use of sports ergogenics and their use in athletic competition. Prerequisite: sophomore, junior or senior standing. 2 cr.

670. General Medical Conditions in Athletics
Athletes often sustain non-orthopedic pathologic conditions. An athletic trainer must be able to recognize, assess, and determine appropriate action or referral in an athlete suffering general or systemic illness or disease. Covers conditions affecting the major systems of the body. Prerequisite: KIN 620. 4 cr.

675. Motor Development and Learning
Characteristics of motor behavior across time, and the role of movement in children's and adolescents' total development. Growth processes, stage theory, as well as the relationship of maturation, experience, and the environment to motor development. Prerequisite: KIN 600; KIN: PE Pedagogy major; family studies major. 4 cr.

676. Adventure Activities
Provides teachers with the technical, physical, and teaching skills necessary to instruct adventure activities, initiatives, ropes course management, and orienteering. Prerequisite: KIN: PE Pedagogy major. Special fee. 3 cr.

681. Theory of Adventure Education
An in-depth investigation of the theories that underpin the professional practice of outdoor education. Students examine program applications in corporate, therapeutic, and educational settings, study advanced facilitation techniques, and analyze pertinent outdoor education research. Prerequisite: KIN: OE major, KIN 682. Special fee. Writing intensive. 4 cr.

682. Outdoor Leadership
Leadership theories applied through field experiences in adventure programming. Students will understand a variety of leadership, teaching, and communication styles, decision-making models, program planning and logistics, and risk management considerations for planning and delivering adventure programs. Prerequisite: KIN 541, 550, 551, 684, 685; KIN: OE major. Special fee. 4 cr.

684. Emergency Medical Care: Principles and Practices
Based on the curriculum established by the U.S. Department of Transportation for Emergency Technician (EMT-Basic), and authorized by the State of New Hampshire Bureau of Emergency Medical Services (EMS). Topics covered include cardiopulmonary resuscitation, environmental and psychiatric emergencies; childbirth; hazardous materials; and infection control procedures. Students participate in clinical observations in one of the region's...
hospital emergency departments. Students have the option to take the state of NJ-EMS Practical Examination and the National Registry Written Examination for EMT-Basics. Passage of these examinations leads to national certification as an EMT-Basic. Prereq: KIN 685. 3 cr.

685. Emergency Medical Care: Principles and Practices Lab
Basic emergency health care, including trauma patients, medical and environmental emergencies, and childbirth. Includes clinical experience with a local hospital and ambulance service. Prepares the student for the National Registry of EMT's examination. Prereq: department approval. Coreq: KIN 684. Special fee. 2 cr.

686. Wilderness Emergency Medical Care
Standards of practice for professionals providing emergency medical care in remote areas. Consideration of prolonged transport times, severe environments, and the use of portable and improvised equipment. Topics include wilderness trauma and illness, search and rescue operations, and environmental emergencies. Prereq: current EMT-Basic and CPR certifications; KIN: OE major. Special fee. 4 cr.

687. Leadership Practicum
Supervised semester-long experience working with an organization external to the university setting to plan, prepare, and implement outdoor education programs and activities. Class sessions involve advanced leadership topics (e.g., current issues in risk management, conflict resolution, social justice issues, adaptive programming). Prereq: KIN 682; KIN: OE major. Lab. 4 cr.

693. Teaching Assistantship
A) Physical Education Pedagogy; B) Exercise Leader; C) Outdoor Education; D) Science Labs; E) Cardiac Rehabilitation; F) Coaching. Students serve as teaching assistants in assigned class activities. Assignments to be made by the class instructor may include teaching assistants' and administrative duties. May take two different sections. May be repeated up to a maximum of 4 credits. Prereq: junior standing; departmental approval. Cr/F. 2 cr.

694. Supervised Teaching in Physical Education
Student teaching course is the culminating experience for students who wish to be certified to teach physical education upon completion of their senior year. Students must sign-up for both KIN 694 and EDUC 694. They will receive 4 credit hours for each. Permission required. Cr/F. 4 cr.

696. Independent Study
An advanced, individual scholarly project under the direct supervision of a faculty member. Prereq: junior or senior; departmental approval. May be repeated to a maximum of 8 credits. 2 to 4 cr.

699H. Honors Project
Project first involves tutorial sessions to introduce the student to the experimental design, after which a research question is developed. After an appropriate literature review, the student collects and analyzes data, forms conclusions, and prepares a written report on the findings. 4 cr.

704. Electrocardiography
Designed to provide exposure to basic interpretation and identification of electrocardiograms (ECGs). Includes detailed heart anatomy, coronary circulation, cardiac conduction system, electrocardiogram development, and all aspects pertaining to normal and abnormal ECGs. Prereq: KIN 621, KIN: Exercise Science major. 4 cr.

705. Topics in Applied Physiology
Advanced exercise physiology course dealing with topics both current and recent to exercise science majors. Includes genetics, environmental influences, immune system, detraining and overtraining, epidemiology, ergogenic acids, and the influence of age and gender. Prereq: KIN 620, 621. KIN: Exercise Science major. Special fee. Writing intensive. 4 cr.

706. Neurology
Development, morphology, internal configuration, physiology, function, and pathology of the human nervous system. Prereq: ZOOL 507-508 or equivalent. Coreq: KIN 707. Special fee. 4 cr.

707. Neurology Lab
Basic histology, neuroanatomy and neurophysiology of the human nervous system. Use of brain specimens, videos and pathology case studies to elucidate cell structure, sensory and motor systems, and spinal cord, brainstem and cortical organization and anatomy. Prereq: ZOOL 507-508 or COMM 521 or equivalent. Coreq: KIN 706. Special fee. Cr/F. 2 cr.

710. Organization and Administration of Athletic Training Programs
Principles of organization and administration of athletic training programs; management of personnel; legal aspects; relation of athletic trainer to athletic programs and sports medicine team. Writing intensive. 4 cr.

715. Seminar in Athletic Training
Career issues and specific topics in athletic training. Students are required to submit and present a term project on assigned topic. 4 cr.

718. Career Preparation in Athletic Training
Designed to provide the methods to integrate the knowledge and skills learned in prerequisite courses into practical applications as the students prepare to graduate. Advanced knowledge and skills are emphasized in the areas of evaluation, treatment, rehabilitation, and implementation of policies and procedures. Prereq: KIN 658, 659, 660, 662, 710, KIN: Athletic Training major. 4 cr.

720. Science and Practice of Strength Training
Designed to provide students exposure to the knowledge and practical experience necessary for establishing strength development programs in a variety of populations, including healthy, athletic, and higher risk individuals. Program design, correct lifting techniques, physiological adaptations, and organization and administration of programs are highlighted. Includes fundamentals regarding the selection of programs and equipment, spotting techniques, as well as ways to assess strength and power in humans without expensive equipment. Prereq: KIN 620. 4 cr.

724. Metabolic Adaptations to Exercise
Overview of the metabolic processes that occur during exercise and metabolic changes that occur as a result of exercise training. Topics include glycogenolysis and glycolysis in muscle, cellular oxidation of pyruvate, lipid metabolism, metabolism of proteins and amino acids, neural and endocrine control of metabolism, and fatigue during muscular exercise. Prereq: KIN 620; CHEM 404; KIN: Exercise Science major. Special fee. 4 cr.

730. Research Diving Techniques
Takes previously certified divers with the need to assist, or conduct research underwater, and trains them in the methods and specific techniques of scientific diving programs. Progressively builds upon the basic diving skills until the student is knowledgeable and competent. Culminates with a small research project formulated and implemented by the students. Prereq: SCUBA certification, department approval. Special fee. (Also offered as ZOOL 730.) 4 cr.

735. Advanced Scuba
Classroom, pool, and open-water "hands-on" application in advanced diving techniques. The student's diving ability progresses to become safer and highly educated in a variety of diving disciplines. Topics covered include navigation, search and recovery, low-visibility/night diving, surface supplied diving, boat diving, accident management hyperbaric medicine, and physiology and scientific research methods for divers. Special fee. Lab. 4 cr.

736. Fitness and Graded Exercise Testing
Designed to provide students exposure to the knowledge and practical experience necessary for establishing exercise programs in apparently healthy populations. Topics include fitness testing, test interpretation, and exercise prescription. Prereq: KIN 704, KIN Exercise Science major. Special fee. 4 cr.

737. Exercise Prescription and Leadership
Provides exposure to the knowledge and practical experience necessary for establishing exercise and health promotion programs in a variety of populations. Includes fundamentals regarding personal training and program selection, implementation and equipment, legal issues, and budget establishment. Strength training programs and special populations are highlighted. Prereq: KIN 736; KIN: Exercise Science major. 4 cr.

740. Athletic Administration
Introduces basic management components and processes used in the successful administration of school and college athletic programs. Topics include planning, organizing, and managing sports programs, personnel, and policies; game scheduling; finances and facilities; equipment and event management; student support services; and legal issues. Prereq: permission. 4 cr.

741. Social Issues in Contemporary Sports
Investigation of interrelationships among sport, culture, and society in an attempt to understand the role and function of sport in contemporary society. Overview of selected sociocultural factors that influence and result from participation in sports. Prereq: MKTG 530 or permission. 4 cr.

743. Sport Marketing
Survey of concepts and processes used in the successful marketing of sport programs and events. Special emphasis on the unique or unusual aspects of sport products, markets, and consumers. Prereq: MKTG 530 or permission. 4 cr.

750. Theories of Motivation in Sport and Exercise
Social cognitive theories of achievement motivation as they relate to sport and exercise participation. Special attention will be directed at social interactions in sport. Prereq: PSYC 401; permission. 4 cr.

761. Senior Seminar Sport Studies
Discussions of sport studies topics, such as gambling, aggression, media, gender, race, class. Students consider different disciplinary approaches to these topics and develop projects to advance knowledge related to their interests. Prereq: KIN: Sport Science major. Students must accumulate an aggregate total of 150 hours of work (paid or unpaid) in four approved sport organizations before they are allowed to register for KIN 761. Writing intensive. 4 cr.
#770. Psychological Skills in Performance
Provides essential elements of psychological skills training in performance. Focuses on mental aspects that enhance or inhibit physical performance. Theory, direct skill acquisition, and skill application are all integral to this course. Topics include progressive relaxation, meditation, hypnotism, goal setting, and stress inoculation testing. Special fee. Prereq: PSYC 401 or KIN 780. 4 cr.

780. Psychological Factors in Sport
Factors of outstanding athletic achievement; psychological variables in competition; the actions and interactions of sport, spectator, and athlete. Special attention directed to strategies for coaches, teachers, and athletic trainers to utilize sport psychology in their professional practice. Prereq: PSYC 401 or KIN 761. 4 cr.

781. Inclusion in Physical Education
Overview of special physical education. Addresses modifying instruction, expectations, and learning environment to accommodate physical and motor behaviors of students with disabilities. Prereq: KIN: PE Pedagogy major. Lab. Writing intensive. 4 cr.

786. Organization and Administration of Outdoor Education
Study of administration of outdoor education programs using a variety of organizational models. Students develop and, through simulated experiences, manage a program. Field experience. Special fee. KIN: OE major. Writing intensive. 4 cr.

794. Cardiopulmonary Pathologies
Lecture study of the anatomy, physiology, and pathophysiology of the cardiac, vascular, and pulmonary systems. Particular emphasis on the study of cardiovascular function in diseased and stressed states. Clinical assessment of the cardiopulmonary patient. Prereq: KIN 704. 4 cr.

795. Practicum in Cardiac Rehabilitation
Provides students with practical and theoretical experience in all aspects involving cardiac rehabilitation programs. Prereq: KIN 704, 794. 2 cr.

798. Special Topics
New or specialized courses not normally covered in regular course offerings. May be repeated up to 8 credits. Prereq: departmental approval. Special fee on some sections. 1 to 4 cr.

444. Walls: Mortar and Metaphor
Introduces the critical habits and skills of inquiry-based learning. As a General Education 8 course in Literature and Ideas it focuses on the wall as a "concrete" aspect of everyday material culture and as a metaphorical site of cultural and ideological definition, experience, memory and expression in diverse contexts. Students keep a journal, write a research paper in multiple drafts and write a final essay. Writing intensive. 4 cr.

444A. Love and Nation in German Film
In this course, we look at German films from the early Weimar period to the present. Our main question is: What connections exist between love stories and the creation of national identity in films from different periods of German history? We learn to read films as an aesthetic text with a narrative and form and as an historical text with a social and political function. Special fee. Writing intensive. 4 cr.

444B. France and the European Union in a Global World
Encourages students in their freshman year of college-level education to move beyond the US borders, to make connections with the diversity of European cultures, and to think as citizens of a global world. This introductory course focuses on contemporary France from the perspective of a long European historical and cultural tradition, as well as in the new context of post-May 29, 2005. (French vote against the EU Constitution) The icons on both sides of the Euro banknotes serve as illustrations of the scope of this course: bridges will be established between European countries, and windows will open onto 21st Century France at a critical crossroad. This course ultimately leads students to ask themselves new questions about their own history, identity and culture. Special fee. Writing intensive. 4 cr.

444C. World of Salvador Dali
Students investigate essential components of modern culture and Western tradition through the mind, art and writing of Salvador Dalí. This interdisciplinary course poses fundamental, universal questions about human existence including death, rebirth, eternity and God, sexuality and love as well as the irrational dark side of our psyche. Certain cultural movements such as the Surrealist movement, Freudian psychoanalysis, the Gothic tradition and modern scientific discoveries and concepts are also explored. Special fee. Writing intensive. 4 cr.

540. Film History
Examines the historical development of film from a global perspective and the emergence of national cinemas as well as the cross-cultural influences that have produced the modern transnational film industry. Special fee. 4 cr.

791. Methods of Foreign Language Teaching
Major objective, methods and techniques in teaching foreign languages from elementary grades through college. Discussion, demonstration, preparation of instructional materials, microteaching of the language skills, including developments in computer-aided instruction. Special fee. 4 cr.

Latin (LTN)
(For program description, see page 42.)

401-402. Elementary Latin
Elements of grammar, reading of simple prose. (No credit for students who have had two or more years of Latin in secondary school; however, any such students whose studies of Latin have been interrupted for a significant period of time should consult the section supervisor about possibly receiving credit.) Special fee. 4 cr.

501. Review of Latin
Intensive review of Latin grammar and vocabulary. Designed primarily for those whose study of Latin has been interrupted for a year or more and for those who have had only two years of high school Latin. Special fee. 4 cr.

502. Latin Syntax and Composition
A continuation of LATIN 501. Intensive review of Latin syntax; introduction to reading and composition. Special fee. 4 cr.

503-504. Intermediate Latin
Review. Readings from Cicero, Caesar, Sallust, Livy, Catullus, Horace, Ovid, Plautus, Terence, and Seneca. Prereq: LATIN 402 or equivalent. Special fee. 4 cr.

595. Directed Reading
Independent study of a classical or medieval Latin author. May be repeated. Prereq: LATIN 503, 504, or equivalent. Special fee. Cr/F 2 or 4 cr.

605, 606. Readings in Latin Literature
Reading and analysis of major works of Latin literature. Focus on improving translation skills and comprehension of Latin grammar and Latin language. Introduction to the critical analysis of Latin literature in the context of Roman civilization and culture. Prereq: Latin 504 or equivalent with a grade of C or better. Satisfies foreign language requirement. Special fee. 4 cr.

631, #632. Latin Prose Composition
Grammar review; study of Latin prose style; English to Latin translation. Prereq: permission. Special fee. 4 cr.

752. Cicero and the Roman Republic
Prereq: permission. Special fee. Writing intensive. 4 cr.

753, 754. Advanced Studies in the Literature of the Golden Age
A) Lucan; B) Catullus; C) Caesar; D) Sallust; E) Virgil; F) Horace; G) Tibullus; H) Propertius; I) Ovid; J) Livy. Major Roman authors from the dictatorship of Sulla to the death of Augustus. Prereq: permission. Special fee. Writing intensive. 4 cr.

775, 756. Advanced Studies in the Literature of the Silver Age
A) Seneca the Younger; B) Persius; C) Petronius; D) Lucan; E) Statius; F) Quintilian; G) Martial; H) Juvenal; I) Tacitus; J) Pliny the Younger. Major Roman authors from the reign of Nero to the death of Trajan. Prereq: permission. Special fee. Writing intensive. 4 cr.

795, 796. Special Studies
A) Minor Authors of the Republic; B) Plautus; C) Terence; D) Minor Authors of the Empire; E) Suetonius; F) Latin Church Fathers; G) Medieval Latin; H) Advanced Latin Composition; I) Introduction to Classical Scholarship; J) Latin Epigraphy; K) Italic Dialects; L) Comparative Grammar of Greek and Latin; M) Roman Law. Topics selected by instructor and student in conference. Prereq: permission. Special fee. 4 cr.

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Languages, Literatures, & Cultures (LLC)
(For program description, see page 39.)

401-402. Elementary Language Study
Generic course introduces students to a foreign language and culture through speaking, listening, reading, writing, labs and films. Designed for students without previous training in the specified language. 401-402 taken together satisfies the foreign language requirement. Special fee. 4 cr.

440. Cultural Approaches to Film and Fascism
Taking a transnational perspective, this course examines the phenomenon of fascism through its cinematic representation. Analyzes definitions of fascism, narrative representations of fascism and the role of propaganda in fascism. Special fee. 4 cr.
Life Sciences & Agriculture (LSA)

(For program description, see page 83.)

400. Freshmen Seminar
Assistance to the undeclared student in identifying a major within the College of Life Sciences and Agriculture, including the biological, natural, and social sciences. The goal of this seminar is to support students in developing a sound academic program and assist them in making a successful transition from high school to college. The seminar also covers strategies for being a successful college student. Guest speakers from departments and programs lead discussions on career opportunities. Required for all first-semester LSA undeclared students. Cr/F. 1 cr.

Linguistics (LING)

(For program description, see page 43.)

405/405H. Introduction to Linguistics
Overview of the study of language: universal properties of human language, Chomsky's innate hypothesis, language acquisition in children, dialects and language variation, language change. Includes an introduction to modern grammar (phonology, syntax, and semantics) and to scientific linguistic methodology. (Also offered as ENGL 405.) 4 cr.

444B. Secret Lives of Words
Using problem and inquiry-based pedagogy, this class delves into the ways in which new words are coined, how they become established or die, and how they change over their natural lives. Touching upon topics in philosophy (the nature of meaning), theoretical linguistics (morphology, sociolinguistics), and lexicography, it introduces students to both the methods of text-based analysis and field-based research. Topics include word formation; the history of vocabulary in English; the making of dictionaries; slang, jargon, and taboo language. Writing intensive. (Also listed as ENGL 444B.) 4 cr.

605. Intermediate Linguistic Analysis
Analysis and problem solving in phonology, morphology, and syntax using data from many languages. Emphasis is both practical (learning how to describe grammar and sound system of a language) and theoretical (understanding languages' behavior). Prereq: LING/ENGL 505, or permission. (Also offered as ENGL 605.) 4 cr.

620. Applied Experience in Linguistics
Students who have an opportunity for appropriate career-oriented work experience may arrange with a faculty sponsor to add an academic component. The work must be related to the linguistics major, and nonacademic employers must normally be an established organization approved by Career Services. Research and writing required in addition to the job experience. Registration requires permission of employer, faculty sponsor, and major adviser. May be repeated with permission to a maximum of 8 credits. Up to 4 credits may count toward the linguistics major requirements, with permission of the program coordinator. Prereq: LING 505; permission. Cr/F. 1 to 4 cr.

695. Senior Honors
Open to senior LING majors who, in the opinion of the department, have demonstrated the capacity to do superior work. Prereq: permission. 4 cr.

717. World Englishes
Study of the forms and functions of Englishes in various parts of the world and the linguistic, sociolinguistic, literary, pedagogical, and political implications of the worldwide spread of the language. Topics include language change, language policies, language and power, language and culture, language and identity, literary creativity, and linguistic imperialism. (Also offered as ENGL 717.) 4 cr.

719. Sociolinguistics Survey
How language varies according to the characteristics of its speakers: age, sex, ethnicity, attitude, time, and class. Quantitative analysis methods; relationships to theoretical linguistics. Focus is on English, but some other languages are examined. Prereq: LING 505 or permission. (Also offered as ENGL 719.) 4 cr.

779. Linguistic Field Methods
Study of a non-Indo-European language by eliciting examples from an informant, rather than written descriptions of the language. Students learn how to work out the grammar of a language from raw data. Prereq: ENGL/LING 505. (Also offered as ENGL 779.) (Not offered every year.) Writing intensive. 4 cr.

790. Special Topics in Linguistics Theory
Advanced course on a topic chosen by the instructor. Inquire at the English department office for a full course description each time the course is offered. Topics such as word formation, dialectology, linguistic theory, and language acquisition, history of linguistics, language and culture, cross-disciplinary studies relating to linguistics. Barraging duplication of subject, may be repeated for credit. (Also offered as ENGL 790.) Writing intensive. 4 cr.

793. Phonetics and Phonology
Sound system of English and of other languages viewed from the standpoint of modern linguistic theory, including the following topics: the acoustic and articulatory properties of speech sounds, the phonemic repertoires of particular languages, phonological derivations, and prosodic phenomena such as stress and intonation. Prereq: a basic linguistics course or permission. (Also offered as ENGL 793.) 4 cr.

794. Syntax and Semantic Theory
Relationship of grammar and meaning viewed from the standpoint of modern linguistic theory. Emphasis on the syntax and semantics of English, with special attention to the construction of arguments for or against particular analyses. Prereq: a basic linguistics course or permission. (Also offered as ENGL 794.) Writing intensive. 4 cr.

795. 796. Independent Study
A) Synchronic Linguistics, B) Diachronic Linguistics, C) Linguistic Theory. For students showing a special aptitude for linguistics who desire to pursue a line of inquiry for which no appropriate course is offered. All requests must be forwarded by the faculty sponsor to the director of the Inter-departmental Linguistics Committee. 1 to 4 cr.

Management (MGT)

(For program description, see page 107.)

580. Introduction to Organizational Behavior
Application of behavioral science concepts to work settings in profit and nonprofit organizations. Individual behavior, interpersonal relations, work groups, relations among groups studied in the context of organizational goals and structure. Experiential focus. For first and second year majors and minors. No credit for students who have had MGT 611. Prereq: ECON 401 or 402. 4 cr.

614. Organizational Leadership and Structure
How structural characteristics in an organization (e.g., the design of roles, reporting relationships, coordinating mechanisms, communication systems, and processes, etc.) affect whether leader actions and choices enable or prevent high performance. An open systems framework is used to assess how reactions to change occurring inside and outside an organization determine whether individuals, groups, and organizations position themselves to adapt, grow and develop, or decline. Examination of individual roles in organizations. Prereq: ADMN 611. 4 cr.

647. Business Law I
Law of contracts, agency, sales, negotiable instruments, real and personal property, partnership and corporations, with application of the Uniform Commercial Code. Prereq: Junior standing. ECON 401, ECON 402, and ADMN 420. 4 cr.

648. Business Law II
Law of contracts, agency, sales, negotiable instruments, real and personal property, partnership and corporations, with application of the Uniform Commercial Code. Prereq: MGT 647. 4 cr.

701. Business, Government, and Society
Examination of individual roles in organizations. How structural characteristics in an organization (e.g., the design of roles, reporting relationships, coordinating mechanisms, communication systems, and processes, etc.) affect whether leader actions and choices enable or prevent high performance. An open systems framework is used to assess how reactions to change occurring inside and outside an organization determine whether individuals, groups, and organizations position themselves to adapt, grow and develop, or decline. Examination of individual roles in organizations. Prereq: ADMN 611; at least two of ADMN 601, 640, and 651. 4 cr.

713. Leadership Assessment and Development
Activities and exercises to help students determine their ideal job upon graduation as well as their career goals for the next three to five years. Students learn a matrix of key leadership behaviors and skills that distinguish high-performing managers and executives. Each student's behavior is assessed using this model so that students can determine how they need to adapt, grow and develop, or decline. Prereq: ADMN 611. 4 cr.

732. Exploration in Entrepreneurial Management
Examines the management of change and innovation, especially the role of entrepreneur in managing new ventures. Uses case analysis, guest speakers, and business plan preparation to study the characteristic behavioral, organizational, financial, and marketing problems of entrepreneurs and new enterprises. Prereq: ADMN 601, 611, and 651. Writing intensive. 4 cr.
742. Internship in Entrepreneurial and Management Practice
Involves working for leading companies and dynamic entrepreneurs, as well as classroom instruction. The priority experiential, real-world, and real-time learning in the high growth environment of entrepreneurial ventures. Focuses on several topic areas, including venture capital. Prereq: senior standing. Permission. (Also listed as DS 742.) 4 cr.

755. International Management
Develops an understanding of international ventures and partnerships from the viewpoint of management, leadership, human resource management, and organizational structure and strategy. Emphasizes the impact of culture on business dynamics of entrepreneurship, as well as classroom instruction. Prereq: senior standing; permission. (Also listed as OS 742.) 4 cr.

758. International and Multicultural Environments
Real-time learning in the high growth environment of international ventures and partnerships from the viewpoint of management, leadership, human resource management, and organizational structure and strategy. Emphasizes the impact of culture on business dynamics of entrepreneurship, as well as classroom instruction. Prereq: senior standing; permission. (Also listed as OS 742.) 4 cr.

Marketing (MKTG)

(For program description, see page 105.)

550. Survey of Marketing
Focuses on marketing as the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods and services to create exchanges that satisfy individual and organizational objectives. For non-business administration majors and minors. No credit for students who have had ADMN 651. Prereq: ECON 401 or 402. 4 cr.

598. Topics in Marketing
Special topics covering a variety of marketing principles. Topics may include promotion and advertising; retail and sales management; sales and service management. May be repeated up to 12 credits. 4 cr.

750. Strategic Marketing
Practical application of marketing principles taught in MKTG 651. Through case analysis, students learn to apply marketing principles to the planning, organization and control of marketing activities in large national and multinational corporations and small businesses. Issues such as new product development, pricing policies, selection of domestic and international channels of distribution, and interrelationships between marketing, production and finance are covered. Prereq: ADMN 651 and permission. MKTG 752 and/or MKTG 753 are recommended. 4 cr.

751. Advertising and Promotion
Covers the development of advertising strategy based on an assessment of the firm's competencies, its competitive environment, and an understanding of target consumer behavior. Includes the creation and execution of advertisements and sales promotions, media planning, and budgeting. The course draws upon the marketing principles taught in MKTG 651. Prereq: ADMN 651 and permission. MKTG 752 and/or MKTG 753 are recommended. 4 cr.

752. Marketing Research
Examines marketing information management and decision-making. MR is an essential business process and an integral part of marketing management, a process by which marketing information is collected, analyzed, disseminated, and acted upon. Course provides the tools, techniques, data sources and research approaches commonly used for market research and analysis. Hands-on analysis of marketing data sets is provided by using leading statistical software packages. Prereq: ADMN 651 or equivalent. 4 cr.

753. Consumer/Buyer Behavior
Covers concepts, models, and theories from the behavioral sciences applied to consumer decision making and purchasing behavior. Examines consumer behavior from economic, psychological, sociological, and anthropological perspectives. Topic coverage includes discussion of marketing strategies and tactics to influence consumer choice. Prereq: ADMN 651. Writing intensive. 4 cr.

754. Retail Management
Analysis of managerial problems in retailing establishments. Focuses on operational problems, retail store organization, location analysis, buying and inventory management, retail financial management, and selling and sales promotion. Other areas include environmental effects on retailing, the formulation of retail strategy, human resource issues, and customer service. Prereq: ADMN 651. 4 cr.

755. Marketing of Services
The marketing of intangible offerings, including profit and non-profit situations, retail and business-to-business settings, public and international services. Covers theory, service quality attainments, design and strategy, and implementation plans. Texts, case analysis, speakers, field work. Prereq: ADMN 651. 4 cr.

756. Franchising
Designed to provide an understanding of franchising as a system of distribution and business expansion. Franchising is studied from both the perspectives of the franchisee and the franchiser. In addition, economic, financial, and legal issues associated with franchising are covered. By the end of the course, students have skills and sources of information that permit sound assessment of the business opportunities available in franchising. Prereq: ADMN 651 or HMGT 600. (Also offered as HMGT 756.) 4 cr.

757. Integrated Marketing Communication
Provides balanced coverage of all marketing communication tools: advertising, sales promotion, public relations, direct marketing, personal selling, POP, packaging, sponsorships, licensing, customer service. Emphasizes the integration of these tools to send target audiences a consistent, persuasive message that promotes the organization's goals. Prereq: ADMN 651. 4 cr.

760. International Marketing
Environmental factors affecting international trade: culture and business customs, political and legal factors and constraints, economic and technological development, and the international monetary system. Integration of these with the marketing management functions of market research and segmentation; product, promotion, distribution, and pricing decisions. Prereq: ADMN 651. 4 cr.

761. Sales Management
Principles and methods of successful personal selling and management of the sales function. Exposure to selling experience in field of student interest; case studies, sales presentations; oral and written analyses of sales management issues. Prereq: ADMN 651. 4 cr.

762. Marketing Workshop
An integrative study of the real marketing situation in a business, nonprofit institution, or government agency. Student teams identify problem, collect appropriate data, suggest alternative solutions, and submit a recommended course of action. Prereq: senior standing; at least two of MKTG 752, 753, and 763. Writing intensive. 4 cr.

763. Market Opportunity Analysis
Introduces students to the analysis of the business environment in which a company operates and provides key inputs into strategic marketing planning and decision-making. Students learn the process, concepts, and techniques commonly used in the identification, assessment, and forecasting of market opportunities. Prereq: ADMN 651. Pre-or Coreq: ADMN 640. 4 cr.

764. New Product Development
Tactical and strategic issues concerned with the development and marketing of product and service innovations. Equips students with the concepts, tools, and approaches useful in the development, management, and marketing of products and services. Provides an integrated experience of the process of uncovering customer problems, understanding these problems, and providing superior solutions. Prereq: MKTG 651 or equivalent. 4 cr.

798/798W. Topics
Special topics; may be repeated. Prereq: a basic marketing course and permission. 4 cr.

Materials Science (MS)

(For program description, see page 69.)

401. Science of Stuff
Materials Science is a relatively new and fast growing field that studies all types of materials, including metals, ceramics, polymers, semiconductors, and composites. Material Science explores how stuff is put together, how to change stuff and make it better, the properties and applications of stuff, and even how to make totally brand new stuff. This course explores materials from various topic areas, including sports, forensics, medicine and health, fashion, architecture and construction, music and art, food and transportation from the perspective of materials science. Students explore additional materials independently as well as practice the process of science through simple experimentation and data analysis. 4 cr.

762. Electronic Materials Science
Provides students with a foundation in the materials science of modern electronic devices. Examples are taken primarily from the fields of semiconductor electronics and nanotechnology. Prereq: PHYS 408, MATH 527. 4 cr.
Mathematics (MATH)

(For program description, see page 66.)

301. Elementary Math I
Beginning algebra including integer operations, solving linear equations, graphing linear functions, solving linear inequalities, systems of linear equations, polynomials, rational expressions and equations, and exponents and radicals. May not be taken for credit toward a bachelor's degree. 4 cr.

302. Elementary Math II
Review of elementary algebra, exponents, polynomials, factoring, quadratic equations, and absolute value. Solving linear and quadratic functions and inequalities; systems of equations; radical equations. Linear functions and related notions; quadratic functions. May not be taken for credit toward a bachelor's degree. Prereq: MATH 301 or the equivalent. 4 cr.

418. Analysis and Applications of Functions
Analysis and applications of algebraic and transcendental functions, with special emphasis on exponential, logarithmic, and trigonometric functions. Graphical analysis. Written projects are required on some or all of the following topics: rates of change, optimization, logarithmic or exponential modeling, and trigonometric functions. Intended for students planning to take MATH 425. Prereq: MATH 302 or equivalent. Not offered for credit if credit is received for MATH 424 or MATH 425. 4 cr.

420. Finite Mathematics
Topics selected from probability, systems of linear equations, matrix algebra, linear programming, mathematics of finance. Not a preparation for calculus. Prereq: MATH 302 or the equivalent. Not offered for credit to mathematics majors. 4 cr.

424A. Calculus for Social Sciences
Real-valued functions and their graphs; derivatives and their applications; antiderivatives and areas; exponentials and logarithms; introduction to multivariable calculus and partial derivatives. Primarily intended for majors in College of Liberal Arts and the Whittome School of Business and Economics. Prereq: MATH 418 or equivalent. (Not offered for credit to CEPS majors; not offered for credit if credit is received for MATH 425.) Students enrolled in MATH 424 are required to take a competency evaluation on algebra during the first week of the semester. Those doing unsatisfactory work will be required to take MATH 418 before enrolling in MATH 424 or to complete review assignments in the Mathematics Center (MaC) concurrently with MATH 424. Students who desire a two-semester calculus course are strongly advised to take MATH 425. Those students who successfully complete MATH 424A and subsequently wish to continue their study of mathematics with MATH 426 are required to complete successfully a supplementary module and examination on trigonometric content. 4 cr.

425/425H. Calculus I
Calculus of one variable covering limits, derivatives of algebraic, trigonometric, exponential, and logarithmic functions; applications include curve sketching, max-min problems, related rates, and volume and area problems. Prereq: completing MATH 418 with a grade of C or better or qualifying with the placement examination. (Not offered for credit if credit is received for MATH 424.) Enrollment in MATH 425H requires concurrent enrollment in PHYS 407H. 4 cr.

426/426H. Calculus II
Second course in calculus of one argument, techniques and applications of integration, polar coordinates, and series. Prereq: MATH 425. Enrollment in MATH 426H requires concurrent enrollment in PHYS 408H. 4 cr.

439. Statistical Discovery for Everyone
Introduces statistical concepts and practice without assuming a calculus background. Topics include observational and designed studies, data production, exploratory data analysis, descriptive statistics, probability concepts and calculations, discrete and continuous random variables and their distributions, sampling distributions, parametric estimation and confidence intervals, hypothesis testing, comparing samples, and simple linear regression. Science and engineering students should take MATH 539 or MATH 644 according to their major. Not offered for credit if credit is received for ADM 430, ADMN 430, BIOL 528, EREC 525, HHS 540, MATH 539, MATH 644, PSYC 402, SOC 502. 4 cr.

525. Linearity I
Examines the fundamental role that linear models play in science and engineering; and the role of linearization in understanding nonlinear phenomena. Models are considered along several conceptual axes: discrete to continuous, one-dimensional to multidimensional, and static to dynamic, with an emphasis on the former. Mathematical areas of coverage include matrix algebra, concepts from calculus of several variables, difference equations, and linear transformations. Prereq: MATH 426, permission. Lab. 6 cr.

526. Linearity II
Continuation of study of linear models and the process of linearization begun in MATH 525, with an emphasis on models of dynamic phenomena. Additional mathematical areas of coverage include differential equations, eigenvalue and eigenvector analysis, phase plane analysis, and additional concepts from vector calculus. Prereq: MATH 525, permission. Lab. 6 cr.

527. Differential Equations with Linear Algebra
Fundamental methods of solving first-order equations, essentials of matrix algebra; higher-order linear equations, and linear systems; series solutions; Laplace transforms; selected applications. Prereq: MATH 426. 4 cr.

528. Multidimensional Calculus
Partial differentiation; composite functions and chain rules; maximum and minimum; transformations; vector algebra; vector functions; gradient, divergence, and curl; curves and surfaces; multiple, line, and surface integrals; divergence, Green's and Stokes' theorem. Prereq: MATH 426. 4 cr.

531. Mathematical Proof
Introduces reading and writing proofs in mathematics. The basic language of mathematics common to all branches of the subject, especially set theory and basic logic. Prereq: MATH 426. Writing intensive. 4 cr.

532. Discrete Mathematics
Counting principles (including permutations, combinations, pigeonhole principle, inclusion-exclusion principle); big-O relation; graphs, trees, and related topics. Prereq: MATH 531. 4 cr.

539. Introduction to Statistical Analysis
Introducing concepts of probability and scientific methods for data analysis. Exploratory data analysis, survey sampling, probability, discrete and continuous distributions, confidence intervals, hypothesis testing, comparing samples, linear regression, analysis of variance. Statistical software is used. Prereq: MATH 426. 4 cr.

545. Introduction to Linear Algebra and Mathematical Proof
Introduction to mathematical writing and proof in the context of basic linear algebra. Designed to reinforce ideas seen throughout the mathematics curriculum. Centered on an intense study of vector spaces and linear systems, beginning with a brief study of linear system equations, progressing to a discussion of linear transformation and vector spaces. (Not offered for credit if credit is received for MATH 465.) Prereq: MATH 426. Writing intensive. 4 cr.

601. Exploring Mathematics for Teachers I
Provides prospective elementary teachers with the opportunity to explore and master concepts involving number systems and operations, data analysis and probability. Mathematical reasoning, problem solving, and the use of appropriate manipulatives and technology are integrated throughout the course. Readings, class discussions, and assignments focus on mathematics content as well as applicable theories of learning, curriculum resources, and state and national recommendations. The course models instructional techniques that can be adapted to the elementary curricula. Prereq: EDUC 500. (Not offered for credit if credit is received for MATH 621, 623, 721, and/or 723; not offered for credit to CEPS majors.) 4 cr.

602. Exploring Mathematics for Teachers II
Provides prospective elementary teachers with the opportunity to explore and master concepts involving geometry, measurement, and algebraic thinking. Mathematical reasoning, problem solving, and the use of appropriate manipulatives and technology are integrated throughout the course. Readings, class discussions, and assignments focus on mathematics content as well as applicable theories of learning, curriculum resources, and state and national recommendations. The course models instructional techniques that can be adapted to the elementary curricula. Prereq: EDUC 500. (Not offered for credit if credit is received for MATH 621, 623, 721, and/or 722; not offered for credit to CEPS majors.) 4 cr.

619. Historical Foundations of Mathematics
Historical development of number theory, geometry, probability, algebra, and analysis. Study of
the significant mathematical contributions to these topics made by prominent mathematicians spanning several historical periods. Prereq: MATH 531 or 545. 4 cr.

621. Number Systems for Teachers
Problem solving; counting and set concepts, number systems (whole numbers, integers, rational, and real numbers); number theory; estimation and mental calculation techniques; and applications requiring calculators and computers. Manipulatives and models are used in a lab setting to illustrate the concepts and properties of the number systems and teach number sense. (Not offered for credit to mathematics majors, except those in elementary or middle school options of the B.S. in Mathematical Education degree program.) Offered in alternate years in the fall semester. Prereq: permission. 4 cr.

622. Geometry for Teachers
Properties of plane and space figures; tessellations; symmetry; LOGO computer language; nonstandard, English, and metric units of measure; area and perimeter; solid figures, surface area; estimations and approximations of measurements; constructions; congruence and similarity mappings; problem solving using geometric and algebraic skills, and applications requiring calculators and computers. Manipulatives and models are used in a lab setting to illustrate concepts and properties of geometry. (Not offered for credit to mathematics majors, except those in the elementary or middle school options of the B.S. in Mathematical Education degree program.) Offered in alternate years in the spring semester following MATH 621. Prereq: MATH 621 or permission. 4 cr.

623. Topics in Mathematics for Teachers
Logic (valid and invalid forms of reasoning); descriptive statistics (graphs, measures of central tendency, measures of variation); inferential statistics (sampling distributions, measures of relative standing, simulations); probability (experimental, geometrical, and theoretical); permutations and combinations; probability simulations; problem solving using skills from statistics and probability; mathematical connections and communication review of computer software; and applications requiring calculators and computers. (Not offered for credit to mathematics majors, except those in the elementary or middle school options of the B.S. in Mathematics Education degree program.) Offered in alternate years in the fall semester following MATH 622. Prereq: MATH 621 of permission. 4 cr.

624. Analysis for Secondary School Teachers
Examines concepts from calculus and pre-calculus mathematics with an emphasis on connecting and logically refining the concepts of function, limit, sequences, series, and probability. Includes a deeper analysis of problems and topics drawn from secondary school mathematics with the kind of mathematical knowledge and sophistication that the student has gained from other college mathematics courses. Proofs for many of the theorems that are typically introduced in a non-rigorous fashion in calculus are studied. Prereq: MATH 425, 545 or equivalent, EDUC 500 or by permission. Offered in alternate years in the spring semester following MATH 623. 4 cr.

644. Statistics for Engineers and Scientists
Introduces the design of controlled experiments and the collection and analysis of scientific data. Use of a statistical software package is an integral part of the course; interpreting and drawing conclusions from standard software output is emphasized. Graphical data analysis, statistical process control, regression and correlation, multifactor experimental designs, confidence intervals, hypothesis testing. (Not offered for credit if credit is received for MATH 639.) Prereq: MATH 426. 4 cr.

645. Linear Algebra for Applications
Fundamental notions of vector space theory, linear independence, basis, span, scalar product, orthogonal bases. Includes a survey of matrix algebra, solution of systems of linear equations, rank, kernel, eigenvalues and eigenvectors, the LU- and QR-factorizations, and least squares approximations. Selected applications in mathematics, science, engineering and business. Prereq: MATH 426. (Not offered for credit if credit is received for MATH 545 or MATH 762.) 4 cr.

646. Introduction to Partial Differential Equations
Introduces the solution of partial differential equations. Models arising from initial-boundary value problems of mathematical physics and Sturm-Liouville problems are examined; solution techniques include separation of variables, Bessel functions, series expansions by orthogonal functions, and numerical methods. Prereq: CS 410 or 415; MATH 527; 528; 645; or permission. 4 cr.

647. Complex Analysis for Applications
Complex numbers, analytic functions, Cauchy-Riemann equations, conformal mapping, contour integration, Cauchy's integral formula, infinite series, residue calculus, Fourier and Laplace transforms. Prereq: MATH 528. (Not offered for credit if credit is received for MATH 788.) 4 cr.

656. Introduction to Number Theory
Unique factorization, arithmetic functions, linear and quadratic congruences, quadratic reciprocity law, quadratic forms, introduction to algebraic numbers. Prereq: MATH 531. Offered in alternate years. 4 cr.

657. Geometry
Advanced approach to fundamental properties of Euclidean and other geometries. Prereq: MATH 531 or permission. 4 cr.

658. Topics in Geometry
Topics selected from among projective geometry, finite geometries, convexity, transformational geometry, non-Euclidean geometry, and other areas of elementary geometry within the framework of modern mathematics. Prereq: MATH 651. Offered in alternate years. 4 cr.

696, 696W. Independent Study
Individual projects of study developed by the student and a faculty sponsor. Intended for students with superior scholastic achievement. May be repeated up to 8 credits. May be taken as writing intensive. Prereq: a written proposal, including goals and assessment, endorsed by a faculty sponsor and approved by the department chairperson. 1 to 4 cr.

698. Senior Seminar
Explores mathematical topics beyond the student's previous coursework. Focuses on problem solving, generation of problems, and oral and written communication of mathematics. Prereq: senior standing in mathematics or mathematics education. 4 cr.

700. Introduction to Mathematics Education
General background information about mathematics education, such as theories of learning and teaching mathematics, mathematics curricula, classroom management, and techniques the teaching, learning, and assessment of mathematics that are common to all levels of mathematics education. Prereq: MATH 426, EDUC 500 or equivalent, or by permission. 4 cr.

701. Exploring Mathematics for Teachers I
Provides prospective elementary teachers with the opportunity to explore and master concepts involving number systems and operations, data analysis and probability. Mathematical reasoning, problem solving and the use of appropriate manipulatives and technology are integrated throughout. Readings, class discussions, and assignments focus on mathematics content as well as applicable theories of learning, curriculum resources, and state and national recommendations. The course models instructional techniques that can be adapted to the elementary curricula. Credit offered only to M.Ed. and M.A.T., certificate-only students, and in-service teachers. Prereq: EDUC 500. (Not offered for credit if credit is received for MATH 621, 623, 721, and/or 723.) 4 cr.

702. Exploring Mathematics for Teachers II
Provides prospective elementary teachers with the opportunity to explore and master concepts involving geometry, measurement, and algebraic thinking. Mathematical reasoning, problem solving and the use of appropriate manipulatives and technology are integrated throughout the course. Readings, class discussions, and assignments will focus on mathematics content as well as applicable theories of learning, curriculum resources, and state and national recommendations. The course models instructional techniques that can be adapted to the elementary curricula. Credit offered only to M.Ed. and M.A.T., certificate-only students, and in-service teachers. Prereq: EDUC 500. (Not offered for credit if credit is received for MATH 621, 622, 721, and/or 722.) 4 cr.

703. Teaching of Mathematics, K-6
Methods of teaching; uses of manipulatives, models, and diagrams in instruction; purposes and methods of assessment; curriculum standards and goals; review and evaluation of textbooks and computer software; uses of calculators and computers in the elementary curricula. Credit offered only to M.Ed. and M.A.T., certificate-only students, and in-service teachers. Prereq: EDUC 500. (Not offered for credit if credit is received for MATH 621, 622, 721, and/or 722.) 4 cr.

721. Number Systems for Teachers
Problem solving; counting and set concepts, number systems (whole numbers, integers, rational, and real numbers); number theory; estimation and mental calculation techniques; and applications requiring calculators and computers. Manipulatives and models are used in a lab setting to illustrate the concepts and properties of the number systems. Credit offered only to M.Ed. and M.A.T., certificate-only students, and in-service teachers. Prereq: 721 or permission. Offered in alternate years in the spring semester following MATH 721. 4 cr.

722. Geometry for Teachers
Properties of two- and three-dimensional figures; tessellations; symmetry; nonstandard, English, and metric units of measure; area and perimeter; volume and surface areas; estimations of measurements; constructions; congruence and similarity mappings; applications requiring calculators and computers. Manipulatives and models are used in a lab setting to illustrate concepts and properties of geometry. Credit offered only to M.Ed. and M.A.T., certificate-only students, and in-service teachers. Prereq: 721 or permission. Offered in alternate years in the spring semester following MATH 721. 4 cr.
723. Topics in Mathematics for Teachers
Descriptive statistics; inferential statistics; simulations; probability (experimental, geometrical, and theoretical); permutations and combinations; problem solving using skills from statistics and probability; applications requiring calculators and computers. Credit offered only to M.Ed. and M.A.T., certificate-only students, and in-service teachers. Prerequisite: 721 or permission. Offered in alternate years in the fall semester following MATH 722. 4 cr.

737. Statistical Methods for Quality Improvement
Introduces scientific data collection and analysis with an emphasis on industrial and service provider applications. Topics include: descriptive and graphical statistical methods; confidence intervals and hypothesis testing; regression; ANOVA; statistical process control (SPC); failure modes and effects analysis (FMEA); Six-Sigma concepts and methods; introduction to Reliability; quality tools, MSA, and process capability studies; introduction to Lean methodology, such as 5S, Kaizen, and VSM. Use of a software package is an integral part of the course. Prerequisite: MATH 644. 4 cr.

739. Applied Regression Analysis
Statistical methods for the analysis of relationships between response and input variables: simple linear regression, residual analysis, and model selection, multicollinearity, nonlinear curve fitting, categorical predictors, introduction to analysis of variance, examination of validity of underlying assumptions. Emphasizes real applications with use of statistical software. Prerequisite: MATH 539 (or MATH 644). Writing intensive. 4 cr.

740. Design of Experiments I
Course in design of experiments with applications to quality improvement in industrial manufacturing, engineering research and development, or research in physical and biological sciences. Experimental factor identification, statistical analysis and modeling of experimental results, randomization and blocking, full factorial designs, random and mixed effects models, replication and subsampling strategies, fractional factorial designs, response surface methods, and screening designs. Focuses on various treatment structures for designed experimentation and the associated statistical analyses. Use of statistical software. Prerequisite: MATH 539 (or 644); or permission. 4 cr.

741. Survival Analysis
Explorations of models and data-analytic methods used in medical, biological, and reliability studies. Event-time data, censored data, reliability models and methods, Kaplan-Meier estimator, proportional hazards, Poisson models, loglinear models. Suitable statistical software, such as SAS or JMP, SPlus, or R, are used. Prerequisite: MATH 639 (or 644). 4 cr.

742. Multivariate Statistical Methods

744. Design of Experiments II
A second course in design of experiments, with applications in quality improvement and industrial manufacturing, engineering research and development, research in physical and biological sciences. Covers experimental design strategies and issues that are often encountered in practice: complete and incomplete blocking, partially balanced incomplete blocking (PBIB), partial confounding, interval and inner block information, split plotting and strip plotting, repeated measures, crossover designs, Latin squares and rectangles, Youden squares, crossed and nested treatment structures, variance components, mixed effects models, analysis of variance, optimizations, space filling designs, and modern screening design strategies. Prerequisite: MATH 740; or permission. 4 cr.

745, 746. Foundations of Applied Mathematics
Basic concepts and techniques of applied mathematics intended for graduate students and advanced undergraduates in mathematics, engineering, and the sciences. Topics include computational linear algebra, nonlinear differential equations, and partial differential equations. Methods examined include Fourier expansions and transforms, Laplace transforms, optimization techniques, linear spaces, eigenvalue analysis, Snum-Liouville systems, numerical methods, conformal mapping, and residue theory. Prerequisite: MATH 527; 528 or equivalent. 4 cr.

747. Introduction to Nonlinear Dynamics and Chaos
The mathematics of chaos and nonlinear dynamics. Topics include linear and nonlinear systems of ordinary differential equations, discrete maps, chaos, phase plane analysis, bifurcations and computer simulations. Prerequisite: MATH 527; 528; 645. 4 cr.

753. Introduction to Numerical Methods I
Introduces mathematical algorithms and methods of approximation. Topics include a wide survey of approximation methods. Methods examined include polynomial interpolation, root finding, numerical linear algebra, numerical integration, and the approximation of differential equations. Included in each case is a study of the accuracy and stability of a given technique, as well as its efficiency. Prerequisite: MATH 426; CS 410. 4 cr.

754. Introduction to Numerical Methods II
Introduces the tools and methodology of scientific computing through the examination of interdisciplinary case studies from science and engineering. Emphasizes numerical approaches to solving linear systems, eigenvalue-eigenvector Problems and ordinary and partial differential equations problems are solved on various hardware platforms using a combination of application software and data visualization packages. Prerequisite: CS 410 or 415; MATH 527, 645, 753; or permission. 4 cr.

755. Probability and Stochastic Processes with Applications
Introduces the theory, methods, and applications of randomness and random processes. Probability concepts, random variable, expectation, discrete and continuous distributions, stochastic processes, Markov chains, Poisson processes, moment-generating functions, convergence of random variables. Prerequisite: MATH 528 and 539 (or 644); or permission. 4 cr.

756. Principles of Statistical Inference
Introduces the basic principles and methods of statistical estimation and model fitting. One- and two-sample procedures, consistency and efficiency, likelihood methods, confidence regions, significance testing, Bayesian inference, nonparametric and resampling methods, decision theory. Prerequisite: MATH 755; or permission. 4 cr.

761. Abstract Algebra
Basic properties of groups, rings, fields, and their homomorphisms. Prerequisite: MATH 531 or 545. Writing intensive. 4 cr.

762. Linear Algebra
Vector spaces over arbitrary fields, linear transformations and their relationship with matrices, eigenvalues and eigenvectors, the rational and Jordan canonical forms for linear transformations. Prerequisite: MATH 761 4 cr.

764. Advanced Algebra
Topics selected from rings, modules, algebraic fields, and group theory. Prerequisite: MATH 761. Offered in alternate years. 4 cr.

765. One-Dimensional Real Analysis
Theory of limits, continuity, differentiability, and integrability. Prerequisite: MATH 531, or 545. Writing intensive. 4 cr.

776. Logic
Examination of the basic notions of soundness and completeness, first for sentential and then for propositional logic. Turning to the question of decision procedures for logical formulae, the concept of recursive function, which emerges in the work of Church and Turing, provides a key to the logic and theory of computation. The course culminates with Godel's Incompleteness Theorems, which demonstrate the intrinsic limitations of the logical method. Prerequisite: MATH 531. Offered in alternate years. 4 cr.

780. Teaching Middle School Mathematics
Teaching and learning of middle school mathematics. Students examine the major mathematical concepts presented in the middle school curriculum and learn techniques for planning, designing, and evaluating procedures for helping students to learn these concepts. Prerequisite: MATH 426, 700, and EDUC 500 or equivalents, or permission. Offered in alternate years in the spring semester. 4 cr.

784. Topology
Open sets, closure, base, and continuous functions; connectedness, compactness, separation axioms, and metrizability. Prerequisite: MATH 531. Writing intensive. 4 cr.

788. Complex Analysis
Complex functions, sequences, limits, differentiability and Cauchy-Riemann equations, elementary functions, Cauchy's theorem and formula, Taylor's and Laurent's series, residues, conformal mapping. Prerequisite: MATH 767. Not offered for credit if credit is received for MATH 647. 4 cr.

791. Teaching of Mathematics, 7-12
Methods for teaching middle and secondary school mathematics. Survey of current materials and curricular materials; uses of models, calculators, and computers; integrating reading, writing, and problem solving into mathematics curricula; methods of assessment; theories of learning mathematics; review and evaluation of curriculum materials, software and instructional resources; and introduction to professional organizations and suborganizations. Prerequisite: EDUC 500 or equivalent; MATH 426; or permission. Offered in alternate years in the spring semester. 4 cr.

796. Topics
New or specialized courses not covered in regular course offerings. Prerequisite: permission. May be repeated up to 8 credits. 4 cr.
799. Senior Thesis
Students work under the direction of a faculty sponsor to plan and carry out independent research resulting in a written thesis. Required for honors major. Prereq: senior standing; a written proposal endorsed by a faculty sponsor and approved by the department chairperson (or designee). May be repeated up to 4 credits. Writing intensive. 2 or 4 cr.

561. Introduction to Materials Science
The concepts of materials science and the relation of structure of material properties. Atomic structure, bonding material transport, mechanical properties of materials, solidification, phase diagrams, solid state transformations, and corrosion and oxidation. Laboratory exercises are carried out to demonstrate the basic concepts of the course. Prereq: one semester of introductory chemistry with a lab or equivalent. Writing intensive. 4 cr.

603. Heat Transfer
Analysis of phenomena: steady-state and transient conduction, radiation, and convection; engineering applications. Prereq: MATH 527, ME 608. Pre- or Coreq: CS 41 3 cr.

608. Fluid Dynamics
Dynamics and thermodynamics of compressible and incompressible fluid flow; behavior of fluids as expressed by hydrostatic, continuity, momentum, and energy equations. Prereq: ME 503. Coreq: ME 627. 3 cr.

627. Mechanics III
Introduction to particle and rigid body dynamics. Rectilinear and curvilinear motion, translation and rotation, momentum and impulse principles, and work-energy relationships. Prereq: ME 525 or permission. Writing intensive. 3 cr.

629. Kinematics and Dynamics of Machines
Kinematic and dynamic analysis of mechanisms and their synthesis. Applications to reciprocating engines; balancing and cam dynamics are developed. Prereq: ME 627. 3 cr.

643. Elements of Design
Analysis, synthesis, and design of machine elements and systems. Development of engineering judgment; selection of materials stress and failure analysis; kinematic arrangement design for finite and infinite life. Open-ended design problems unify course topics. Prereq: ME 526. Writing intensive. 3 cr.

646. Experimental Measurement and Data Analysis
Basic and advanced techniques of engineering and scientific parameter measurement including statistical data and error analysis, curve fitting, calibration and application of transducers, and technical writing. Laboratory experiments draw on concepts from mechanics, thermodynamics, and fluid mechanics. Prereq: ME 526; 608. Writing intensive. 4 cr.

670. Systems Modeling, Simulation, and Control
Lumped parameter models for mechanical, electrical, thermal, fluid, and mixed systems. Matrix representation, eigenvalues, eigenvectors, time domain solutions, frequency response plots, and computer simulations are used to explore system response. Design of system for desired responses. Introduces feedback control, stability, and performance criteria. Prereq: ECE 537, ME 608, MATH 527. Writing intensive. 4 cr.

695. Special Topics
Course topics not offered in other courses. May be repeated for credit. Lab. Prereq: permission. 2 to 4 cr.

696. Projects
Analytical, experimental, or design projects undertaken individually or in teams under faculty guidance. May be repeated for credit. 1 to 4 cr.

699. Engineering Internship
Internship experience provides on-the-job reinforcement of academic programs in mechanical engineering. Contact the Mechanical Engineering department office for guidelines. May be repeated to a maximum of 3 credits. Prereq: appropriate class standing in major, 2.5 grade point average, and permission. Cr/F. 1 cr.

702. Statistical Thermodynamics
Macroscopic thermodynamic principles developed by means of microscopic analysis. Prereq: ME 503. 4 cr.

705. Thermal System Analysis and Design
Engineering design of thermal systems that involve real problems and analysis of performance of the design. Design criteria include function, performance, optimization, economy, safety, and others as appropriate for the system. Required for ME seniors. Prereq: ME 603. Writing intensive. 4 cr.

707. Analytical Fluid Dynamics
Kinematics of flow; constitutive relationships; development of the Navier-Stokes equations; vortex theorems; potential flow. Prereq: ME 608. 4 cr.

708. Gas Dynamics
Study of one-dimensional subsonic and supersonic flows of compressible ideal and real fluids. Wave phenomena; linear approach to two-dimensional problems; applications in propulsion systems. Prereq: ME 608 or permission. 4 cr.

709. Computational Fluid Dynamics
Review of matrix methods; basics of finite differences, basics of spectral methods, stability, accuracy, Navier-Stokes solvers. Prereq: ME 603 or permission. 3 cr.

711. Coherent Optical Methods
Introduces electro-optic experimental techniques in mechanics. Optical fundamentals including elements of scalar diffraction theory, interferometry, holography, Doppler shifts, coherence, and laser speckle. Applications including, mechanical strain measurements, vibrational mode determination, fluid pressure, temperature measurements, and fluid velocity measurements. Concepts from course are demonstrated in lab. Prereq: permission. 3 cr.

712. Waves in Fluids
Linear and nonlinear dynamics of hyperbolic and dispersive wave systems with application to acoustic waves, surface and internal gravity waves, Rossby waves, and capillary waves. Key physical concepts include wave generation mechanisms, wavelength and amplitude dispersion, group velocity and energy propagation, steady streaming, and mode interactions. Prereq: ME 608 or equivalent. 3 cr.

4723. Advanced Dynamics
Classical dynamics oriented to contemporary engineering applications. Review of particle dynamics. Hamilton's principle and the Lagrange equations. Kinematic and dynamics of rigid bodies, gyroscopic effects in machinery and space structures. Prereq: ME 627 or permission. 4 cr.

724. Vibration Theory and Applications
Discrete vibrating systems. Linear system concepts; single-degree-of-freedom system with general excitation. Matrix theory and eigenvalue problems. Many degrees of freedom, normal mode theory for free and forced vibration. Numerical methods; introduction to continuous systems; applications to structural and mechanical systems. Prereq: ME 526; 627 or permission. 4 cr.

727. Advanced Mechanics of Solids
Stress, strain, stress-strain relations, anisotropic behavior, introduction to elasticity, plane stress, bending and torsion of members with general cross-sections introduction to thin plates and shells, energy methods. Prereq: ME 526 or permission. 4 cr.

**Mechanical Engineering (ME)**

*(For program description, see page 68.)*

441. Introduction to Engineering Design and Solid Modeling
Engineering design process and the language of graphical communication introduced via team design projects and laboratory exercises. Topics include sketching, 3-D visualization, computer aided design, solid modeling, projection theory, engineering drawings, report writing and oral communication. Writing intensive. 4 cr.

442. Manufacturing Engineering and Design
Introduces basic manufacturing processes associated with mechanical, electrical, and electronic systems through classroom lectures, seminars, laboratory exercises, field trips, and student projects. Prereq: ME 441. 4 cr.

503. Thermodynamics
Properties of a pure substance, work and heat, laws of thermodynamics, entropy, thermodynamic relations, cycles. Prereq: PHYS 407. Pre- or Coreq: MATH 528. 3 cr.

523. Introduction to Statics and Dynamics
Overview of statics and dynamics applying concepts to particles then to rigid bodies. Topics include two- and three-dimensional force systems; laws of equilibrium; analysis of trusses and frames; friction; relative motion; impulse-momentum principles; work-energy relationships. Prereq: MATH 426; PHYS 407. Not for ME majors. 3 cr.

525. Mechanics I
Introduces statics. Two- and three-dimensional force systems, the concept of equilibrium, analysis of trusses and frames, centroids, bending moment and shear force diagrams, and friction. Prereq: PHYS 407. Pre- or Coreq: MATH 426. Writing intensive. 3 cr.

526. Mechanics II
Introduces strength of materials. Analysis of members under torsion, axial, shear and bending stresses, superposition of stresses, stability of columns. Prereq: ME 525. Writing intensive. 3 cr.

542. Mechanical Dissection and Design Analysis
Engineering design and analysis of mechanical systems through in-depth dissection experiences. Relationships between functional specifications and design solutions, role of engineering analysis in design, and the importance of manufacturing constraints. Lab experiences include team dissections of mechanical artifacts, e.g., fishing reel, bike, electric drill. Introduces basic metal working operations. Prereq: ME 441. Coreq: ME 525 and permission. No credit if credit received for ME 442. 4 cr.

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**Mathematics, Mechanical Engineering**
730. Mechanical Behavior of Materials
Elastic and inelastic behavior of materials in terms of micro- and macromechanics. Stress, strain, and constitutive relations related to recent developments in dislocation theory and other phenomena on the atomic scale and to the continuum mechanics on the macroscopic scale. Elasticity, plasticity, visoelasticity, creep, fracture, and damping. Anisotropic and heterogeneous materials. Prereq: ME 526; 561 or permission. 4 cr.

731. Fracture and Fatigue Engineering
Material
Reviews fundamentals of linear elastic fracture mechanics and strain energy release rate analyses. Discusses basic methods of design for prevention of failure by fast fracture and fatigue for metals, ceramics, and polymers with attention to the effect of material properties and subsequent property modification on each design approach. Prereq: ME 526; 561 or permission. 4 cr.

735. Mechanics of Composite Materials

743. Satellite Systems, Dynamics, and Control
General satellite systems with emphasis on spacecraft dynamics and control. Includes general satellite information such as types of satellites, missions, and orbits, as well as satellite subsystems. Basic spacecraft dynamics and orbital mechanics topics are covered. Advanced topics include attitude and orbit estimation, and automatic attitude control. Prereq: ME 670 or permission. 3 cr.

744. Corrosion
The course is split into three parts. The first part reviews and develops basic concepts of electrochemistry, kinetics, and measurement methods. The second part covers the details of specific corrosion mechanisms and phenomena including passivity, galvanic corrosion, concentration cell corrosion, pitting and crevice corrosion, and environmentally induced cracking. The third part focuses on the effects of metallurgical structure on corrosion, corrosion in selected environments, corrosion prevention methods, and materials selection and design. Prereq: CHEM 403 or 403; ME 561 or permission. Lab. 4 cr.

747. Experimental Measurement and Modeling of Complex Systems
Experimental measurements for evaluation, design, and control of mechanical, electrical, and thermal/fluid phenomena. Emphasizes the dynamic response of both sensors and systems and the interactions between physical processes. Experimental examples are drawn from mechanics, material science, thermal-fluid science and controls. Prereq: ME 561; 546; 670. Writing intensive. 4 cr.

755. Senior Design Project I
Part I of this two-part sequence emphasizes problem definition, analysis, development of alternative concepts, decision-making processes, synthesis of an optimum solution and the development of a conceptual design. Lectures on these and other topics are combined with seminars given by professionals from industry, government, and academia. Related topics include ISO 9000 quality systems, engineering management, design review process, engineering economics, team building and communications. Students are organized into project teams to develop a conceptual design. Formal design reviews are conducted. A formal proposal documents the semester's work. Prereq: Senior standing in ME. Lab. Writing intensive. 2 cr.

756. Senior Design Project II
Continuation of Senior Design Project I, in which the proposal submitted in the previous course is developed into a prototype system. Part II emphasizes the development, assembly, testing and evaluation of the system designed in Part I. Lectures and seminars focus on the prototype development process, design verification and industry practices. A formal report documents the semester's work. Prereq: ME 755. Writing intensive. 2 cr.

757. Coastal Engineering and Processes
Introduces small amplitude and finite amplitude wave theories. Wave forecasting by significant wave method and wave spectrum method. Coastal processes and shoreline protection. Wave forces and wave structure interaction. Introduces mathematical and physical modeling. Prereq: ME 608 or permission. (Also offered as CIE 757 and OE 757.) 3 cr.

760. Physical Metallurgy I
Introduction to physical metallurgy; dislocations; thermodynamics of materials, diffusion, phase transformations, and strengthening mechanisms in solids. Prereq: ME 561 or permission. Lab. 4 cr.

761. Diffraction and Imaging Methods in Materials Science
Introduces x-ray diffraction and electron microscopy. Basic crystallography, reciprocal lattice, x-ray and electron diffraction, x-ray methods, transmission and scanning electron microscopy. Prereq: CHEM 403; PHYS 408 or permission. Lab. 4 cr.

763. Thin Film Science and Technology
The processing, structure, and properties of thin solid films. Vacuum technology, deposition methods, film formation mechanisms, characterization of thin films, and thin-film reactions. Mechanical, electrical, and optical properties of thin films. Prereq: ME 561 or permission. 4 cr.

770. Design with Microprocessors
Basic operation of microprocessors and microcontrollers is explained, and interfacing these devices to sensors, displays and mechanical systems is explored. Topics include: number systems, architecture, registers, memory mapping, interrupts and interfacing for system design. Methods of programming and interfacing with mechanical/electrical systems are covered in class, and then implemented in lab. Prereq: ECE 537 or permission. Lab. 4 cr.

772. Control Systems
Development of advanced control system design concepts such as Nyquist analysis, lead-lag compensation, state feedback, parameter sensitivity, controllability, observability, introduction to non-linear and modern control. Includes interactive computer-aided design and real-time digital control. Prereq: ME 547 or permission. (Also offered as ECE 772.) Lab. 4 cr.

773. Electromechanical Analysis and Design
Analysis and design of electromechanical systems using lumped parameter models and magnetic finite element analysis (FEA). Electrostatic and magnetic field equations are discussed and used to derive magnetic and electric lumped model elements. Brushless dc motor is analyzed using lumped models and FEA. Various drive types are discussed and the motor system analyzed to obtain torque-speed curves. Design principles are given and utilized in a design project. Prereq: ME 670 or permission. 4 cr.

776. Product Design
Provides a thorough overview of the steps in the engineering design process. Topics include product planning, need identification, specification formulation, benchmarking, concept generation and selection, design for manufacture, assembly, and environment. Students develop a product as part of a team. Prereq: ME 441 or equivalent CAD experience; ME 542 (Mechanical Dissection) or ME 442 (Manufacturing). 4 cr.

783. Geometric Modeling
Topics include curves, surfaces, solids, analytic and relational properties, intersections, transformations, and solid modeling. Emphasizes applications in computer graphics and CAD/CAM systems. Prereq: CS 410, MATH 528 or permission. 4 cr.

785. Solid Mechanics in Manufacturing
Characterization of material properties are studied with emphasis on plastic deformation. Also, numerical approaches to solve for the forces, stresses, and strains in manufacturing processes are covered. In particular, two prominent mass production manufacturing areas, metal forming and cutting, are examined. Prereq: ME 561; ME 627. 4 cr.

786. Introduction to Finite Element Analysis
Topics include basic matrix theory, potential energy approach, direct stiffness method, calculus of variations, development of finite element theory, and modeling techniques. Applications in solid mechanics, heat transfer, fluids, and electromagnetic devices, via both commercially available codes and student-written codes. Prereq: ME 526, 603 or permission. Lab. 4 cr.

795. Special Topics
New or specialized courses and/or independent study. May be repeated for credit. 2 to 4 cr.

797. Honors Seminar
Course enrichment and/or additional independent study in subject matter pertaining to a 600- or 700-level ME course other than ME 695, 696, 697, or 795. 1 cr.

Medical Laboratory Science (MLS)
(For program description, see page 95.)

401. Introduction to Medical Laboratory Science
Designed for students interested in the study of medical laboratory science. Program and career options, certification requirements, and medical ethics and professionalism. Cr/F. 1 cr.

444A. Seven Deadly Diseases
This course will analyze seven major disease processes and associated biological concepts. The student will evaluate each major disease process covered as to historical perspective, lore/misconceptions, disease etiology, physical impact of symptoms, diagnostic criteria, prevention and treatment. Emphasis will be placed upon clinical significance of race, class, gender, and global cultural traditions in the study of the selected diseases. The laboratory section will include hands on performance of pertinent diagnostic testing for disease identification. Lab fee. Writing intensive. 4 cr.
602. Seminar Clinical case study presentations emphasizing the role of the laboratory in diagnosing and treating disease and in maintaining health. Prereq: senior MLS majors only. Writing intensive. 2 to 4 cr.

610. Biomedical Lab Management An overview of biomedical laboratory management, including financial operations, personnel management, marketing, information management, and interdepartmental skills. Special fee. Writing intensive. 4 cr.

640. Phlebotomy Theory The procedures involved in blood collection with emphasis on safety and professionalism. Students observe all techniques and have an opportunity to perform them. Recommended for students considering a health care profession. Special fee. Permission required. 2 cr.

641. Phlebotomy Clinical Internship Students obtain experience and proficiency in blood collection techniques at a health care facility (80 to 120 hot hours). Prereq: MLS 640. Permission required. Cr/F. 1 to 2 cr.

642. Basic Immunology and Serology Introduces the immunologic basis of selected disease states. Topics include both the innate and acquired immune systems and the specific changes that occur when the immune systems are challenged. 2 cr.

643. Clinical Serology Laboratory Practical experience testing for immune system disorders. Coreq: MLS 642. Permission required. Special fee. 1 cr.

644. Hematology. Blood Cells and Coagulation Human blood cell physiology in both health and disease. Includes all benign and malignant conditions of red blood cells, white blood cells, platelets, and hemostasis factors. 3 cr.

645. Clinical Hematology Laboratory The analysis of whole blood for cellular components and plasma for hemostatic evaluation. Special emphasis on differentiating benign from malignant processes, and cellular identification by morphologic, cytochemical, and CD marker abnormalities. Coreq: MLS 644. Permission required. Special fee. 3 cr.

656. Immunohematology and Transfusion Science The immunology of blood, including blood group systems and the critical role they play in safe transfusion medicine. Additional topics include blood collection, component use, transfusion reactions, and transfusion-transmitted infection. 2 cr.

657. Blood Banking Laboratory Students obtain experience in blood banking practices including blood typing, antibody screening, cross matching, and confirmatory testing. Coreq: MLS 656. Permission required. Special fee. 1 cr.

658. Medical Biochemistry The assessment of disease states through the analytical assessment of amino acids, proteins, enzymes, tumor markers, nonprotein nitrogen metabolites, carbohydrates, lipids, electrolytes, blood gases, hormones, vitamins, and trace elements. Prereq: CHEM 403 and CHEM 404. 3 cr.

659. Clinical Chemistry Laboratory Utilizing analytical methodologies with an emphasis on quality control, students will analyze blood analytes such as glucose, BUN, creatine, electrolytes, enzymes, cholesterol, bilirubin and serum protein and evaluate their clinical significance. Special fee. Coreq: MLS 658. Permission required. 2 cr.

660. Body Fluids The study of diseases and disorders through the analysis of extra-vascular body fluids. Emphasizes renal anatomy and physiology, and diseases and metabolic disorders affecting renal function. 2 cr.


696, 696W. Independent Study In-depth studies under faculty supervision. Prereq: approval of the faculty the area concerned. Cr/F. 1 to 6 cr. 696W is writing intensive.

720. Mycology, Parasitology, and Virology Covers human fungal, parasitic, and viral infections. The mechanism of infection, life cycles, and infectious stages of the organism as well as disease progression within the host. Prereq: MICR 602. 3 cr.

721. Mycology, Parasitology, and Virology Laboratory Practical experience in diagnosing and identifying specific organisms as well as correlating test results with the studied fungal, parasitic, or viral disease. Coreq: MLS 720. Permission required. Special fee. 2 cr.

751/751W. Advanced Clinical Microbiology Internship Advanced clinical bacteriological procedures, fluorescent techniques, and special procedures. Mycology and parasitology identification and testing. Prereq: senior MLS majors only. 5 cr.

752/752W. Advanced Hematology Internship Special hematology procedures including diagnostic staining, advanced hemostasis studies, and evaluation of blood cells in disease states. Prereq: senior MLS majors only. 5 cr.

753/753W. Advanced Immunohematology Internship Advanced blood-banking procedures, including antibody identification, and component therapy. Prereq: senior MLS majors only. 5 cr. 753W is writing intensive.

754/754W. Advanced Clinical Chemistry Internship Theory, operation, evaluation, and maintenance of automated chemistry systems. Advanced laboratory analysis of body fluid chemistry including enzymology, isotopes, hormones, blood gases, and toxicology. Data analysis, computerization. Prereq: senior MLS majors only. 5 cr. 754W is writing intensive.

761/761W. Clinical Microbiology Internship Advanced instruction in clinical bacteriology, mycology, parasitology, and virology at local hospital or reference laboratory. Isolation, identification, and antibiologic sensitivities for common pathogens are emphasized. Prereq: MICR 602; senior MLS majors only. 20 cr. 761W is writing intensive.

762. Clinical Hematology Internship Advanced instruction in hematology and hemostasis at a local hospital or reference laboratory. Specialized tests such as automated cell counts, cytochemical analyses, and specialized hemostasis are covered. Prereq: MLS 652; senior MLS majors only. 20 cr.

763. Clinical Immunohematology Internship Advanced instruction in clinical immunohematology at a local hospital or reference laboratory. Pretransfusion testing, donor screening, phlebotomy and component therapy emphasized. Prereq: MLS 653; senior MLS majors only. 20 cr.

764. Clinical Chemistry Internship Advanced instruction in clinical chemistry at a local hospital or reference laboratory. Analysis of carbohydrates, proteins, enzymes, lipids, hormones, electrolytes, blood gases, and drugs. Prereq: MLS 654; senior MLS majors only. 20 cr.

796. Biomedical Research Internship Advanced instruction/participation in some aspect of biomedical research, either on or off campus. Student designs program of study with research supervisor and MLS faculty advisor. 4 to 16 cr.

799. Senior Honors Thesis 4 cr.

Microbiology (MICR)
(For program description, see page 96.)

407. Germs 101 Expands on the increasing public awareness of the societal and technological impact of the invisible microbial world on our lives and on the planet. Students participate in weekly extra-class activities, acting as life scientists by using the scientific method of inquiry. One experience focuses on bacteria that use sunlight to make a living, another on using bacteria in genetic engineering. Students come to view germs in diverse lights: microbes as organisms, microbes as enemies, microbes as friends, and microbes in the press. Especially useful for people with microphobia. Not for microbiology or biology major credit. 4 cr.

444. From Franklinstein to Dolly, and Beyond This course is an interdisciplinary introductory course designed specifically for first-year students. It seeks to stimulate and support student inquiry and exploration of social and ethical issues associated with scientific research and advances, the value-laden questions that they often precipitate, and their impact on individuals, population groups, and society at large. (Also listed as HMP 444.) 4 cr.

501/501H. Microbes in Human Disease Microorganisms have a profound effect on our everyday lives. This effect can often be dramatic enough to capture much of today's news headlines. Did you ever wonder why people died from eating hamburgers contaminated with E. coli? How do "flesh-eating bacteria" function? Will there be an AIDS vaccine? This course explores the answers to these and many other fascinating questions by examining the role of microorganisms in human disease. The fundamental structure, metabolism, genetics, and ecology of clinically relevant bacteria, viruses, fungi, and parasites and presented in relationship to the human host and its immune system. The foundation, incidence, and control of microbial diseases are presented through case studies. Emphasizes active learning in which students participate in classroom discussions, experiments, and demon-
stratations. Laboratory exercises designed to introduce techniques for the identification of important pathogenic microorganisms and disease diagnosis. Special fee. Lab. 4 cr.

503. General Microbiology
Principles of microbiology; morphology, physiology, genetics, culture, and classification of bacteria and other microorganisms; and their relationships to agriculture, environment, industry, sanitation, and infectious diseases. Prereq: BIOL 411-412 or equivalent; CHEM 403-404 or equivalent. Special fee. Lab. 5 cr.

#504. Brewing and Industrial Microbiology Applications
Lectures and laboratories will address basic concepts of microbiology, chemistry, and biochemistry related to the brewing and food industries. The theoretical and practical approach will serve as an integrative learning experience. A hands-on course for students wishing to learn microbiology and industrial applications and for those working in the field seeking to upgrade their sanitary microbiology skills. Topics will include: bacterial cell wall composition and Gram stain characteristics, the isolation, enumeration, and identification of spoilage bacteria, yeast fermentation and biochemistry, total and viable yeast counts, wild yeast, media selection and preparation and the role of Lactobacilli and Pediococci in beer and other foods. Biochemical testing procedures and the HACCP food safety system will also be emphasized. Prereq: MICR 503 or permission of the instructor. Special fee. 4 cr.

600/600W. Field Experience
A supervised experience providing the opportunity to apply academic experience in settings associated with future professional employment and/or related graduate opportunities. Must be approved by a faculty advisor selected by the student. Prereq: permission. May be repeated to a maximum of 8 credit hours. Only 4 credit hours can be used toward the major. Cr/F. 1 to 4 cr. 600W is writing intensive.

602. Pathogenic Microbiology
Morphologic, cultural, biochemical, serologic, epidemiologic, and pathogenic characteristics of microorganisms causing human and animal diseases. Discussion of clinical presentation in host and laboratory diagnosis and treatment measures. Prereq: MICR 503. Lab. Special fee. 5 cr.

603. Bacteriology of Food
Lectures and laboratories will address modern technical concepts of the microbiology, physiology, and biochemistry related to food sanitation. Theoretical and practical approach serves as an integrative experience. Food sanitation is a serious public health issue in the meat, dairy, fruit, and vegetable industries. Benefits students seeking employment in public health or sanitary microbiology fields. Topics include food as a substrate for microorganisms, causes of food spoilage, food borne disease outbreaks, public health complications, isolation and identification of food spoiling microorganisms, and essentials for food safety and sanitation. Prereq: MICR 503 or equivalent. (Not offered every year.) 4 cr.

604. Bacteriology of Food Lab
This lab addresses modern technical concepts of the microbiology, physiology, and biochemistry related to food sanitation. Coreq: MICR 603. Special fee. 1 cr.

651. Biotechnology Experience/Biomanufacturing
Course begins by introducing students to the proteins and companies of biotechnology and to current good manufacturing practices. For remainder of course, students use cell culture of bacteria, mammalian and yeast cells to produce human proteins using the tools and manufacturing standards, operating procedures of biotechnology, including upstream and downstream processing of proteins, and quality control of protein production. (Also offered as ANSC 651.) 4 cr.

655. Biotechnology Experience/Research
One of two courses that provide students with state-of-the-art tools of biotechnology and an opportunity to master skills and acquire the knowledge needed to work effectively in a biotechnology lab within the industry. Research protocols used in this course illustrate aspects of the "central dogma" of molecular biology. Prereq: BIOL 411, 412, and MICR 503. (Also listed as ANSC 655.) 4 cr.

702. Infectious Disease and Health
Principles underlying the nature of infectious agents; the diseases they cause; pathogenic strategies; response of the host; intracellular parasitism; epidemiology; control measures including vaccines and chemotherapy; action of antimicrobial chemotherapeutic agents; pharmacokinetics and drug metabolism. Ethical issues in infectious disease covered. Well-established pathogens and newer, emerging human and animal disease agents covered. Prereq: MICR 602; permission. (Not offered every year.) 5 cr.

704. Genetics of Prokaryotic Microbes
Study of the maintenance, exchange, and expression of genetic material in bacteria and their viruses. Combines a historical overview on the importance role microbial genetics played in the development of modern molecular biology with a contemporary perspective on the methods used to understand the function of genes. Particular emphasis is placed on current experimental applications to basic science, biomedical research, and biotechnology. (Also listed as GEN 704.) Prereq: MICR 503, BCHM 658. Special fee. 5 cr.

705. Immunology
Introduces the major cellular and molecular components of the immune system; examines their development and production, their interactions with each other and with other systems in the body, and their impact on health and disease. Concentrates on protective and harmful immune responses in humans and animals. Prereq: MICR 503. Special fee. Lab. 5 cr.

706. Virology
Principles of animal and selected plant and bacterial virology in relation to infection and disease. Emphasizes the molecular biology of viruses, viral replication, isolation, propagation, assay, pathogenesis, diagnosis, detection, epidemiology, and control. Prereq: MICR 503. 3 cr.

707. Marine Microbiology
Qualitative and quantitative evaluation of the physiological activities of microorganisms that influence the state of carbon, nitrogen, sulfur, iron, manganese, phosphorous, hydrogen, oxygen, and other elements in the sea and its sediments. Provides an understanding of the interrelationships between marine microorganisms and their surroundings by integrating microbiological phenomena with knowledge of physics, chemistry, and biological oceanography. Introduces students to the primary scientific literature in marine microbiology, teaches each student how to think provocatively and creatively, and convey those thoughts clearly and concisely in both oral and written form. Prereq: MICR 503. Writing intensive. 5 cr.

708. Virology Lab

#710. Electron Microscopy and Microbial Cytology/Electron Microscopy Lab
Ultrastructure of eukaryotes, prokaryotes, and viruses. Role of bacterial appendages, cell membranes and cell walls, cytoplasmic inclusions, cell division and sporulation and virus ultrastructure. Preparative electron microscopy techniques for biological material described in detail. Practical applications of electron microscopy instrumentation together with theory of electron optics, and instrument function discussed. Lab. Prereq: MICR 503; permission. (Not offered every year.) 5 cr.

711. Genomics and Bioinformatics
The methods, applications, and implications of genomics—the analysis of whole genomes. Microbial, plant and animal genomes are addressed, as well as medical, ethical and legal implications. The lab provides exposure and experience of a range of bioinformatics approaches—the computer applications used in genome analysis. Prereq: BIOL 604. (Also offered as BCHM 711 and GEN 711.) Lab. 4 cr.

713. Microbial Ecology and Evolution
Functional roles of microorganisms, their population dynamics and interactions, and their mechanisms of evolutionary change in natural communities, laboratory experiments, and simple mathematical models. Special emphasis on the tempo and mode of prokaryotic adaptation, the evolution of virulence, and the origin of new pathogens. Prereq: MICR 503. 4 cr.

714. Public Health and Waterborne Diseases
Course has three sections: 1) government, 2) disease and epidemiology, and 3) sources of anthropogenic (of human origin) microbial pollution, control and disinfection. The overall theme of the class is to understand how and why waterborne (virus, protozoa, and bacterial) and some food-borne diseases are still prevalent within our society. The class usually goes on at least two field trips, to a wastewater plant and a drinking water plant; at times students may be asked to attend town meetings or public hearings concerning water and pollution. In lab, students do experiments and then analyze their data and share it with the rest of the class by posting it on the class Web site. Prereq: MICR 503. Special fee. 4 cr.

717. Microbial Physiology
Fundamental physiological and metabolic processes of archaea, bacteria and fungi with a strong emphasis on prokaryotes. Literature-based course. Topics include regulation of and coordination of microbial metabolism, bacterial cell cycle, global control of gene expression, diversity of energy metabolism, and microbial cell differentiation. Prereq: MICR 503, BCHM 658 or 751; or permission. Special fee. Lab. Writing intensive. 5 cr.

718. Ethics and Issues in Microbiology
Advances being made in the biological sciences impact the need for scientific integrity. From guiding students in the laboratory to scientific record keeping, from authorship and peer review to potential conflicts of interest, from use of animals and humans in research to genetic technology, scientists need to understand the ethical issues that underlie their work. These and related issues are presented and discussed in a format that encourages both an appreciation of established guidelines and an opportunity to critically examine them. Writing intensive. 4 cr.
751. Cell Culture
Theory and principles fundamental to the culture of cells in vitro. Introduces techniques of preparation and maintenance of animal, plant, insect, and fish cell cultures. Application of cell culture to contemporary research in biological sciences. Prereq: MICR 503; permission. (Also offered as ANSC 751 and PBIO 751. No credit if credit received for MICR 751 of ANSCI 746.) Special fee. Lab, 5 cr.

776. Plant-Microbe Interactions
Physical, chemical, genetic and molecular methods utilized by plant pathogens in interactions with plants, as well as plant defense mechanisms. Major groups of plant pathogens (bacteria, fungi, and viruses) are discussed, as well as beneficial plant-microbe symbioses. (Also offered as PBIO 766.) 3 cr.

Military Science (MILT)

(For program description, see page 119.)

401. Leadership Laboratory I
Open only to students taking another Military Science class, with different roles offered for students at different levels of the program. Involves leadership responsibilities for the planning, coordination, execution, and evaluation of various training programs. Students develop, practice and refine leadership skills by serving and being evaluated in a variety of supervisory positions. Specific events include a team-building leader reaction course, orientation to military weapons, basic tactical movement, and land navigation. Cr/F.

402. Leadership Laboratory II
Open only to students taking another Military Science class, with different roles offered for students at different levels of the program. Involves leadership responsibilities for the planning, coordination, execution, and evaluation of various training programs. Students develop, practice and refine leadership skills by serving and being evaluated in a variety of supervisory positions. Specific events include basic marksmanship, advanced tactical movement, orienteering and land navigation. Cr/F.

413. Introduction to ROTC
Make your first new peer group at college one committed to performing well and enjoying the experience. Increase self-confidence through team study and activities in physical fitness, rappelling, first aid, basic marksmanship, and basic drill. Learn fundamental concepts of leadership in both classroom and outdoor laboratory environments. One hour and a required leadership lab (MILT 401L) plus optional (mandatory for scholarship cadets) participation in three one-hour sessions of physical fitness per week. Participation in one weekend exercise is also required for all cadets. Open to all college students, no military commitment required. 2 cr.

414. Introduction to ROTC II
Learn and apply principles of effective leadership. Reinforce self-confidence through participation in physically and mentally challenging exercises with other ROTC cadets. Continued activities in basic drill, physical fitness, rappelling, first aid, and basic marksmanship. Develop communication skills to improve individual performance and group interaction. One hour and a required leadership lab (MILT 402L) plus optional (mandatory for scholarship cadets) participation in three one-hour sessions for physical fitness per week. Participation in one weekend exercise is also required for all cadets. Open to all college students; no military commitment required. 2 cr.

501. Self/Team Development I
Learn and apply leadership skills that develop individual abilities and contribute to the building of effective teams of people. Develop skills in oral presentations, planning of events, advanced first aid, physical fitness, and land navigation. Learn techniques for training others as an aspect of continued leadership development. Two hours and a required leadership lab (MILT 401L), plus optional participation (mandatory for scholarship cadets) in three one-hour sessions of physical fitness per week. Participation in one weekend exercise is required. Additional weekend exercises may be offered for optional participation. Open to all college students, no military commitment required. Coreq: MILT 401. 2 cr.

502. Individual/Team Military Tactics
Introduces individual and team aspects of military tactics in small unit operations. Includes use of radio communications, making safety assessments, movement techniques, planning for team safety/security, and methods of pre-execution checks. Practical exercises with other ROTC students. Learn techniques for training others as an aspect of continued leadership development. Two hours and a required leadership lab (MILT 401L), plus optional participation (mandatory for scholarship cadets) in three one-hour sessions of physical fitness per week. Participation in one weekend exercise is required. Additional weekend exercises may be offered for optional participation. Open to all college students, no military commitment required. Coreq: MILT 402. 2 cr.

550. Camp Challenge
Five-week leadership training course at Fort Knox, Kentucky; during the summer that exposes students to intensive leadership evaluation and development. Students learn fundamental military skills such as land navigation using a map and compass, principles of leadership, first aid, drill and ceremony, team building exercises, etc. in preparation for future training as ROTC cadets. Students gain professional knowledge in management and organization, and experience group interaction and interpersonal communications through total immersion in a military type environment. Open only to students who have not completed all of the following: MILT 401, 402, 501, and 502. Airfare, lodging, and expenses are paid by the Army. Student incurs no military obligation; program offers opportunities to earn a two-year scholarship and qualifies students to take MILT 601. 4 cr.

601. Leading Small Organizations I
Series of practical opportunities to lead small groups, receive personal assessments and encouragement, and lead again in situations of increasing complexity. Plan and conduct training for other ROTC students in small unit offensive and defensive operations. Three hours and required leadership lab (MILT 401L) plus required participation in three one-hour sessions of physical fitness per week. Participation in one weekend exercise is also required. Other weekend exercises are offered for optional participation. Prereq: Cadet completes MILT 550 or completes MILT 413, 414, 501, and 502. 4 cr.

602. Leading Small Organizations II
Continues the methodology from MILT 601. Analyze tasks; prepare written and oral guidance for team members to accomplish tasks. Delegate tasks and supervise. Plan for and adapt to the unexpected in organizations under stress. Examine and apply lessons from leadership studies. Examine importance of ethical decision making in setting a positive climate that enhances team performance. Three hours and a required leadership lab (MILT 402L) plus required participation in three one-hour sessions of physical fitness per week. Participation in one weekend exercise is also required, and one or two more weekend exercises may be offered for optional participation. 4 cr.

611. Seminar on Leadership and Management I
Plan, conduct and evaluate activities of the ROTC cadet organization. Articulate goals and put plans into action to attain them. Assess organizational cohesion and develop strategies to improve it. Develop confidence in skills to lead people and manage resources. Learn/applying various Army policies and programs in this effort. Three hours and a required leadership lab (MILT 401L) plus required participation in three one-hour sessions for physical fitness per week. Participation in one weekend exercise is also required, and one or two more weekend exercises may be offered for optional participation. Prereq: MILT 601 and MILT 602. 4 cr.

612. Transition to Lieutenant
Continues the methodology from MILT 611. Identify and resolve ethical dilemmas. Refine counseling and motivating techniques. Examine aspects of tradition and law as related to leading as an officer in the Army. Prepare for a future as a successful Army lieutenant. Three hours and a required leadership lab (MILT 402L) plus required participation in three one-hour sessions for physical fitness per week. Participation in one weekend exercise is also required, and one or two more weekend exercises may be offered for optional participation. Prereq: MILT 611. 4 cr.

695. Officer Internship
Experiential learning through fieldwork in a military-type unit. Written analysis required. Prereq: MILT 611 (or both 401L and 402L). By permission. Coreq: MILT 401. May be taken up to a total of 8 credits. 1 to 4 cr.
Music (MUSI)

(For program description, see page 43.)

401/401H. Introduction to Music
Fundamental approach to perceptive listening based on a detailed study of several masterpieces representing different periods and forms. Historical perspective, but main emphasis is on confronting significant works of musical art on their own terms. Some participation in musical life of the University required. Does not fulfill a major requirement. 4 cr.

402, 402H. Survey of Music History
The study of the development of musical styles and idioms in the context of selected historical and cultural aspects of Western civilization. 4 cr.

411, 412. Fundamentals of Music Theory
Elements of music theory for the non-music major; principles of musical structure, analysis, elementary written counterpoint and harmony, and ear training. May not be counted for credit toward a music major. Prereq: ability to read music and permission of the instructor. 4 cr.

441. Concert Choir
A mixed chorus that studies and performs classical and modern literature. Recommended for voice majors. Open to all students. 1 cr.

442. Chamber Singers
A specialized mixed chamber chorus that concentrates on the a cappella repertoire from the Renaissance to the present. Prereq: membership in Concert Choir; audition. 1 cr.

444. Music and Social Change in America
Focuses on music in the United States during the early to mid-twentieth century as it alternately reflected and led movements for social change. Course work consists of listening to selected repertoires, reading scholarly and popular essays about those repertoires, and extensive in-class (and online) discussion about issues raised by the listening and reading. The goal of the course is twofold: 1) to heighten critical listening skills so as to become more aware of ways in which music can express social attitudes; and 2) to introduce the social, cultural, and political issues surrounding the music being studied. Writing intensive. 4 cr.

448. Opera Workshop
Operatic singing, acting, and production techniques; performance of both complete operas and operatic excerpts. Prereq: audition. 1 cr.

450. Symphony
Presents several concerts during the year of repertoire ranging from the great, standard symphonic literature to large modern works. Prereq: audition. 1 cr.

451. Concert Band
The Concert Band performs serious, concert music, ranging from transcriptions of works for other mediums to the 20th century “classics” of the wind band repertoire and music written for wind band. Anyone with previous band experience is welcome. Auditions are for chair placement only. 1 cr.

452. Wind Symphony
Select wind ensemble which performs difficult classical and contemporary literature. Prereq: audition. 1 cr.

453. Symphonic Band
Original band music, transcription, marches, etc. For students whose program does not permit music as a major interest, but who are interested in maintaining their playing proficiency and continuing their study of music. Prereq: audition. 1 cr.

454. UNH Marching Band
Open to all students; performs during football games. Rehearsals conclude at the end of the football season. 1 cr.

455. Piano Ensemble
Drawing from available student instrumentalists and singers, pianists learn the art of performing in trios, duo sonatas, and two-piano works, and gain experience in Lieder accompaniment. 1 cr.

456. String Ensemble
Groups of instrumentalists gain experience in the performance of literature for the smaller ensemble. Prereq: permission. 1 cr.

457. Woodwind Ensemble
Groups of instrumentalists gain experience in the performance of literature for the smaller ensemble. Prereq: permission. 1 cr.

458. Brass Ensemble
Groups of instrumentalists gain experience in the performance of literature for the smaller ensemble. Prereq: permission. 1 cr.

459. Percussion Ensemble
Groups of instrumentalists gain experience in the performance of literature for the smaller ensemble. Prereq: permission. 1 cr.

460. Jazz Band
Two jazz bands perform a wide spectrum of big band literature. Prereq: audition. 1 cr.

461. Vocal Jazz Ensemble
Singers perform in small a cappella ensembles and with various jazz instrumental ensembles. Prereq: membership in Concert Choir; audition. 1 cr.

462. Pep Band
Rehearsal and performance of a broad range of band music at hockey and basketball games. 1 cr.

463. Jazz Combo
Groups of instrumentalists gain experience in the performance of literature for the smaller jazz ensemble. Prereq: permission. 1 cr.

464. Guitar Ensemble
Groups of instrumentalists gain experience in the performance of literature for the smaller jazz ensemble. Prereq: permission. 1 cr.

471-472. Theory I
Introduces the tonal system; species counterpoint; principles of voice leading and harmonic progressions through the analysis, realization, and composition of one-, two-, and four-voiced textures. Concept of triad inversion and consonant diatonic harmonies of the major and minor modes. Students should register for MUSI 473-474 concurrently. Prereq: permission. 3 cr.

473-474. Ear Training I
Laboratory exercises to develop aural skills; sight-singing and dictation. Students should register for MUSI 471-472 concurrently. Prereq: permission. 1 cr.

475-476. Functional Piano I
Basic instruction for music majors with no previous keyboard training. Piano technique, keyboard harmony geared to the practical harmonization of simple melodies, sight reading, transposition, and modulation. May involve both class instruction and periodic short individual lessons. Prereq: permission. Coreq: MUSI 471, MUSI 473. Special fee. 1 cr.

501, 502. History and Literature of Music
Styles, forms, and techniques of composition in Western music. Prereq: completion of MUSI 472 or MUSI 412; permission. 3 cr.

511. Survey of Music in America
From colonial times to the present, including the various European influences, the quest for an American style, and the emergence of such indigenous phenomena as jazz. 4 cr.

515. Survey of Music
The connections between music and other cultural practices and institutions with a focus on the musical traditions and institutions of several cultures. Emphasizes the role of music in society. Examines the materials and methods used to study music and musical life in any culture, as well as concepts in ethnomusicology. Musical training and background not required. 4 cr.

520. Diction for Singers I
Application of International Phonetic Alphabet (IPA) to English, French, German, and Italian. Emphasizes both written and spoken performance. 2 cr.

521. Diction for Singers II
See description for MUSI 520. Prereq: MUSI 520. 2 cr.

536. Early Wind Instruments
Private instruction in Renaissance and Baroque wind instruments. Special fee. 1 to 4 cr.

541. Piano
Private instruction in piano. Special fee. 1 to 4 cr.

545. Voice
Private instruction in voice. Special fee. 1 to 4 cr.

546. Violin
Private instruction in violin. Special fee. 1 to 4 cr.

547. Viola
Private instruction in viola. Special fee. 1 to 4 cr.

548. Violoncello
Private instruction in violoncello. Special fee. 1 to 4 cr.

549. String Bass
Private instruction in string bass. Special fee. 1 to 4 cr.

551. Flute
Private instruction in flute. Special fee. 1 to 4 cr.

552. Clarinet
Private instruction in clarinet. Special fee. 1 to 4 cr.

553. Saxophone
Private instruction in saxophone. Special fee. 1 to 4 cr.

554. Oboe
Private instruction in oboe. Special fee. 1 to 4 cr.

555. Bassoon
Private instruction in bassoon. Special fee. 1 to 4 cr.

556. Bassoon
Private instruction in French horn. Special fee. 1 to 4 cr.

557. Trumpet
Private instruction in trumpet. Special fee. 1 to 4 cr.

558. Trombone
Private instruction in trombone. Special fee. 1 to 4 cr.

559. Euphonium
Private instruction in euphonium. Special fee. 1 to 4 cr.

560. Tuba
Private instruction in tuba. Special fee. 1 to 4 cr.

561. Percussion
Private instruction in percussion. Special fee. 1 to 4 cr.
562. Jazz Piano
Private instruction in jazz piano. Special fee. Permission required. 1 to 4 cr.

563. Jazz Guitar
Private instruction in jazz guitar. Special fee. 1 to 4 cr.

564. Drum Set
Private instruction in drum set. Special fee. 1 to 4 cr.

571-572. Theory II
Continuation of MUSI 471-472. Compositional and analytical work stresses the treatment of dissonance within the tonal system; accessory tones, seventh chords, tonicization, modalization, basic principles of chromatic harmony, and harmonization of chorale melodies are covered. Students should register for MUSI 571-574 concurrently. Prereq: MUSI 472; 474. 3 cr.

573-574. Ear Training II
Laboratory exercises to develop aural skills further. Students should register for MUSI 571-572 concurrently. Prereq: MUSI 472; 474; permission. 1 cr.

575-576. Functional Piano II
See description for MUSI 475. Special fee. Prereq: MUSI 476. Coreq: MUSI 571, MUSI 573. 1 cr.

595. Special Topics in Music Literature
Open to music majors and non-majors; topics in areas not easily covered in historical courses. Prereq: permission. May be repeated for credit. 1 to 4 cr.

570. Music of the Renaissance
Works of the 15th- and 16th-century composers from Dunstable to Palestrina. Prereq: MUSI 501 and 502 or permission. Writing intensive. 3 cr.

605. Music of the Baroque
Music of Europe from de Rore to Bach. Prereq: MUSI 501 and 502 or permission. Writing intensive. 3 cr.

700. Music of the Classical Period
Growth of musical styles and forms from early classicalism through the high classicism of Haydn, Mozart, and the young Beethoven. Prereq: MUSI 501 and 502 or permission. Writing intensive. 3 cr.

709. Music of the Romantic Period
A survey of romanticism in music from Beethoven's late period to the end of the 19th century. The works of Schubert, Berlioz, Schumann, Mendelssohn, Chopin, Wagner, Verdi, Brahms, Austrian symphonists, French pre-impressionists, and national styles in European music. Prereq: MUSI 501 and 502 or permission. Writing intensive. 3 cr.

711. Music of the 20th and 21st Centuries
Styles and techniques of composers from Debussy to the present. Special emphasis on tonal music before World War I, neoclassical trends, the emergence of atonality and serial techniques, electronic music. Prereq: MUSI 501 and 502 or permission. Writing intensive. 3 cr.

715. Survey of Opera
History of the genre from Monteverdi to the present. Prereq: MUSI 501 and 502 or permission. Writing intensive. 3 cr.

731-732. Conducting
Physical aspects, equipment of conductor, fundamental gestures and beats, baton techniques. Reading and analysis of full and condensed scores, study of transposition, psychology of rehearsal. Prereq: MUSI 571. 2 cr.

736. Early Wind Instruments
Private instruction in Renaissance and Baroque wind instruments. Special fee. 1 to 4 cr.

740. Piano
Private instruction in piano. Special fee. 1 to 4 cr.

745. Voice
Private instruction in voice. Special fee. 1 to 4 cr.

746. Violin
Private instruction in violin. Special fee. 1 to 4 cr.

748. Violoncello
Private instruction in violoncello. Special fee. 1 to 4 cr.

749. String Bass
Private instruction in string bass. Special fee. 1 to 4 cr.

751. Flute
Private instruction in flute. Special fee. 1 to 4 cr.

752. Clarinet
Private instruction in clarinet. Special fee. 1 to 4 cr.

753. Saxophone
Private instruction in saxophone. Special fee. 1 to 4 cr.

754. Oboe
Private instruction in oboe. Special fee. 1 to 4 cr.

755. Bassoon
Private instruction in bassoon. Special fee. 1 to 4 cr.

756. French Horn
Private instruction in French horn. Special fee. 1 to 4 cr.

757. Trumpet
Private instruction in trumpet. Special fee. 1 to 4 cr.

758. Trombone
Private instruction in trombone. Special fee. 1 to 4 cr.

759. Euphonium
Private instruction in euphonium. Special fee. 1 to 4 cr.

760. Tuba
Private instruction in tuba. Special fee. 1 to 4 cr.

761. Percussion
Private instruction in percussion. Special fee. 1 to 4 cr.

762. Jazz Piano
Private instruction in jazz piano. Special fee. Permission required. 1 to 4 cr.

763. Jazz Guitar
Private instruction in jazz guitar. Special fee. 1 to 4 cr.

764. Drum Set
Private instruction in drum set. Special fee. 1 to 4 cr.

771, 772. Counterpoint
Contrapuntal techniques of tonal music. Melodic construction and dissonance treatment through work in species counterpoint and studies in harmonic elaboration and prolongation. Analysis of selected compositions emphasizes the connection between fundamental contrapuntal techniques and the voice-leading of composition. Prereq: MUSI 572 or permission. 3 cr.

775-776. Composition
Construction of phrases, periods, and short compositions following classical models. Problems of text-setting. Prereq: MUSI 572 or permission. 3 cr.

777. Advanced Composition
Continuation of MUSI 776. Individual compositional projects. Prereq: MUSI 776 and permission. May be repeated for credit. 3 cr.

779. Orchestration
Characteristics of band and orchestral instruments both individually and in small (homogeneous) and large mixed groupings. Students study scores, write assignments, and have arrangements performed if possible. Prereq: MUSI 572 or permission. 3 cr.

781/781W. Analysis: Form and Structure
Introduces analytical techniques through the study of representative masterworks: formal and structural elements and their interrelationships. Analysis of 18th- and 19th-century works. Prereq: MUSI 572 or permission. 3 cr. 781W is writing intensive.

782/782W. Analysis: Form and Structure
Introduction to analytical techniques through the study of representative masterworks: formal and structural elements and their interrelationships. Analysis of 20th- and 21st-century works. Prereq: MUSI 572 or permission. 3 cr. 782W is writing intensive.

785. Electronic Sound Synthesis
Computers and digital synthesizers, methods of sound synthesis using Csound, MIDI programming in Visual Basic, control programs for synthesizers, notation using computers (e.g., Finale for PC and Macintosh). 4 cr.

795. Special Studies
Music Education (MUED)

(For program description, see page 45.)

#540. Beginning Techniques in Voice
Basic techniques of voice production. Individual work is emphasized. This course is desirable for, but not restricted to, MUED majors. Prereq: permission. 2 cr.

595. Special Projects
Individual investigation, research, or study. Creative projects may be included. Prereq: permission. 1 to 4 cr.

741. Techniques and Methods in Choral Music
Problems in the organization and performance of high school, college, and community choirs. Techniques of choral conducting and rehearsal, repertory and materials. 2 cr.

743. Materials and Methods in Piano Music
Gives potential piano teachers a coherent but flexible approach to the instruction of students of different ages and levels of talent through evaluation of methods and materials and discussion of the role of the private teacher. 2 cr.

745, 746. Techniques and Methods in String Instruments
Class and individual instruction. Intensive training on the violin, viola, cello, and double bass. Classroom procedures, establishment of string programs, and evaluation of available methods materials. Permission required. 2 cr.

747. Techniques and Methods in Woodwind Instruments
Basic course in embouchure formation, tone production, tonguing, fingering and instrument care as applied to each of the woodwinds: flute, oboe, clarinet, bassoon and saxophone. Methods, studies, solos, and ensembles most useful with school players of woodwind instruments. Permission required. 2 cr.

749. Techniques and Methods in Brass Instruments
Basic course in embouchure formation, tone, tonguing, fingering, flexibility, accuracy, and range development as applied to the trumpet or baritone horn, French horn, and trombone. Methods, studies, solos, and ensembles most likely to be useful with school players of brass instruments. Permission required. 2 cr.

751. Techniques and Methods in Percussion Instruments
Basic performance skills on snare drum, timpani, mallet instruments, and other percussion instruments used in bands and orchestras. Materials and methods of instruction. Permission required. 2 cr.

755. Vocal Pedagogy
A study of vocal anatomy, vocal function, and teaching methods, with an emphasis on application for singers and voice teachers. 2 cr.

763. Jazz Music Methods
Organization and delivery of instruction in jazz. Historical development of jazz styles and the role of each instrument/voice in jazz combos and large ensembles. Reading jazz notation and teaching improvisation. Examination of appropriate literature. Prereq: piano proficiency. Permission required. 2 cr.

765. Instrumental Music Methods
Organization and delivery of instruction to groups of instrumental music students. Examination of appropriate curricula and materials, application of instrumental and conducting techniques, structure of rehearsals, assessment of student progress. Prereq: junior standing. 2 cr.

771. Marching Band Methods
Role of marching band in the school music program. Design and execution of field shows and parade marching. Understanding of marching percussion and auxiliary units. Examination of appropriate music. Prereq: MUSI 454 and 571. 2 cr.

790. Teaching Elementary School Music
Experiential approach toward learning creative strategies for teaching elementary school music. Includes various curricula and methods; philosophy and psychology of music; demonstration of materials and instruments. Observation and teaching in schools. Prereq: piano proficiency. 3 cr.

791. Teaching Secondary School Music
Assembling, managing, and teaching junior/senior high school music curriculum. Academic issues of philosophy, curriculum building, application of learning theories, administration, evaluation, motivation, and classroom management combined with field experience in lesson planning and teaching/ rehearsal techniques. Prereq: piano proficiency; MUSI 731-732. 2 cr.

795. Special Studies
Allows upper-level students to explore individually or in groups areas related to their specific professional interests. Prereq: permission. 1 to 4 cr.

Natural Resources (NR)

400. Professional Perspectives in Natural Resources
Lectures by departmental faculty provide an informal look at the various natural resource disciplines and professions represented by the Department of Natural Resources. These presentations acquaint students with our faculty and inform them of some of the exciting research being undertaken in the department. Students also learn of opportunities for professional involvement. Required for all first-semester Natural Resources majors. Cr/F. 1 cr.

401. Introduction to Natural Resources
Overview of the history, politics, economics, ethics, and ecology involved with the conservation and management of living and non-living natural resources. Sets the stage for subsequent natural resource courses by introducing the scientific basis for natural resource conservation and management. Labs build confidence in map and compass work and provide hands on field experience within the various natural resource disciplines. Debates and discussions of natural resource related hot topics provide opportunities to practice public speaking, problem solving, and critical thinking skills. Permission. Lab. Special fee. 4 cr.

410. Insects and Society
Insects have had a major impact on human culture throughout the centuries as source of food, an inspiration in literature and art, and a driving force behind social change. We study basic insect biology and ecology with a focus on their relationships to humans. Special fee. Lab. 4 cr.

415/415H. Global Biological Change
Introduces the biological aspects of global change. Includes historical and physical setting and emphasizes current global biological issues including population growth, land use and deforestation, biodiversity loss, introduced species, industrial N fixation, changes to the carbon cycle, and important interactions between the biosphere atmosphere. 4 cr.

425. Field Dendrology
Students study forest trees in natural communities and urban settings. Identification and nomenclature of important North American trees and shrubs is emphasized. Environmental factors influencing tree growth, combined with study of disturbance history, provide the context for understanding why tree species grow where they do. Students are introduced to the major forest regions of North America. Restricted to NR majors; others by permission. Special fee. 4 cr.

426. Wood Science and Technology
Wood microstructure and identification: physical, chemical, and mechanical properties; characteristics of wood including those produced by growth rings, knots (ring, cross-grain) and those produced by degradation (e.g., stain, decay); focused on native and local species of both softwoods and hardwoods; and the role of forests in carbon storage. Special fee. Lab. 4 cr.

433. Wildlife Ecology
Historical, biological, ecological, and sociological factors influencing the wildlife resource and its management. Concepts in populations, communities, habitat, and contemporary wildlife issues. Special fee. Lab. 4 cr.

435/435H. Contemporary Conservation Issues and Environmental Awareness
Explores the impacts of technology and human activity on our environment and natural resources. Key conservation issues are used as examples of past and present biological, social, and environmental conflicts. 4 cr.

444. Endangered Species: A Bio-political Crossroad
A freshman inquiry course that provides students with a multidisciplinary perspective of endangered species management in the United States. The sociological, economic, and biological forces that influence policy and management of endangered species are explored with guest lectures, student-led discussion, and case-study student seminars. Writing intensive. 4 cr.

444A. How to Change the World: Engaging Students and Community Partners in Collaborative Research
Explores students to the breadth of research opportunities at UNH, and engages them in collaborative research projects to develop and disseminate new knowledge broadly for the benefit of society. Through an integrated series of lectures and highly interactive work sessions, students will learn the emerging foundations and examples of Outreach Scholarship, are paired with a community partner to develop a research proposal in an area that interests them, and learn critical professional skills including proposal writing and presentation. 4 cr.

444B. The Real Dirt
Explores sustainable agriculture, regional and local food supply and systems, land ethics and agrarian thought as a natural resource and environmental conservation issue. Focusing on northern and central New England, the course uses the teaching of Aldo Leopold and includes hands-on study of UNH's new initiatives in sustainable and organic agriculture and the on-campus food system. A visit to University farms is included. Writing intensive. 4 cr.
501. Introduction to Soil Sciences
An overview of physical, chemical, and biological properties of soil. Sub-disciplines of soil chemistry, soil physics, soil microbiology, soil genesis, and classification. Prereq: CHEM 403 or equivalent. Special fee. Lab. 4 cr.

502. Forest Ecosystems and Environmental Change
Forest ecosystems cover a large fraction of the Earth's land surface and account for most of its terrestrial biological productivity. This course introduces forest ecosystems around the world and explores both the natural processes that regulate them and the environmental factors that cause change over time. Topics include tree growth strategies, succession, change, nutrient cycling, and human-induced stressors such as air pollution and climate change. Special fee. 4 cr.

504. Freshwater Resources
Major determinants of freshwater resources including hydrologic cycle and water balance, precipitation, stream-flow measurement, pollution, water supply and sewage treatment, water resource management, and regulation. Special fee. Lab/field trips. 4 cr.

506. Forest Entomology
Introduces insect biology, behavior, ecology, and control, focusing on the forest environment. Labs include identification to the family level and an insect collection. Special fee. Lab. Writing intensive. 4 cr.

527. Forest Ecology
Introduces basic and applied ecology of forests, with emphasis on ecosystem processes, including water, energy, and nutrient cycles; biological interactions, including biodiversity and plant-plant, plant-animal, and plant-microbe relationships; and human impacts, including forest management, land-use/land cover-change, and changes in atmospheric chemistry. Prereq: PBIO 412 or BIOL 411. Permission. Special fee. Lab. 4 cr.

542. Forest Inventory Measurement and Mapping
Elementary measuring equipment and techniques; preparation of maps; public land survey; courthouse deed search. Two-week field session following spring semester. (Forestry and Wildlife majors only). Special fee. 2 cr.

544. Forest Biometrics
Sampling techniques basic to forest inventory, regression estimation used in deriving volume equations and predicting forest growth and yield. Field labs include plot and point sampling. Analyses made using microcomputers. Special fee. Lab. 3 cr.

599. Work Experience
Work in the field of forestry; must be performed under professional supervision or approved by natural resources faculty. Students are responsible for arranging their own experience. Restricted to Forestry majors. Permission. Cr/F.

601. Environmental Conservation and Sustainable Living Internship
Practical internship and field experience in a location removed from the University milieu to give the environmental conservation student a dimension and insight into sustainable resource management systems not available in the campus experience. Prereq: permission. Cr/F. 4 cr.

602. Natural Resources and Environmental Policy
Contemporary natural resource and environmental policy problems/issues are addressed from a policy sciences perspective with emphasis on domestic policy solutions. Critical assessment of major policy initiatives and their implementation toward sustainable resource use and a healthy environment. Public policies are analyzed to determine the extent to which their implementation strategies have succeeded, and to assess their adequacy within a bioregional or ecosystem approach, and/or capacity to integrate economic and environmental decision-making. Cases include national and local policies in their global context. Students apply public policy analysis and decision tools in laboratory sessions. Prereq: junior/senior; permission. Special fee. Writing intensive. 4 cr.

604. Watershed Hydrology
Basic principles underlying the physical processes of water movement at the watershed scale. Topics include precipitation, soil infiltration, stream flow, open channel hydraulics, and groundwater movement. Labs consist of problem sets and field trips in which hydrological processes are quantified. Prereq: NR 504 and one semester of calculus. Special fee. Writing intensive. 4 cr.

607. Soil and Land Evaluation
Field and lecture course emphasizing application of USDA Soil Taxonomy and Soil/Land-use interpretations to soils, landscapes, parent materials. Students gain on-site practice in preparing detailed soil descriptions, classifications, and interpretations, and participate in collegiate soil judging meets. Prereq: NR 501. Special fee. Lab. 2 cr.

#610. Coastal and Oceanic Law and Policy
Intended for persons interested in knowledge of or careers in management of marine or coastal resources, or in the natural sciences. Focuses on policy issues affecting oceans and coastlines and the tools available to government and policy leaders for coping with those issues. Issues examined include: 1) international concerns about control of coastal waters and access to resources of the water column and ocean floor; 2) water pollution and contamination of ocean resources; 3) protection for threatened and endangered species, including depleted fisheries; and 4) environmental impacts of the development and use of coastal areas. The legal tools and policy options available to government officials and concerned citizens for addressing these issues and controversies are examined. Class discussions on the status and history of applicable laws are accompanied by the analysis of policy concerns and the efficacy of various legal techniques. Students work in teams to develop strategy and to research positions in preparation for a negotiation exercise and a mock hearing. (Offered Summers at the Shoals Marine Laboratory.) 2 cr.

615. Wildlife Habitats
Introduces animal-habitat associations, including an examination of spatial and temporal features of wildlife habitat, the evolution of habitat selection, and how habitat suitability/productivity is evaluated. Prereq: woody plant identification; limited to wildlife management majors and minors. Permission. Special fee. Writing intensive. 4 cr.

621. Field Descriptions of Soils
Description of soils in the field. Application of soils properties to forestry, plant science, and community planning. Strong orientation to fieldwork. Special fee. Lab. 3 cr.

629. Silviculture
Application of ecological knowledge to the control, establishment, composition, and growth of forest stands for economic purposes. Prereq: NR 423 and 527. Special fee. Lab. 3 cr.

636. Wildlife Techniques
Introduces research design principles, protocols, and techniques for monitoring and managing wildlife populations. Labs examine techniques for monitoring a variety of vertebrate taxa. Prereq: one course in general ecology and statistics. Weekend field trips may be required. Limited to Wildlife Management majors and minors. Permission. Lab. Special fee. Writing intensive. 4 cr.

637. Practicum in Environmental Conservation
Enriches student participation in an environmental conservation activity in the area of the student's specialization. Individual or group projects may be developed under the supervision of an faculty member within or outside natural resources or with supervisors in public and private agencies, upon approval of the course instructor. Research projects not acceptable. Prereq: senior standing in the environmental conservation program. Cr/F. 4 cr.

643. Economics of Forestry
Intermediate-level analyses of supply and demand for forest-based goods and services, managerial economics, taxation, capital investments. Prereq: EREC 411 or ECON 402. 4 cr.

650. Principles of Conservation Biology
Examines the major issues relevant to conservation of biodiversity from the genetic to the ecosystem level. In addition to addressing ecological and biological principles, the interdisciplinary nature and challenges of managing for conservation biology, including the role of economic and social factors are examined. Prereq: one semester of biology, botany, or zoology. 4 cr.

652. Forest Resources Assessment
Aerial photo type mapping and forest resources inventory: type identification and delineation, map construction, cruise design, and forest resources inventory. Two-week field session following the spring semester. (NR majors, others by permission.) Prereq: NR 527 and 544. Special fee. 2 cr.

655. Vertebrate Biology
Introduces the diversity and evolution of vertebrates. Topics span the morphological, physiological, behavioral, and ecological diversity among the major vertebrate taxa. Labs stress identification of vertebrate taxa based on specimens and morphological structures. Permission. Prereq: BIOL 411; 412; or equivalent. Special fee. Lab. 4 cr.

658. Introduction to Geographic Information Systems
Introduces the use of geographic information systems (GIS) for natural resources and related fields. Data models/structures, map projections, data input/output/storage, data analysis/modeling, interpolation, and data quality/standards. Hands-on lab using ArcView 3.x GIS software. (Also offered as GEOG 658). 4 cr.

660. Ecology and Biogeography of New Zealand
Covers the principles of ecology and biogeography, with a distinct focus on New Zealand. Students investigate the processes that have shaped the New Zealand landmass and its biota. Impact of human settlement on New Zealand's ecosystems is explored in-depth. Methods and techniques of scientific research are incorporated in this course. Field exercises focus on topical case studies in a variety of ecosystems and are designed to strengthen students' conceptual knowledge, enable students to apply this knowledge, as well as develop field skills including classification systems, mapping, habitat
assessment, field identification, and sampling techniques. Prereq: junior/senior permission. Coreq: NR 661, NR 662, and NR 663. Special fee. 3 cr.

661. Restoration Ecology and Ecosystem Management in New Zealand
Current restoration projects and strategies for management of natural resources in New Zealand form the framework for this course. Solving problems related to introduced species, changes in habitat, the preservation of ecological processes and watershed management are the major foci of this course. Management of resources for multiple uses, as well as primary and extractive industries is included. Field exercises focus on tropical case studies in a variety of terrestrial and coastal-marine ecosystems and include the identification of habitats and communities, stresses on the environment, and risk analysis. Prereq: Coreq: NR 660, NR 662, and NR 663. 4 cr.

662. Environmental Policy, Planning and Sustainability in New Zealand
Introduces students to politics in New Zealand. Investigating policy pathways and planning forms part of the curriculum. Students assess scope of legislation, including the Resource Management Act (1991), for the economic and socio-political environment in New Zealand. Government obligations to the Treaty of Waitangi, and customary uses of resources are examined as part of this course. Students are exposed to diverse perspectives of local authority planners and policy makers, local iwi (tribes), the Department of Conservation, and community groups. Students examine case studies involving the resource consent process at several levels of decision-making. Case studies provide a comprehensive overview of the interactions between the environment and people and their cultural and socio-economic needs. Prereq: junior/senior; permission. Coreq: NR 660, NR 661, and NR 663. 3 cr.

663. Applied Directed Research in New Zealand
Working closely with faculty, student teams investigate selected ecological, resource management or policy issues. All projects have scientific and social components that contribute to ongoing/existing projects in the region. Students use the scientific method to design and carry out their projects. Development of rigorous field investigations, experimental design, data analysis, and scientific writing are emphasized. Students prepare a research report and present their findings in a seminar that includes stakeholders and people from the local community. Prereq: junior/senior; permission. Coreq: NR 660, NR 661, and NR 662. Writing intensive. 4 cr.

665. Applied American Environmental Philosophy
Applying the philosophical theory underlying environmental studies and approaches to environmental conservation. Students conduct critiques of extensive readings and write papers creatively analyzing aspects of selected philosophical works. Major research manuscript required. (Also offered as AMST 665.) Writing intensive. 4 cr.

#670. Forest Fire Protection
Forest fire prevention, behavior, and effective control; weather phenomena; other aspects of forest damage; fire effects and use. Prereq: NR 527 or 629; NR 501. (Not offered every year). Special fee. Lab. 2 cr.

765. CEOP (Community Environmental Outreach Program) Projects
Matches students with an interest in environmental issues with community groups with environmental problems to be addressed. Students form consulting teams of from two to four students to work with the community during the academic year. (May be repeated for a maximum of 4 credits.) Prereq: permission. Cr/F. 2 to 4 cr.

701. Ecological Values and Ethics
Deeper more fundamental philosophical questions, including spiritual values questions, are being asked concerning the ecological/environmental challenge of our time; its causes and resolution. Aspects of this challenge: environmental education, energy, food, agriculture, and natural resources—analyzed with ethics and values approaches. Students develop ways of responding to problem identification and resolution. Writing intensive. 4 cr.

702. Workshops
Short-term courses (generally a few days to two weeks) offered off campus, covering a broad variety of environmental and natural resource topics. May be repeated. Special fee required depending on supplementary materials provided. Prereq: permission. Coreq: 1 to 4 cr.

703. Watershed Water Quality Management
Principles of land use as they relate to water quality and quantity. Lectures focus on biogeochemical cycles and the watershed approach to land and water resource management. Labs and field trips focus on methods of water sampling and analysis. One year of chemistry is recommended. Prereq: NR 504 or 604 or permission. Special fee. Lab/field trips. Writing intensive. 4 cr.

706. Soil Ecology
Examines the ecological relationships between soil microorganisms and their biotic and abiotic environment, with emphasis on the role of soil microorganisms in biogeochemical cycling. Specific objectives are to examine the biodiversity present in soil systems, factors controlling microbial community composition and diversity, and linkages between soil microbial communities, soil physical properties, and soil organic matter and nutrient cycling dynamics. Prereq: BIOL 412 or PBIO 412, CHEM 403, or equivalent, or permission. Special fee. Lab. 4 cr.

710. Endangered Species Seminar
Provides students with an interactive class of student presentations and guest lectures by endangered-species biologists. Emphasizes on biological, sociological, economic, and political factors that influence endangered-species policy. Prereq: basic ecology/biology; permission. Special fee. 2 cr.

711. Wetland Ecology and Management
Analysis of the natural resources of coastal and inland wetlands and environmental problems caused by human use and misuse of these ecosystems. Groups collect field data to summarize the structure and function of four wetland types within a management context. Special fee. Lab. Prereq: BIOL 541, or NR 703, or permission. Writing intensive. 4 cr.

713. Quantitative Ecology
Applied quantitative techniques: basic concepts and probability and statistics applied to ecological systems, population dynamics, spatial patterns, species abundance and diversity, classification and ordination, production, and energy and nutrient flow. Additional credit for in-depth mathematical analysis of a particular topic. Prereq: intro. courses in calculus, statistics, and ecology. (Not offered every year.) Writing intensive. 4 cr.

716. Wetland Delineation
Examines the soils, vegetation, and hydraulic functions of coastal and central New England wetlands. Students are responsible for the collection and identification of aquatic plant species, description of wetland soils, and delineation of wetland boundaries. Lectures and fieldwork. For juniors, seniors, and working professionals. Field trips. Special fee. (Offered summer session only.) 4 cr.

718. Law of Natural Resources and Environment
Federal and state environment statutory and administrative law, its application, strengths and weaknesses, and options for future amendment. 3 cr.

719. Wetlands Restoration and Mitigation
Assesses the problems of wetlands loss and learning how to repair the damage. Asks what steps can be taken. Does restoration work, can habitat value be replaced, what constitutes equivalent mitigation? Field experience and theoretical background in restoring marine and freshwater environments. First half of course involves field trips to visit and sample mitigation and restoration sites. Second half focuses on student projects using the scientific method to address wetlands issues. Prereq: NR 711 or permission. Special fee. Lab/field trips. (Not offered every year.) 3 cr.

Students examine policies for managing human activities to sustain the health of regional ecosystems and planetary life-support systems. Selected problems of the international commons (oceans, marine resources, atmosphere, migratory species); global and regional carrying capacity (population, resource consumption), internationally shared ecosystems (transboundary watersheds and waterbodies, tropical forests); and the relevant international institutions and politics for policy formation, conflict resolution, and implementation. Using a policy-analytic framework, students develop case studies to assess international policies and institutional arrangements to achieve the objectives of Agenda 21—Earth Summit Strategy to Save the Planet. Prereq: permission. Writing intensive. 4 cr.

721. Ecology of Polluted Waters
Impact of various water quality problems (e.g., excessive nutrient loading, organic matter loading, contamination by trace organic compounds) on the ecology of fresh waters, including microorganisms, aquatic invertebrates, algae, and fish. Design of experiments and assessment of statistical and data interpretation. Prereq: NR 703 or BIOL 528 or BIOL 541. Special fee. Lab/field trips. Writing intensive. 4 cr.

724. Resolving Environmental Conflicts
Theories and practices of environmental dispute settlement. Roles of public, non-governmental and governmental organizations. Effectiveness of public participation initiatives in influencing public policy decisions and/or resolving environmental conflicts. Alternative approaches to consensus (policy dialogues, joint problem solving; strategic planning; negotiation, mediation) as well as litigation. Specific cases are critiqued and evaluated; conflict resolution skills are developed. Students observe and/or participate in ongoing local decision processes. Prereq: second-semester juniors, seniors; permission. Lab. Writing intensive. 4 cr.

725. Environmental Communications and Advocacy
Principles and techniques of communication and policy advocacy as applied to selected environmental issues. Case studies of regional, national, and international importance are pursued within a seminar-workshop format in which students learn content analysis skills to critically examine practical constraints on communication about environmental issues within complex political environments.

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474. Biogeochemistry
Examines the influence of biological and physical processes on elemental cycling and geochemical transformations from the molecular to the global scale, involving microorganisms, higher plants and animals which are ecosystems; factors that regulate element cycles including soils, climate, disturbance and human activities; interactions among the biosphere, hydrosphere, lithosphere, and atmosphere; transformations of C, N, S, and trace elements. Prereq: one semester biology and two semesters of chemistry or permission. 4 cr.

745. Forest Management
Forest land ownership, management objectives, forest inventory regulation and policy, forest administration, professional responsibilities and opportunities. Restricted to Natural Resources majors. Lab. Special fee. 4 cr.

757. Photo Interpretation and Photogrammetry
Practical and conceptual presentation of techniques for using remote sensing, specifically aerial photographs, in natural resources. Includes photo measures of scale, area, parallax and object heights; interpretation of reflection, refraction, and the electromagnetic spectrum; and photo interpretation and mapping. Concludes with an introduction to digital remote sensing including multispectral scanners, radar, and thermal imagery and a brief discussion of geographic information systems (GIS). Applications to forestry, wildlife, land-use planning, earth sciences, soils, hydrology, and engineering. Prereq: algebra. Special fee. Lab. (Also offered as GEOG 757) 4 cr.

759. Digital Image Processing for Natural Resources
Introduces digital remote sensing including multispectral scanners ( Landsat and SPOT), radar, and thermal imagery. Hands-on image processing including filtering, image display, ratios, classification, registration, and accuracy assessment. GIS as it applies to image processing. Discussion of practical applications. Use of ERDAS image-processing software. Knowledge of PCs required. Prereq: NR 757 or equivalent and permission. (Also offered as GEOG 759.) 4 cr.

760. Geographic Information Systems in Natural Resources
Theory, concepts, and applications of geographic information systems (GIS) for use in natural resources and related fields. Discussion of database structures, sources of data, spatial data manipulation/analysis/modeling, data quality standards and assessment, and data display/map production including many examples and practical applications. Hands-on lab exercises using ArcGIS 8.x software. Permission. Lab. (Also offered as GEOG 760) 4 cr.

765. Community Ecology
Properties of biotic communities, especially biodiversity. Effects of physical stress, disturbance, competition, predation, positive interactions, and dispersal on community properties. Community dynamics, including succession and stability. Prereq: applied biostatistics and general ecology. Lecture and discussion. 4 cr.

767. Earth System Science
Introduces the study of Earth as an integrated system. Investigates the major components (e.g., atmosphere, biosphere, cryosphere, hydrosphere, and lithosphere), dynamics (e.g., energy balance, water cycles, biological cycles, and change), and interactions within the earth system. Emphasizes the interactions and feedbacks within the system. The links between components are presented by examining present day processes and selected events in Earth's history. The lab portion examines these concepts through the development and use of computer models of Earth system processes. Prereq: MATH 424B, MATH 425; or permission. Lab. (Also offered as ESCI 767) 4 cr.

780. Earth as a System for Educators
Explores the Earth as a system. Topics include ecosystems, habitats, biomes, biodiversity, weather, climate, water and air (environmental) quality, watersheds, remote sensing, the flow of matter and energy through the universe, water and nutrient cycles, wildlife identification and monitoring, wetlands, desert ecosystems, and changes over time. Course focuses on content being taught through Project WILD, WET, Learning Tree and Project HOME activities. The GLOBE protocols are an integral part of all lab exercises, and provide an opportunity to learn science methods and content through the use of classroom friendly techniques used to integrate into units for elementary and middle school students. For elementary and middle school teachers. Permission. 4 cr.

782. Monitoring Forest Health
Provides the field and remote sensing tools and experience needed by students to assess forest conditions at the individual tree and stand levels, as well as to conduct independent research projects on specific topics of interest. May include assessing change-over-time, landscape-level impacts of urban developments, severe weather events, and other natural and anthropogenic perturbations affecting the health of forests. Forest damage due to insects, air pollution (primarily ground-level ozone), drought, the 1998 ice storm, and others are investigated. Lab. Special fee. Permission. 4 cr.

783. Forest Communities of New Hampshire
A hands-on field course designed to introduce students to the diverse forest community types of New Hampshire. Topics include 1) field identification of forest types using different classification systems and keys; 2) identification of characteristic plant and animal species; 3) the roles of climate, geology, soils, natural disturbance, forest management, and biotic factors in determining forest community type; 4) primary and secondary successions, including old-growth. Prereq: one course in ecology or environmental biology or permission. Special fee. 4 cr.

784. Sustainable Living
Concepts of sustainability are explored in a learning-communitiy format. The importance of human communication, sense of place and time, and the health and longevity of the human species as part of natural systems is emphasized. Students develop measures for sustainable living, including ecological footprinting, and gain an understanding of system conditions necessary to move toward sustainable living. Two required field trips. Special fee. 4 cr.

785. Systems Thinking for Sustainable Living
Introduces students thinking from a sustainable living perspective. The course is a collaborative inquiry using a problem-solving approach. After studying different types of systems and learning a variety of tools useful in systems analysis, we ask, "In what ways can systems thinking be employed to understand and begin to resolve the complex problems that face us as we move toward living within limits of natural systems?" 3 cr.

795/795W. Investigations
Investigations in Natural Resources may include topics in environmental conservation, forestry, soil and watershed management, ecosystems, and wildlife management. Permission required. 1 to 4 cr. 795W is writing intensive.

797. Special Topics
An experimental course for the purpose of introducing a new course or teaching a special topic for a semester in an area of specialization in natural resources. Permission required. Special fee on some sections. 1 to 4 cr.
Nursing (NURS)

(For program description, see page 79.)

501. Introduction to Nursing
Examines the values and philosophy of the Department of Nursing. Explores the four domain concepts of nursing: health and how it is defined, the diverse clients served by nursing, nursing as a profession, and the complex environment within which nursing is practiced. The nature of nursing client encounters is explored with an emphasis on teaching students the skills to interact in a caring, facilitative manner. Prereq: permission. Special fee. 4 cr.

502. Concepts of Pathophysiology/Pharmacology
Focuses on concepts of pathophysiology/pharmacology relevant to nursing practice. The physiologic response and manifestations of alterations in normal body functioning are analyzed and the effects of pharmacological agents on these alterations are examined. Prereq: ZOOL 507-508; MIRC 501; majors only. Special fee. 4 cr.

508. Foundations of Nursing Judgment
Focuses on the knowledge and analytical skills required to adequately assess the health status of individuals. Students learn how to collect data using an assessment framework, analyze the data, and identify client resources and problems. Emphasizes the implications of the individual’s developmental status, culture, and biologic variations at all points in the assessment process. Prereq: ZOOL 507-508; NUTR 400; MIRC 501; PSYC 401; NURS 501; majors only. Coreq: NURS 502, NURS 514. 4 cr.

514. Techniques of Clinical Nursing
Focuses on the acquisition of psychomotor and assessment skills required for the delivery of safe nursing care. Students begin by learning clinical skills in the simulation setting and then using those skills with supervision in the clinical setting. An additional focus of this course is understanding fundamental nursing concepts as they pertain to providing safe, effective care. Prereq: ZOOL 507-508; NURS 501; majors only. Coreq: NURS 508. Lab. Special fee. 4 cr.

535. Death and Dying
Encompasses peoples’ responses to death throughout the lifecycle. Theories of death, dying, and grieving discussed. Students explore cultural influences, legal, and ethical dilemmas; the biopsychosocial needs of people facing life-threatening situations; resources for care of the dying; death rituals; and surviving a major loss. Writing intensive. 4 cr.

595. Women’s Health
Examines women’s health and women’s health care from historical, political, and social perspectives. Discussion of societal and health-care constraints that hinder women from achieving their full health potential. Also presents information on women’s health care practices, including the concept of self-care, and relates this to development of educated consumerism in the health-care system. 4 cr.

606. Seminar on Professional Nursing
The role of health professionals from historical, social, political, economic and technical viewpoints. Individual student examinations of values, attitudes and beliefs regarding professional role in relation to current nursing theory and practice. Open to RN students only by permission. Prereq: NURS 646. Writing intensive. 7 cr.

613. Adult Health Nursing
Addresses the professional nursing practice, decision making processes, strategies and interventions as they relate to the care of adults who are experiencing chronic illnesses, acute illnesses, or impending death. The perspective adopted emphasizes the functional issues of daily living that these illnesses impose and the meanings these illnesses have for adults and their families within cultural, socioeconomic, sociopolitical, physical, and personal contexts. Prereq: first semester junior nursing major. Prereq: NURS 502, 508, 514. Coreq: NURS 615C. Special fee. 4 cr.

615C. Adult Health Nursing Clinical
Prereq: NURS 502, 508, 514. Coreq: NURS 615. 4 cr.

617. Nursing and Healthcare Policy
Examines the nature and quality of health care delivery systems and health related social programs from a nursing perspective. Critical thinking skills and strategies needed by professional nurses to participate in health care planning and health care consumer advocacy for improved health services emphasized. Prereq: for RNs with at least one year of clinical experience or permission. 3 cr.

618. Caring for People with Alterations in Mental Health
Provides an understanding of the concepts of mental health and major factors affecting human behavior and interaction. Specific theoretical concepts guiding nurse-client interactions are used as a framework for personal and family’s optimum state of well-being. Prereq: NURS 662. Coreq: NURS 618C. 2 cr.

618C. Caring for People with Alterations in Mental Health
Emphasis on the practice of psychiatric nursing as being grounded on certain empirical, aesthetic, personal, and ethical knowledge. Nursing process and a situation-based interpretive approach serve as a framework for professional action. Through a variety of clinical experiences, the student applies mental health concepts/principles of interaction. Prereq: NURS 622. Coreq: NURS 618, NURS 624C. 2 cr.

619. Clinical Decision Making I
To practice effectively nurses must be able to gather data, interpret its meaning, take actions based on an understanding of the data, and evaluate outcomes. They also must be aware of the processes used to make judgments and be prepared to revise, adapt, or reject them. The course focuses on teaching learning theory, ethical decision making, and helping clients and families deal with situational and maturational crises, using a critical thinking framework. Prereq: first-semester junior nursing majors; NURS 501; 502; 508; 514. Coreq: NURS 615. Writing intensive. 4 cr.

620/620C. Caring for the Childbearing and Childrearing Family
This course has family as the focus for nursing practice, introducing the student to the care of young families throughout preconception, birth and child-rearing periods. Healthy transitions and physical alterations occurring from conception through adolescence are examined. The health needs of the family are discussed in terms of major morbidity/mortality and contemporary issues. Experience in various clinical settings provides opportunities for the development of professional practice roles. Prereq: second semester junior nursing major. Coreq: NURS 620C. Special fee. 4 cr.

622. Clinical Decision Making II
Emphasizes the clinical decision making process in the nursing care of individuals, families, and communities across the lifespan and from diverse backgrounds. Builds upon the theoretical foundation developed in 619, Clinical Decision Making I. Students strengthen expertise in developing clinical judgments, interventions, and outcome evaluations. Skills predicated upon attending to and processing relevant information from clinical situations. Students apply knowledge from clinical nursing courses in a variety of ways. Prereq: second-semester junior nursing majors; NURS 619; or RN student. 4 cr.

624. Nursing in the Community
Explores the role of the community health nurse in health promotion, disease prevention, and long-term care. Analyzes contemporary community health problems with implications for community health nursing. Explores a variety of clinical and population-focused roles in primary, secondary, and tertiary prevention of health problems. Prereq: second semester junior nursing major. Coreq: NURS 624C. Special fee. 2 cr.

624C. Nursing in the Community
Coreq: NURS 618C, NURS 624. Special fee. 2 cr.

645/645W. Research
Focuses on enhancing the student’s ability to evaluate, read, comprehend, and participate in, and apply research to the practice of nursing. Pre or Coreq: statistics. 4 cr. 645W is writing intensive.

655. Community Health Nursing I
Explores role of community health nursing in health promotion, disease prevention and long term care at the population level. Identifies population at risk and implications for aggregate level nursing care. Open to RN students only by permission. Prereq: NURS 606. 3 cr.

656. Community Health Nursing II: Individuals, Families, and Aggregates
Explores a variety of contemporary topics relevant to community health and community health nursing practice at the individual, family, and aggregate levels. Students have the opportunity to explore clinical focused roles of the community health nurse in peer, primary, secondary, and tertiary prevention of health problems in individuals, families, and aging families throughout pregnancy, birth, and child-rearing. Prereq: NURS 656C. 2 cr.

799. Honors Senior Thesis
Honor/thesis students conduct an independent research project, relevant to the student's area of specialization in the major, under the direction of a faculty sponsor. The student prepares a research proposal, write a final report, and provide an oral presentation. Two semester sequence; IA (continuous grading) grade given at the end of first semester. Restricted to Senior/Natural Resource Majors. Permission. Writing intensive. 4 cr.
Nursing, Nutritional Sciences

656C. Community Health Nursing II/ Clinical

Experience in various clinical settings to provide opportunities for the development of the community health nursing role. Students collaborate with multidisciplinary health professionals in planning, providing, and evaluating health services to population at risk. Prereq: open to RN students only by permission. Coreq: NURS 656. 1 cr.

694. Special Topics

Specialized courses covering information not normally presented in regular course offerings. Description of topics will vary. May be repeated but not duplicate areas of content. Prereq: permission. (Not offered every year.) 1 to 4 cr. 794W is writing intensive.

695. Independent Study

In-depth study with faculty supervision. Prereq: junior standing and approval of adviser and faculty of the area concerned. May be repeated for different topics. 2 to 4 cr.

703/703W. Nursing Leadership/ Management and the Organizational Context

Focuses on understanding ways in which the nurse can affect the organizations in which practice occurs and ways in which the organizations affect the individual's practice. Emphasizes issues of leadership; management; power; change; motivation; and interfacing of autonomous, dependent, and interdependent nursing functions in current and future health care delivery systems. Prereq: first-semester senior nursing majors; NURS 622. RN students should take NURS 703W. Special fee. 4 cr. 703W is writing intensive.

710. Families in Health and Illness

Seminar focuses on the family environment as a context for the experience of health and illness. Current middle-range theories and research from nursing and other disciplines analyzed for their application to family health. Public policy initiatives related to family health explored. 4 cr.

719. Professional Nursing Practice: Transitions

Provides opportunity for students to refine and integrate previously learned knowledge and skills into professional practice through a cooperatively designed learning experience/environment. Open to R.N. students only, by permission. Prereq: NURS 606, 655, 656, 656C. 7 cr.

720. Clinical Decision-Making III

Provides the student with the opportunity to integrate prior learning and experience, reflect on individual practice, and transition to professional practice in a career as a Registered Nurse. Emphasizes the refinement of professional skills related to leadership, management, problem solving, clinical and ethical decision-making, critical thinking, interpersonal communication, information management, and working as a productive team member. The weekly seminar provides an opportunity for the analysis, synthesis, refinement, and integration of nursing knowledge and practice. Regularly scheduled standardized tests are used to assess student progress and to provide timely feedback to facilitate the student’s transition to professional practice. Special fee. Prereq: all nursing major courses. Coreq: NURS 720C. 6 cr.

720C. Clinical Decision-Making III Clinical

Refine and integrate previously learned knowledge and skills into professional practice through a cooperatively designed learning experience/environment. Coreq: NURS 720. 6 cr.

794/794W. Special Topics

Specialized courses covering information not normally presented in regular course offerings. Description of topics varies. May be repeated but not in duplicate areas of content. Prereq: permission. Special fee on some sections. 1 to 4 cr. 794W is writing intensive.

797. Honors Thesis

Honor seminar designed to expand the knowledge and skills presented in previous honors in major courses. Focuses on a project relevant to the discipline of nursing under the direction of a faculty adviser. Open to honors-in-major and senior nursing majors. Students must complete two semesters of work 1 cr. in fall, and 4 cr. in spring. Writing intensive. 1 to 4 cr.

Nutritional Sciences (NUTR)

794W is writing intensive.

400/400H. Nutrition in Health and Well Being

This course is designed to teach the scientific principles of human biology using nutritional concepts to promote personal health and well being. Special fee. Students cannot earn credit for this course if they have taken ANSC 400 or NUTR 475. 4 cr.

401. Introduction to the Dietetics Profession

Survey of the role and responsibilities of the dietician. Legal and ethical considerations necessary for the student dietitian in clinical experiences. Educational and personal qualifications for specialization in dietetics. Prereq: NUTR major. Cr/F. (Fall semester only.) 1 cr.

405. Food and Society

Consideration of the cultural significance of food emphasizing historical, psychological, social, political, and economic aspects. Also offered as ANSC 405. (Spring semester only.) Writing intensive. 4 cr.

476. Nutritional Assessment

Designed for the student who plans to enter the health care profession. Introduces the concepts of nutritional assessment and the practical application of these concepts in the nutritional care of clients in clinical, community, and research settings. Prereq: NUTR 400. Special fee. 4 cr.

503. Principles of Food Service Management

Practical experience in methods of purchasing and handling food, tools, and equipment used in quantity food preparation, lab experience in selective settings. May be taken independently of NUTR 504. Prereq: HMG 403 or permission of instructor. (Fall semester only.) 3 cr.

504. Managerial Skills in Dietetics

Emphasizes the basic principles of managing clinical, community, and food service operations, including personnel management, in-service and on-the-job training, policies and procedures development, and financial management. (Spring semester only.) 3 cr.

510. Nutrition Education and Counseling

Principles, methods, skills and materials involved in nutrition education and counseling. Emphasizes development of educational materials and practicum skills necessary to perform as an effective nutrition counselor. (Fall semester only) Prereq: Nutrition major or permission. 4 cr.

546. Nutrition in Exercise and Fitness

An in-depth look at the facts and fallacies behind eating for optimal health and physical performance. Topics include gaining and losing weight, nutritional supplements for optimal performance, disordered eating, protein supplementation, and proper training diets. Prereq: NUTR 400 or equivalent. 4 cr.

550. Food Science: Principle and Practice

Principles of food composition structure and properties and the chemical changes foods undergo in preparation and processing. Study of the laws and regulations that are applied to marketing food systems; principle and practice in food preservation. Application of scientific principles and interpretations of laboratory findings. Prereq: HMGT 403, NUTR 400, CHEM 403-404, and CHEM 545-546. Special fee. Lab. (Spring semester only.) 4 cr.

595. Mediterranean Diet and Culture

Is there a diet that allows one to eat, drink, and still be healthy? While Americans struggle with rising rates of obesity and related health conditions, inhabitants of the Mediterranean region enjoy relatively low rates of heart disease, cancer, and obesity. Offers a unique on-site experience in Ascoli Piceno, Italy to investigate the cultural and scientific importance of the Mediterranean Diet. Students review basic nutrition concepts as well as the history and evolution of the Mediterranean diet. Combining lecture, discussion, and experiential activities, NUTR 595 is offered through the UNH Italy Study Abroad Program during the summer session. 4 cr.

600/600W. Field Experience in Nutrition

Supervised field experience in public and private agencies with planned learning objectives related to the areas of clinical and community nutrition and food service management. Students are responsible for their own transportation; faculty member coordinates arrangements with fieldwork sites. Prereq: NUTR majors and minors only; permission; NUTR 400. May be repeated for a maximum of 6 credits. Cr/F. 1 to 4 cr. 600W is writing intensive.

650. Life Cycle Nutrition

Comprehensive review of the nutritional issues related to the life cycle. The nutrient requirements of each stage of the life cycle are analyzed in the context of their metabolic functions. The course also involves the practical application of theory at each stage of the life cycle through projects and discussion. Prereq: NUTR 400. (Spring semester only.) 4 cr.

680. Practicum in Weight Management

Provides exposure to the knowledge and practical experience for conducting a weight management program. Includes fundamentals of diet analysis, clinical assessment, fitness testing, testing interpretation of an exercise prescription and dietary management. Students gain experience for conducting a weight management program. Prereq: NUTR 400, 476, 510 and permission. 2 cr.

699/699W. Independent Study

Scholarly research project or supervised teaching experience in an area of the nutritional sciences under the guidance of a faculty adviser. May be repeated. Prereq: permission. Cr/F. 1 to 4 cr. 699W is writing intensive.

709. Nutritional Epidemiology

Introduces the principles and applications of nutritional epidemiology. The major methods of nutritional assessment are reviewed in relation to nutrition.
711. Lipid Metabolism
Structure, metabolism, and function of lipids and their impact on health and disease. Prereq: NUTR 400 and a biochemistry course. 4 cr.

720. Community Nutrition
Solutions to the complex public health nutrition problems require cost-effective, community-based interventions that identify and address their multiple causes. From food insecurity to the challenges of escalating obesity rates, the community nutritionist is a key player in designing prevention, intervention and health promotion programs and policies. Provides the skills and tools needed to assess, implement, and evaluate community nutrition interventions. Prereq: NUTR 400. Writing intensive. 4 cr.

725. Metabolic Adaptations to Exercise II
Examines the regulation of cellular metabolism in muscle, liver, adipose and other tissues of the body by enzymes, effectors, and hormones in response to exercise. Focuses on the exercise-induced mechanisms for controlling metabolic pathways, flow, techniques for studying metabolism, and up-to-date molecular and cellular exercise physiology research. Prereq: BCHM 658 or KIN 724. 4 cr.

740. Nutrition for Children with Special Needs
Nutritional assessment and care of children with special needs resulting in feeding difficulties requiring medical nutrition therapy. Prereq: NUTR 400. 2 cr.

750. Nutritional Biochemistry
Detailed analysis of the digestion, absorption, transport, and intermediary metabolism of nutrients. Nutrient requirements are evaluated in the context of their physiological and biochemical functions. Prereq: ANSC 511-512; BCHM 658; or equivalents. (Also offered as ANSC 750.) Writing intensive. 4 cr.

756. Treatment of Adult Obesity
Overview of the risk factors associated with obesity; evidence-based recommendations for assessment and treatment of obesity. Counseling skills important to successful weight management and non-diet approaches are also explored. 2 cr.

#760. Geriatric Nutrition
Emphasis on the nutritional requirements and status of the elderly in view of psychological and physiological changes in aging. Approaches for nutrition intervention and support will be addressed. Prereq: NUTR 400 or permission. (Also offered as ANSC 760.) Summer semester only. 3 cr.

770. Nutrition and Gender Based Health Concerns
Offers a comprehensive review of the health issues facing adult men and women today. Students read and evaluate the current literature and document their reactions to group discussion in reaction papers on the topic. Students also present a topic of interest to the class. 2 cr.

773. Clinical Nutrition
Application of principles of normal nutrition and physiology to clinical problems; altered nutrient requirements in human disease. Prereq: basic nutrition, anatomy and physiology, and biochemistry, or permission. Coreq: NUTR 775. (Fall semester only.) 4 cr.

775. Practical Applications in Medical Nutrition Therapy
Supervised practical experience in therapeutic dietetic in one of several cooperating New Hampshire hospitals. Emphasizes nutritional counseling, assessment, and instruction of patients with nutrition-related disorders. Prereq: basic nutrition, anatomy, and physiology, and biochemistry. Coreq: NUTR 773. (Fall semester only.) 3 cr.

780. Critical Issues in Nutrition
Critical review and analysis of controversial topics in nutrition: emphasis on developing oral and written communication skills and analytical reasoning skills. Prereq: permission. (Spring semester only.) Writing intensive. 4 cr.

795/795W. Investigations
Prereq: permission. 1 to 4 cr. 795W is writing intensive.

799. Honors Senior Thesis
A special project conducted under faculty supervision and resulting in a written honors thesis. Students must initiate discussion of the project with an appropriate faculty member. Offered both semesters. Prereq: Junior or Senior major with cumulative GPA of 3.20; permission. Writing intensive. 1 to 4 cr.

800. Behavior and Development of Children
Introduces to the biological, psychosocial, and cultural aspects of human development from birth through adolescence. Emphasizes theories that help explain human behavior; discusses implications of developmental research. 4 cr.

501. Developmental Tasks of Adulthood
Includes the biological and psychosocial context of development. Developmental tasks as they relate to the accomplishment of prior tasks, physiological change, socioeconomic status, and psychosocial development. Prereq: child development course or permission. 4 cr.

510. Exploring Occupational Therapy and Occupation
Occupational therapy is introduced as a human service profession through experiential and academic activities, which illustrate the personal and professional skills required to practice in a variety of settings and roles. Basic concepts of human occupation and the therapeutic use of occupation are explored. Comparisons are made to related human service careers. Students are encouraged to do a personal assessment of their interest and potential for further study of occupational therapy. Students are required to complete a community service learning assignment 4 cr.

513. Stressed Out: The Science and Nature of Human Stress
The human stress response system, research investigating the sequelae of stress on health, protective strategies for stress, managing personal stress effectively, and strategizing stress modulation as an intervention technique. Course format includes two hours of weekly lecture/discussion followed by one hour of experiential laboratory in which students research and/or apply new information. Special fee. 4 cr.

595. Special Topics
Explores areas related to occupational therapy theory, practice, and/or research. Special fee on topic: College as Transition. 4 cr.

685. Psychosocial Disorders and Everyday Life
The study of abnormal behavior in the context of its effect on everyday function. Provides background information on adult psychosocial disorders commonly seen by service providers in the mental health system. Students learn to observe and describe behavior in terms of functional impairment, diagnostic criteria, and causative factors. General psychosocial and biological treatments are studied. This course or its equivalent is a prerequisite for entry to the professional masters degree program in occupational therapy. Students are expected to begin this course a basic knowledge of basic psychological aspects of human development. Prereq: PSYC 401. 4 cr.

695. Independent Study
In-depth study with faculty supervision. Prereq: junior standing in OT major; approval of major adviser and faculty of area concerned. May be repeated for a maximum of 8 credits. 2 to 4 cr.

722. Introduction to Assistive Technology
Hands on course provides participants with an overview of the application of assistive technology in all life settings for individuals affected by physical, sensory, or cognitive limitations. Methods, materials, and resources for obtaining and providing assistive technology services will also be discussed. Special fee. 4 cr.

724. Assistive Technology and Physical Disabilities
An advanced course that focuses on the specialized assistive technology needs of persons with physical impairments. Topics include seating and positioning needs, prosthetic devices, manual powered mobility devices, ergonomics and computer access. Special fee. 4 cr.

726. Assistive Technology and Sensory, Communicative, and Cognitive Disabilities
Explores the application of various technologies for individuals with visual, auditory, cognitive and communication impairments. Included are: blind and low vision aids, assistive listening devices, alternative and augmentative communication devices, memory aids, and prompting aids. Special fee. 4 cr.

741. Human Occupation
Students have three hours of classroom contact and regular contact with a mentor who is a master of a particular occupational activity. Students learn the activity with support of the mentor and other relevant experiences. Assignments include a presentation and two papers. An honors in the major course. Writing intensive. Special fee. 4 cr.

746. Transitions: Student to Professional
This course is designed to help occupational therapy students explore role changes involved in leaving the academic world and entering the larger realm of professional and practice settings. Research on professional development indicates this transition is easier when students are prepared in both personal and institutional domains. Through lecture, presentations, small group work, readings, and written assignments students are given opportunities to analyze factors that contribute to successful professional development and ethical practice. Students use the results of their analyses to plan their individual transitions to fieldwork and entry-level practice. Prereq: OT 792; second semester senior. 2 cr.
751. Mind Body Systems/Neurologically Based Dysfunction and Dysfunction
Students study neurologically related disorders commonly seen by occupational therapists. A problem-based learning method is used to examine the perceptual, cognitive, biopsychosocial basis of these disorders. A basic overview of human bodymind systems is provided with an emphasis on pathology, the recognition of symptoms, their causes and the occupational implications of the disorders. Selected theoretical frames of reference for assessment and intervention are discussed in terms of general, holistic methods of practice. The course is a prerequisite for courses in specific occupational therapy assessment and intervention. 4 cr.

752. Human Movement and Environmental Effects on Everyday Occupations
Integrates the student’s prerequisite knowledge of occupation. Develops skills required for interpretation of biomechanical analysis for creating successful occupational performance for individuals with varied musculoskeletal, cardiac and respiratory dysfunction. Integration of the occupational therapy clinical reasoning process and the use of occupations as a therapeutic mechanism for change are emphasized. The analysis of environment as it relates to human movement and participation in desired occupations is explored. Special fee. 4 cr.

762. Evaluation Principles and Methods
Introduce students to the OT evaluation process. Students apply the clinical reasoning process to OT evaluation across age levels, and types of medical conditions. Students learn about common assessment tools available to occupational therapists, where, when, and how to apply them, and how to evaluate assessment tools. Students develop technical skills in administering selected evaluation tools, in integrating assessment data, and demonstrate emergent clinical decisions about intervention planning. Finally, they gain an appreciation of the importance of measurement in various facets of OT practice. Coreq: OT 763. Special fee. 4 cr.

763. Occupational Therapy Intervention
Expands upon the knowledge gained and skills developed in Evaluation Principles and Methods. Students further develop skills in selecting evaluation tools and demonstrating coherent clinical decisions about intervention planning based on data gathered. Selected classes are used for adaptation of knowledge; the course emphasizes the application and demonstration of common intervention strategies used by occupational therapists. Coreq: OT 762. Special fee. 4 cr.

764. Occupational Therapy Intervention Lab
Occupational Therapy Intervention Lab is a corequisite course to accompany OT 763/863 Occupational Therapy Intervention, a lecture course. The lab course provides opportunities for students to engage in experiential learning and application of principles and techniques learned in the lecture course. The lab sections are small and enable students to receive feedback on their performance during in-class learning activities and written work. 3 hours of contact per week. Special fee. 2 cr.

771. Enabling Participation in Community Groups
Students will work in an organization, learn about the people served by this organization, conduct an assessment for occupation-based program or wellness program needs within the organization, and develop a proposal for this program to be implemented during the semester. Special fee. 4 cr.

772. Occupation, Health, and Community Programming
Part of the two-course community programming sequence. Explores the concepts of health and wellness applied to population-based occupational therapy. Students implement community-based interventions to meet identified public health needs. Special fee. Writing intensive. 4 cr.

791. Senior Honors Thesis
Completion of a research proposal based on a topic of relevance to the occupational therapy profession. Development of knowledge and skills in receiving and critiquing research and professional literature; research design and methodology; and the development of a research proposal. Required for graduation with honors in the major. Prereq: Completion of OT 741. 4 cr.

792. Level I Fieldwork
Provides occupational therapy students an opportunity to experience occupational therapy in a clinical setting. Students attend a seminar prior to beginning their placement. The Level I placement is scheduled between the fall and spring semesters of the senior year. During fieldwork, students observe an occupational therapist as well as participate in the planning and implementing of the occupational therapy assessment or intervention process for a client. Cr/F. 1 cr.

795. Special Topics
Explores areas related to occupational therapy theory, practice, and/or research. May repeat to 12 credits but not in duplicate subject areas. Prereq: permission. Special fee on some sections. Cr/F. 2 to 4 cr.

Ocean Engineering (OE)

(For program description, see page 112.)

690. Introduction to Ocean Engineering
Survey of engineering applications in the ocean environment. Topics may include hydrodynamics, waves, tides, underwater sound, instrumentation and wave structure interaction. Introduction to ocean testing. Prereq: ME 407 or equivalent. Special fee on some sections. Cr/F. 3 er.

700. Ocean Measurements Lab
Measurements of fundamental ocean processes and instruments. Laboratory work combines theoretical and practical aspects of ocean measurement, and associated instrumentation. Taught by a team of faculty members from engineering departments. Prereq: PHYS 408; MATH 527; ECE 544 or permission. Lab. 4 er.

724. Environmental Acoustics: Air and Water
Sound and vibration; simple harmonic oscillators; characteristics and measurements of sound sources and receivers; acoustic wave equation (1D, 2D, 3D); sound reflection, transmission, refraction, and absorption in various media; room acoustics; basic sonar equation. Prereq: PHYS 408; MATH 527; ECE 544 or permission. Lab. 4 cr.

754. Ocean Waves and Tides
Introduces waves: small amplitude, linear wave theory, standing and propagating waves, transformation in shallow water, energy and forces on structures, generation by wind and specification of a random sea, long waves with rotation, and internal waves. Introduces tides: description of tides in ocean tidal generation forces, equilibrium tide, and tidal analysis. Lab/project: field and lab measurements with computer analysis. Prereq: PHYS 407-408; MATH 527/or permission. Lab. 4 cr.

756. Principles of Naval Architecture and Model Testing
Fundamentals of naval architecture presented, including hydrostatics, basics of resistance and propulsion, sea keeping and scaling. Concepts applied in experiments utilizing the tow/wave tank and associated instrumentation. Prereq: ME 608 or equivalent; ME 627 or equivalent. 4 cr.

757. Coastal Engineering and Processes
Introduces small amplitude and finite amplitude wave theories. Wave forecasting by significant wave method and wave spectrum method. Coastal processes and shoreline protection. Wave forces and wave structure interaction. Introduction to mathematical and physical modeling. (Also offered as CIE 757; ME 757.) Prereq: fluid dynamics or permission. 3 cr.

770. Fundamentals of Ocean Mapping
Introduces the principles and practice of hydrography and ocean mapping. Methods for the measurement and definition of the configuration of the bottoms and adjacent land areas of the oceans, lakes, rivers, estuaries, harbors and other water areas, and tides or water levels and currents that occur in those bodies of water. Prereq: PHYS 407-408. (Also listed as ESCI 770.) Lab. 4 cr.

771. Geodesy and Positioning for Ocean Mapping
The science and technology of acquiring, managing, and displaying geographically-referenced information; the size and shape of the earth, datums and projections; determination of precise positioning of points on the earth and the sea, including classical terrestrial-based methods and satellite-based methods; shoreline mapping, nautical charting and electronic charts. Prereq: MATH 426, PHYS 408. (Also listed as ESCI 771.) 3 cr.

785. Environmental Acoustics II: Air and Water
General sonar equation: active, passive, sound generation, source level, directivity, calibration methods; sound propagation, rays and normal modes, acoustic waveguides; transmission loss, reverberation, scattering; ambient noise characteristics and measurements; sound reception and processing. Prereq: ECE 745 or OE 745. Also listed as ECE 784. 4 cr.

785. Special Topics
New or specialized courses and/or independent study. May be repeated for credit. 2 to 4 cr.
Philosophy (PHIL)

(For program description, see page 45.)

401/401H/401W. General Introduction to Philosophy
Depending upon the instructor, emphasizes basic philosophical problems, recurrent types of philosophies, or selected readings from the history of philosophy. 4 cr. 401W is writing intensive.

412/412H. Beginning Logic
Principles of reasoning and development of symbolic techniques for evaluating deductive and inductive arguments. 4 cr.

417. Philosophical Reflections on Religion
Introduces philosophy of religion to help students become critically aware of philosophical issues involved in various forms of religious belief and some of the persisting philosophical understandings of those issues. 4 cr.

421/421H. Philosophy and the Arts
Contemporary philosophic concerns and perspectives as reflected in one or more of the arts (literature, theatre, film, music, plastic art). Writing intensive. 4 cr.

424. Science, Technology, and Society
Consideration of the scientific endeavor and its social import from a philosophical perspective. 4 cr.

430/430H/430W. Society and Morals
Critical study of principles and arguments advanced in discussion of current moral and social issues. Possible topics: violence, rules of warfare, sexual morality, human rights, punishment, abortion. 4 cr. 430W is writing intensive.

435. Human Nature and Evolution
Philosophy of biology and the evolutionary process. Readings of scientists and philosophers' commentary on scientists. Examination of the differences between scientific debate and philosophic debate. Philosophical study of scientific theory stressing humans' place in the natural world and the ethical implication of humans as natural beings in the evolutionary process. 4 cr.

436. Social and Political Philosophy
Examines social and political thought that may include texts from ancient through contemporary times, addressing topics such as natural rights, revolution, law, freedom, justice, power. Questions may include: What is a community, and how are individuals related to communities? Can any particular form of government be morally justified, and if so, what kind of government? Can anarchism work? Is there something wrong with a society in which there is private ownership of property? What is oppressive? What is freedom, and are we free? What rules should different forms of power play in a society? Could and should there be a genderless society? Is ethnic diversity valuable? Writing intensive. 4 cr.

444A. Concepts of Self
An inquiry into the nature of the self and into the conditions under which it may best flourish. Is the self fundamentally biological, spiritual, or social? Draws on a variety of perspectives in an attempt to answer these questions, including East Asian as well as Western philosophical ideas, feminist theory, Existentialism, and others. Writing intensive. 4 cr.

447/447H. Computer Power and Human Reason
The historical origins of the science of computation. The implications of the nature of information-processing for understanding the mind-body relation. Examines the possible social, economic, and educational consequences of the computer revolution. 4 cr.

450/450H. Ecology and Values
Focuses on historical and contemporary philosophies of nature and their effects on human interaction with the environment. Issues include obligations to future generations and to animals, plants, and ecosystems; moral limits on consumption and reproduction; and the existence of objects of intrinsic value. Specific topics may include species loss and biological diversity, population growth, changes in the atmosphere, energy use, and sustainable development. 4 cr.

495. Tutorial Reading
Basic introductory reading under faculty direction on topics of philosophical importance. Books offered for tutorial reading may be in any area the instructor chooses or on independent study basis. Prereq: permission. 1 to 4 cr.

496. Topics
Introductory-level seminar in specific topics or problems considered from a philosophic point of view. 4 cr.

500. Workshop
Introduces methods of studying philosophical texts. Emphasizes reading philosophical texts and arguments for comprehension, and on writing philosophically with accuracy and clarity. Open to PHIL majors only (PHIL minors may enroll if they receive permission). Writing intensive. 4 cr.

510. Philosophy and Feminism
Focuses on the philosophical issues in feminism primarily through the work of historical and contemporary philosophers. Topics include the question of the nature of women, feminism as an ethical and political theory, feminism as an exploration and transformation of the self, feminism as a philosophical methodology, the institutions of marriage and motherhood. Writing intensive. 4 cr.

520. Introduction to Eastern Philosophy
Major Eastern traditions of philosophy. Concentration on Indian, Chinese, and Japanese systems may vary from semester to semester. 4 cr.

525/525H. Existentialism
Readings from Western philosophy and literature. Selections may be drawn from the works of Kierkegaard, Nietzsche, Heidegger, Sartre, Camus, de Beauvoir, Buber, Bultman, Merleau-Ponty, Tillich, Kafka, and others. 4 cr.

530. Moral Philosophy
Critical examination of the development of philosophical thinking regarding human values, rights, and duties. 4 cr.

540. Philosophy of Race and Racism
Investigates the concept of race and how different understandings of race underlie racist and anti-racist political policies; explores how racism is interlocked with gender, economic, and other forms of oppression. Questions may include: What is racism? Do racial categories (such as black, white, Latino) have any scientific basis, or are they socially constructed? If race is socially constructed, is it still "real" and should it be treated as such? Should public policies be "color-blind" with respect to race? Is whiteness a problematic racial identity and what can white people do about it? How is racism built into the structure of the state? Can popular racial discourse serve to support racist policies or attitudes even when it does not contain explicitly racist claims? 4 cr.

550. Symbolic Logic
Principles and techniques of modern logic. Topics: propositional logic, truth tables, predicate logic, and, and, time permitting, basic meta-theorems. Prereq: PHIL 412. 4 cr.

560. Philosophy Through Literature
Philosophical implications of representative literary works, read in tandem with philosophical works or articles. The content will vary. The literary works explored may be drawn from ancient times through modern times. For examples, the classic novel associated to "Ayn Rand" might be explored for its implications regarding moral, political, and feminist philosophy, or the philosophical implications of an anti-utopian contemporary work like "Brave New World" might be explored, or short stories drawn from science fiction and other speculative fiction might be used to explore the possibility of time travel or of machines with mental lives. Writing intensive. 4 cr.

570/570H. Ancient Philosophy
Development of Western philosophy from its beginnings in Greece to the Roman period, with particular emphasis on the thought of Plato and Aristotle. 4 cr.

571. Medieval Philosophy
Philosophical thought from the Middle Ages from inception in the late Roman period with thinkers such as Plotinus and Augustine through the late medieval speculative mysticism of such figures as Meister Eckhart. Writings of Augustine and Thomas Aquinas. 4 cr.

580. Modern Philosophy from Descartes to Kant
The birth and development of distinctively modern philosophy in the thought of such creative minds as Galileo, Descartes, Hobbes, Leibniz, Spinoza, Locke, Berkeley, Hume, Rousseau, Reid, Kant, and others. Prereq: PHIL 570 or permission. 4 cr.

610. Advanced Topics in History of Philosophy
In-depth examination of a major figure or philosophical movement in the history of philosophy. Content will vary. Consult the Time and Room Schedule for topics. Course may be taken twice for credit (a third time with permission of the undergraduate program director) so long as the topic is different. May not be repeated to improve grade without approval from director of philosophy undergraduate program. Prereq: PHIL 574 or 575/or permission. Writing intensive. 4 cr.

616. 19th Century Philosophy
Philosophical movements or philosophers associated with philosophical movements, such as later German idealism, French positivism, utilitarianism, Marxism, existentialism, and vitalism. Content will vary. Consult the Time and Room Schedule for topics. Course may be taken twice for credit (a third time with permission of the undergraduate program director) so long as the topic is different. May not be repeated to improve grade without approval from director of philosophy undergraduate program. Prereq: PHIL 574 or 575/or permission. Writing intensive. 4 cr.
618. 20th Century Anglo-American Philosophy

Major figures in the analytic tradition in England and America. Content will vary. Consult the Time and Room Schedule for topics. Course may be taken twice for credit (a third time with permission of the undergraduate program director) so long as the topic is different. May not be repeated to improve grade without approval from director of philosophy undergraduate program. Prereq: two courses in history of philosophy (one of which may be concurrent)/or permission. Writing intensive. 4 cr.

620. 20th Century European Philosophy

Major figures or philosophical movements such as phenomenology, existentialism, critical social theory, and post-modernism. Content will vary. Consult Time and Room Schedule for topics. Course may be taken twice for credit (a third time with permission of the undergraduate program director) so long as the topic is different. May not be repeated to improve grade without approval from director of philosophy undergraduate program. Prereq: two courses in history of philosophy (one of which may be concurrent)/or permission. Writing intensive. 4 cr.

631. Topics in the Philosophy of Science

Philosophical problems raised by the physical, biological, and social sciences. Content will vary. Topics may include the nature of scientific explanation, the role of mathematics in science, the relations of science to common sense, the relation of theory to observation, the nature of historical changes in scientific world view, claim to objectivity in the natural and social sciences, the role of values in scientific research, the relation of the logic of science to the philosophy and history of science. Prereq: two courses in history of philosophy/or permission. Writing intensive. 4 cr.

635. Philosophy of Law

Systematic study of salient features of legal systems. Possible topics: nature of law; concept of legal validity; law and morality; individual liberty and the law; legal punishment; legal responsibility and related concepts (for example, legal cause, harm, mens rea, negligence, strict liability, legal insanity). Writing intensive. 4 cr.

660. Law, Medicine, and Morals

Critical examination of the diverse legal and moral issues facing the profession of health care. Variable topics. Possible topics: duty to provide care; nature of informed consent to treatment; problems of allocating limited health-care resources (e.g., withdrawal of life-support systems, quality-of-life decisions, etc.); patient's right to confidentiality. Problems relating to involuntary preventive care (e.g., involuntary sterilization, psycho-surgery, etc.). Writing intensive. 4 cr.

701. Topics in Value Theory

Philosophical inquiry into the nature of value. Topics may include the grounds of right and wrong, various conceptions of morality, the nature of good and evil, theories about the meaning of life, the nature of the beautiful. Content will vary. Consult the Time and Room Schedule for topics. Course may be taken twice for credit (a third time with permission of the undergraduate program director) so long as the topic is different. May not be repeated to improve grade without approval from director of philosophy undergraduate program. Prereq: permission. Writing intensive. 4 cr.

702. Topics in Metaphysics and Epistemology

Advanced study in one or more of the following topics: nature of reality, relationship of thought and reality, nature of knowledge and perception, theories of truth. Content will vary. Consult the Time and Room Schedule for topics. Course may be taken twice for credit (a third time with permission of the undergraduate program director) so long as the topic is different. May not be repeated to improve grade without approval from director of philosophy undergraduate program. Prereq: two courses in history of philosophy/or permission. Writing intensive. 4 cr.

720. Philosophical Psychology

Philosophical perspectives and problems concerning human nature or the human condition; e.g., the nature of "self," human action, the body-mind problem, freedom of the will, the meaning of "person," the nature of behavior, etc. Prereq: PHIL 500 and either PHIL 570 or PHIL 580; or permission. Writing intensive. 4 cr.

730. Theories of Justice

The idea of justice is central to social, political, and legal theory. Considerations of justice are appealed to in assessing the legitimacy of governments, and the fair distributions of goods, and opportunities both with nation-states and globally, and to address specific social concerns such as radical or gender discrimination or access to health care. Examine both historical sources and contemporary debates about the nature of justice. Prereq: PHIL 500, 530, or permission. 4 cr.

740. Advanced Topics in the Philosophy of Law

Content variable. In-depth examination of special topics (constitutional law, crime and punishment, international human rights and gender, sexual orientation, race and class in the law) or a major figure in the philosophy of law (Dworkin, Habermas and Rawls). Prereq: PHIL 635 or permission. Writing intensive. 4 cr.

755. Environmental Philosophy and Policy

Explores philosophical and moral issues, principles, and perspectives involved in human behavior toward, and treatment of, the natural environment and their implications for environmental policy. Various historical and contemporary ethical perspectives compared and evaluated, e.g., utilitarianism, natural law tradition, deep ecology, anthropocentrism, eco-feminism, as well as other social and religious approaches. Prereq: one course on environmental issues (PHIL 450 or NR 435) or permission. Writing intensive. 4 cr.

780. Special Topics

Advanced study of special topics: a problem, figure, or movement in the history of philosophy; or select issues, thinkers, or developments in contemporary philosophy. Prereq: PHIL 500 and one course in the history of philosophy; or permission. Writing intensive. 4 cr.

795. Independent Study

For students who are adequately prepared to do independent, advanced philosophical work; extensive reading and writing. Before registering, students must formulate a project and secure the consent of a department member who will supervise the work. Conferences and/or written work as required by the supervisor. May be repeated to a total of 8 credits. Writing intensive. 1 to 8 cr.

798, 799. Senior Thesis

Two-course sequence open only to senior philosophy majors in the University Honors Program, the philosophy department honors-in-major program, or by special permission from the department. All senior thesis candidates must have a proposal approved in the spring of their junior year and a thesis adviser assigned by the undergraduate program director before registering for 798. Students must orally defend their theses before the department. (See department guidelines for further details.) Prerequisite for 798: PHIL 500. Prerequisite for 799: B- or above in 798. Writing intensive. 4 cr.

Physics (PHYS)

(For program description, see page 69.)

400. Freshman Seminar

An informal reading and discussion course to introduce students to the general culture of physics, including career possibilities, historical and philosophical aspects of physics, current research at UNH and elsewhere, and physics in the news. Topics vary based on interests of the class. Students in their first year as physics majors (either as freshmen or transfers) are strongly encouraged to take this class. Cr/F. 1 cr.

401. Introduction to Physics I

Broad survey of classical and modern physics. Designed to enable students to appreciate the role of physics in today's society and technology. Emphasizes the fundamental laws of nature on which all science is based, with some examples of interest to biologists. Knowledge of high school algebra, geometry, and trigonometry essential. Special fee. Lab. 4 cr.

402. Introduction to Physics II

Broad survey of classical and modern physics. Designed to enable students to appreciate the role of physics in today's society and technology. Emphasizes the fundamental laws of nature on which all science is based, with some examples of interest to biologists. Knowledge of high school algebra, geometry, and trigonometry essential. Prereq: PHYS 401 or the equivalent. Special fee. Lab. 4 cr.

404. Introduction to Space Science

Students are exposed to the theoretical, analytical, and practical aspects of research in the modern astrophysics, solar, planetary, and space plasma physics. Basic principles of physics are tied to research projects that students pursue working in small groups, using complex engineering and numerical simulation models, and becoming members of actual research teams. Cr/F. 4 cr.

406. Introduction to Modern Astronomy

Descriptive coverage of contemporary astronomical and astrophysical techniques with a review of current knowledge and theories concerning the solar system, galaxies, and the universe. Recommended for liberal arts and beginning science students. Knowledge of high school algebra is assumed. Special fee. Lab. 4 cr.

407H. General Physics I

Introductory course emphasizing motion, forces, energy, momentum, rotation, and oscillations. Recommended for the student specializing in science and engineering. Students in the Honors section must be co-enrolled in MATH 425H so that strong connections can be made between math and physics. 407H students work in groups in ev-
MATH 526 or MATH 528. 4 er.

Analytical treatment of classical mechanics covering the dynamics of particles and rigid bodies at an intermediate level. Advanced mathematical analysis (complex numbers, differential equations, Fourier series, multiple integrals) are reviewed or introduced as needed to analyze physical situations. Prereq: PHYS 407. Pre- or Coreq: MATH 527. 4 cr.

408/408H. General Physics II
Introductory course emphasizing waves, sound, heat, electricity and magnetism. Recommended for students specializing in science and engineering. Students in the Honors section must be co-enrolled in MATH 426H so that strong connections can be made between math and physics. 408H students work in groups in every class meeting. Prereq: PHYS 407. May not receive credit for both PHYS 402 and 408. Pre- or Coreq: MATH 426. Special fee. Lab. 4 cr.

409. Introduction to Problem Solving
Introduces problem solving techniques applied to Physics 407 material. Emphasis on using conceptual understanding to guide problem solution, choosing appropriate strategies, and methods of checking solutions. 1 cr. Coreq: PHYS 407

444. Myths and Misconceptions About Nuclear Science
The discoveries of nuclear physics have spawned the nuclear power plant and bomb, but also many far reaching, though less recognized applications of nuclear science in medicine, research, and our everyday lives. This course examines the underlying physics of nuclear science, the resulting technological applications and dangers, and some of the implications for public policy. In the process, we dispel many of the popular myths and misconceptions that surround nuclear science and radiation in the public's mind and the media. You may be surprised to find that topics are wide ranging and inherently interdisciplinary. They include nuclear stability and radioactivity, natural sources of radioactivity, the effects of radiation on living things, particularly people, nuclear medicine, nuclear science in fields such as biology, archeology, geology and engineering, nuclear chain reactions, nuclear reactors and energy, nuclear accidents, radioactive waste, nuclear weapons and proliferation, nuclear energy in stars, and the origin of the elements. Be prepared to actively participate. 4 cr.

444A. The Big Bang
Writing intensive. 4 cr.

505. General Physics III
Electromagnetic waves, geometrical and physical optics, relativity, atomic physics, elementary quantum mechanics, molecular physics, and nuclear physics. Prereq: PHYS 408. 3 cr.

506. General Physics III Laboratory
Structured laboratory experience in optics and modern physics. Coreq: PHYS 505. Special fee. Lab. 1 cr.

508. Thermodynamics and Statistical Mechanics
Classical and statistical approach to thermodynamics, kinetic theory. Prereq: PHYS 505. Coreq: MATH 526 or MATH 528. 4 cr.

605. Experimental Physics I
Circuit design with passive and active elements including transistors and operational amplifiers; electrical measurements for experimental physics; digital electronics, microprocessors, and interfacing with computers. Prereq: PHYS 408, 505; MATH 525 or 527. Lab. 5 cr.

615. Classical Mechanics and Mathematical Physics I
Analytical treatment of classical mechanics covering the dynamics of particles and rigid bodies at an intermediate level. Advanced mathematical analysis (complex numbers, differential equations, Fourier series, multiple integrals) are reviewed or introduced as needed to analyze physical situations. Prereq: PHYS 407. Pre- or Coreq: MATH 527. 4 cr.

616. Classical Mechanics and Mathematical Physics II
Analytical treatment of classical mechanics covering the dynamics of particles and rigid bodies at an intermediate level. Advanced mathematical analysis (complex numbers, differential equations, Fourier series, multiple integrals) are reviewed or introduced as needed to analyze physical situations. Prereq: PHYS 615. 4 cr.

701. Introduction to Quantum Mechanics I
Nonrelativistic Schroedinger equation, the hydrogen atom, applications to atomic and nuclear structure. Prereq: PHYS 505, 615, 616. 4 cr.

702. Introduction to Quantum Mechanics II
See description for PHYS 701. 4 cr.

703. Electricity and Magnetism I
Foundation of electromagnetic theory; electrostatics, dielectric theory, electromagnetism, magnetic properties of matter, alternating currents, Maxwell's field theory. Prereq: PHYS 408, 615, 616. 4 cr.

704. Electricity and Magnetism II
See description for PHYS 703. 4 cr.

705. Experimental Physics II
Modern physics experiments and special project problems assigned to individual students. Prereq: PHYS 605; senior standing in physics. Lab. Writing intensive. 4 cr.

706. Introduction to Physics Research
Introduces research in physics including research currently conducted at UNH, library resources, responsible conduct in research, how research differs from coursework, and how research results are presented in the research community. Cr/F. 1 cr.

708. Optics
Geometrical optics, electromagnetic theory of light, interference, diffraction, polarization, related phenomena and nonlinear optics. Prereq: PHYS 505, 615, 616. Lab. 4 cr.

710. Introduction to Modern Astrophysics
Reviews the sun, stars, Milky Way, external galaxies, and expansion of the universe. Recent discoveries of radio galaxies, quasi-stellar objects, cosmic black-body radiation, x rays, and gamma rays precede a discussion of Newtonian and general relativistic cosmological models, steady-state/big-bang theories, and matter-antimatter models. Prereq: PHYS 505, 615, 616. 4 cr.

712. Introduction to Space Plasma Physics
Introduces space plasma physics, including solar physics, heliospheric physics, magnetospheric physics, and ionospheric physics. An overview of the basic phenomena and processes (e.g., particle acceleration and transport, shock formation, magnetic structures and reconnection, wave propagation, wave-particle interactions, instabilities), theoretical techniques (e.g., single-particle orbits, kinetic and fluid descriptions), and experimental techniques. (Alternate years only.) 4 cr.

718. Introduction to Solid State Physics

720. Nuclear Physics
Nuclear phenomenology, reactions, models, radiation, interaction of radiation with matter; accelerators; properties and interactions of elementary particles; symmetries and symmetry breaking; standard model. Prereq: PHYS 702, 704. 4 cr.

764. General Relativity and Cosmology
Review of special relativity, and the motivation for considering gravity in terms of curvature of spacetime. Introduction to Riemannian geometry, general relativity and Einstein's equations. Application of general relativity in the study of black holes, gravitational waves, cosmology, as well as recent results on inflation and quantum gravity. (Alternate years only.) 4 cr.

791. Special Topics
Any selected topics not covered sufficiently in a general course may be studied. May be repeated to a maximum of 8 credits. 4 cr.

795. Independent Study
Individual project under direction of a faculty advisor. Prereq: department permission. 1 to 8 cr.

799. Thesis
Students work under the direction of a faculty sponsor to plan and carry out independent research resulting in a written thesis. Required for honors-in-major. Restricted to seniors. Prereq: permission. May be repeated to 8 credits. Writing intensive. 4 cr.

Plant Biology (PBIO)
(For program description, see page 97.)

400. Plants and Civilization
Global experience of human interactions with plants and ways in which plants have contributed to the development and flourishing of human societies. Includes role of plants in providing sustenance, clothing and shelter, quest for spices and the historical consequences of plant explorations and exploitations, the power to heal or kill, plants in mythology and spiritual endeavors, plants that alter consciousness, plant diseases and human history, plants as energy for society, and the Green Revolution—global change and feeding the world in the future. Special fee. 4 cr.

401. Plant Biology Orientation
Overview of plant biology research and teaching facilities; introduction to research, extension, and educational functions within the department; career opportunities in plant biology. Required of all plant biology majors. Cr/F. 1 cr.

405. Organic and Sustainable Food Production
Introduces systems involved in organic food production with emphasis on sustainability of our food production. Scientific and biological principles relating to organic food production. Role of organic food production in our local communities. Special fee. 4 cr.

412. Introductory Botany
Plants in their natural environments: their structure, function, growth, reproduction, and evolutionary diversity. Special fee. Lab. 4 cr.

421/421H. Introductory Horticulture
Introduces horticultural practices and principles affecting plant growth and development in garden,
landscape, greenhouse, and farm settings. Special fee. Lab. 4 cr.

501. Basic Biochemistry
Fundamentals of general and plant biochemistry for students in majors not requiring the biology core, e.g., health sciences, agricultural sciences, environmental biology. (Will not substitute for BCHM 658-659, BCHM 751-752.) Not open to first-year students; not offered every year. Prereq: CHEM 403-404 or equivalent. 3 cr.

503. Introduction to Marine Biology
Emphasizes the organization of marine biological communities. Various marine environments—pelagic, bentic, temperate, tropical—and their characteristic communities. Major emphasis on the approaches (e.g., analysis of energy flow and predator-prey interactions) used to analyze marine communities as well as the sampling techniques employed for each approach and the characteristic habitat type. Prereq: BIOL 411-412. Special fee. (Also offered also as ZOOL 503.) 4 cr.

#546. Plants, Soils, and Environment
Plant, soil, and environment relationships under natural and modified conditions with emphasis on soils as the foundation resource for plant production. Principles and practice of organic and conventional culture to sustain and improve soils/crops. Contemporary activities impacting soils as part of ecosystems. Prereq: CHEM 403 or permission. Special fee. Lab. 4 cr.

547. Environmental Horticulture
Effects of environmental factors such as nutrition, light, and temperature on plant growth and development. Hands-on learning of a scientific approach to plant production, with an emphasis on producing high-quality greenhouse plants. Diagnosis of plant problems related to environmental factors. Issues of environmental quality related to intensive horticultural production. Special fee. Writing intensive. 4 cr.

565. Turf Management
Adaptation and management of fine turf grasses for recreational, aesthetic, and functional use. Lab. Special fee. 4 cr.

566. Systematic Botany
Scientific basis of plant taxonomy and the identification and classification of major plant families, native trees, shrubs, and wild flowers. Field trips, plant collection. Prereq: BIOL 412 or PBIO 412. Lab. Special fee. 4 cr.

#572. Plant Propagation
Sexual and asexual propagation of horticultural plants. Prereq: PBIO 412 or equivalent or permission. Lab. Special fee. 4 cr.

600/600W. Field Experience
A supervised experience providing the opportunity to apply academic experience in setting associated with future professional employment and/or related graduate opportunities. Must be approved by a faculty advisor selected by the student. May be repeated to a maximum of 8 credit hours. Prereq: permission. Cr/F. 1 to 4 cr. 600W is writing intensive.

612. Plant Genetics and Reproduction
Introduces plant domestication, Mendelian inheritance, plant reproduction, biochemical basis of inheritance, plant breeding, and biotechnology of crop plants. Prereq: CHEM 403; PBIO 412 or equivalent. Will not satisfy biology core requirement for genetics. 4 cr.

625. Introduction to Marine Botany
Life history, classification, and ecology of micro- and macroscopic marine plants, including phytoplankton, seaweed, and salt marsh plants, and the interactions between humans and marine plant communities. Occasional Saturday morning field trips. Prereq: BIOL 412 or PBIO 412 or permission. Special fee. Lab. 4 cr.

650. Crop Production Technologies
Major technologies and systems for intensive production of warm season vegetable crops, including traditional and alternative tillage and fertilizer practices, irrigation systems, storage systems, and use of various plant culture techniques (mulches, row covers, high tunnels, and greenhouses) to extend the growing season. Prereq: PBIO 421 or equivalent or permission; PBIO 546 and 547 recommended. (Not offered every year.) 3 cr.

651. Plant Pathology
Nature, symptomatology, etiology, epidemiology, and control of important plant diseases. Prereq: PBIO 412, BIOL 411-412, or equivalent. Lab. 4 cr.

652. Culture of Vegetable Crops
Origin, distribution, adaptation and culture of major vegetable crops. Plant responses to abiotic stresses, including drought, salt, high and low temperature, visible and ultra-violet radiation, heavy metals, and air pollutants. Current hypotheses, agricultural and ecological implications are discussed. Prereq: plant physiology/biochemistry or permission. (Offered alternate years.) 3 cr.

679. Landscape Management
Relates the principles of plant growth and development to current theory and practice in the establishment and maintenance of landscape plants. Plant selection, site assessment, planting techniques, cultural practices and diagnosis of problems are addressed with emphasis on environmental sustainability. Prereq: PBIO 547 or permission. Special fee. (Offered every other year.) 3 cr.

689. Greenhouse Crop Management
Production of annuals, herbaceous perennials, and flowering bulbs. Hands-on learning of production aspects including nutrition and irrigation management, and details of specific floricultural crops. Business management for greenhouse and nursery operations is covered, including use of computer spreadsheet tools. Prereq: PBIO 547. Lab. Special fee. (Offered alternate years.) 4 cr.

701. Plant Physiology
Structure-function relationship of plants, internal and external factors regulating plant growth and development, plant hormones, plant metabolism, water relations, and mineral nutrition. Prereq: PBIO 412 or PBIO 412 or BIOL 411-412; CHEM 403-404; PBIO 501 or equivalent. 3 cr.

702. Plant Physiology Laboratory
Analytical techniques for plant physiology, effects of growth regulators on plant growth and development, cell and tissue culture, enzyme kinetics, and plant water relations. Pre- or Coreq: PBIO 701. Special fee. 2 cr.

709. Plant Stress Physiology
Physiological and biochemical mechanisms of plant responses to abiotic stresses, including drought, salt, high and low temperature, visible and ultra-violet radiation, heavy metals, and air pollutants. Current hypotheses, agricultural and ecological implications are discussed. Prereq: plant physiology/biochemistry or permission. (Offered alternate years.) 3 cr.

713. Biochemistry of Photosynthesis
Physiology and biochemistry of photosynthesis in higher plants and microorganisms: light reactions, electron transport, membrane structure and function, carbon assimilation pathways, energy conservation, and metabolic regulation. Agronomic and ecological aspects of photosynthesis are examined. Prereq: plant physiology/biochemistry (Not offered every year.) 4 cr.

714. Electron Microscopy
Theory and principles involved in preparing plant and animal tissue for observation with the transmission (TEM) and scanning (SEM) electron microscopes; shadow casting; photographic techniques; stereology; and presentation of micrographs for publication. Prereq: permission. 2 cr.

715. Electron Microscopy Lab
Practical application of theoretical principles and practices used in preparing and observing plant and animal tissues with the transmission and electron microscopes. Student project assigned. Prereq: permission. Coreq: PBIO 714. Special fee. 3 cr.

717. Biology of Lakes
Introduces the ecology of freshwater systems with emphasis on lakes. Origins of lakes and the effects of watersheds on lake chemistry and nutrient cycling are explored. Other topics include the impact of human disturbances on productivity and aquatic food webs and methods used for the management and restoration of lakes. Comparisons are made of the structure and functions of lake ecosystems found in temperate, tropical and arctic regions. Prereq: general biology. (Also offered as ZOOL 717.) 4 cr.

719. Field Studies in Lake Ecology
Ecology of lakes and other freshwater habitats examined through field studies. Emphasizes modern methods for studying lakes; analysis and interpretation of data; and writing of scientific papers. Seminars on research papers and student presentations of class studies. Field trips to a variety of lakes, from the coastal plain to White Mountains; investigate problems, such as eutrophication, acidification, biodiversity and toxins. Capstone experience includes interaction with state agencies, lake stakeholders and the submission of written manuscripts for publication. Prereq: introductory biology. (Also offered as ZOOL 719.) Special fee. Writing intensive. 4 cr.

721. Microscopic Algae
Ecology and diversity of broad array of photosynthetic bacteria and protists, ecological and physiological diversity, anaerobic and aerobic respi-
ration, the evolution of protists, and diversity of marine and freshwater habitats. Use of advanced glass microelectrodes to study metabolic rates. Research project tailored to individual interests. Lab and field trips. Special fee. Prereq: Biology core courses or permission. 4 cr.

722. Marine Physiology
Identification, classification, ecology, and life histories of the major groups of marine algae, particularly the benthonic marine algae of New England. Periodic field trips. Prereq: BIOL 412 or PBIO 412 or 703. Lab. (Offered alternate years.) Special fee. 4 cr.

723. Seaweeds, Plankton, and Seagrass: The Ecology and Systematics of Marine Plants
Introduces the biology of marine plants, with an emphasis on the macroalgae common to the Gulf of Maine and found in abundance at the Isles of Shoals. Lecture topics include productivity in the world's oceans, rocky shore ecology, commercial cultivation of kelp, and phytoplankton ecology, as well as molecular analysis of the evolution and biogeography of marine plants. Field and laboratory exercises include collection and identification of algae from Appledore's intertidal and subtidal habitats, experimental design and data analysis for field study, and tidepool community surveys. Individual field projects may involve studies of algae growth, productivity as it relates to morpho-

logy, photosynthesis, and desiccation during low tide. Daily and evening lectures, laboratories and field work. Prereq: field marine science or one year of introductory biology. (Summers only, at Shoal's Marine Lab.) 4 cr.

725. Marine Ecology
Marine environment and its biota, emphasizing intertidal and estuarine habitats. Includes field, laboratory, and independent research project. Prereq: general ecology, permission. Marine invertebrate zoology, oceanography, and statistics are desirable. (Also offered as ZOOL 725.) Special fee. (Offered alternate years.) 4 cr.

726. Integrated Pest Management
Integration of pest management techniques involving biological, cultural, and chemical control with principles of ecology into management approaches for pests. Prereq: permission. Writing intensive. 4 cr.

727. Algal Physiology
Survey of major topics in the physiology and biochemistry of marine and freshwater algae including: nutrition, metabolic pathways, reproductive physiology, storage and extracellular products, cell inclusions, growth and development. Prereq: plant physiology or introductory biochemistry or permission. (Not offered every year.) 3 cr.

#729. Algal Physiology Laboratory
Useful laboratory techniques in studying the physiology of freshwater and marine algae. Experiments in nutrients, protein metabolism, pigments, and enzyme analysis. Small research project required. Prereq: concurrent registration in PBIO 727; permission. Coreq: PBIO 727. (Not offered every year.) Special fee. 2 cr.

732. Lake Management: A Multidisciplinary Approach
Lectures and seminars on interpreting lake water quality, developing a natural history inventory for lakes, the process of creating a lake management plan, and resolution of conflicting uses of lakes. Students develop lake management plans in cooperation with governmental agencies and lake associations. Guest speakers from state agencies and non-governmental organizations. Introduces use of GIS (Geographic Information Systems) methods for the analysis of lakes and watersheds. Presents lake management issues from scientific and social science points of view. Open to students from all disciplines. (Also offered as ZOOL 732.) Special fee. Lab. 4 cr.

#747. Aquatic Higher Plants
Flowering plants and fern relatives found in and about bodies of water in the northeastern United States; extensive field and herbarium work, preparation techniques, and collections. Prereq: PBIO 566 or permission. Lab. (Not offered every year.) 4 cr.

751. Cell Culture
Theory and principles fundamental to the culture of cells in vitro. Introduces techniques of preparation and maintenance of animal, plant, insect, and fish cell cultures. Application of cell culture to contemporary research in biological sciences. Prereq: MICR 501. Special permission. (Also offered as ANSC 751 and MICR 751L) Special fee. Lab. 5 cr.

752. Mycology
Classification, identification, culturing, life histories, and ecology of fungi, from slime molds to hallucinogenic mushrooms; the significance of fungi in human history, from their contributions to the art of bread making and alcoholic fermentation to their destructive agents as agents of deadly diseases of plants and animals. Prereq: BIOL 411-412 or PBIO 412 or equivalent. Special fee. Lab. 4 cr.

753/753H. Cytogenetics
Chromosome structure, function, and evolution. Eukaryotic genome organization. Theory of, and laboratory techniques for, cytogenetic analysis in plants and animals. Prereq: BIOL 604. Special fee. Lab. (Also offered as GEN 753. Not offered every year.) 4 cr.

754. Laboratory in Biochemistry and Molecular Biology of Nucleic Acids
Application of modern techniques to the analysis of biological molecules, with an emphasis on nucleic acids, includes DNA isolation and analysis, cloning, sequencing, and analysis of gene products. No credit if credit has been received for MICR 704. Prereq: BIOL 604; BCHM 658/659, 751, or permission. (Also offered as BCHM 754, GEN 754.) Special fee. (Not offered every year.) Writing intensive. 5 cr.

758. Plant Anatomy
Anatomy of vascular plants, emphasizing structure and development of basic cell and tissue types, and of the major plant organs. Prereq: BIOL 412 or PBIO 412. Lab. (Not offered every year.) 5 cr.

761. Biodiversity: A Phytogeographic Perspective
Global view of biodiversity, floras and vegetation types, from a phytogeographical perspective. Major factors such as climatic, edaphic, biotic, geologic, glaciation on distributions. Four Saturday field trips: Mt. Washington, northern bogs, old-growth forest, coastal dunes. Prereq: PBIO 566 or permission. (Offered alternate years.) Special fee. Writing intensive. 4 cr.

#766. Plant-Microbe Interactions
Physical, chemical, genetic, and molecular methods utilized by plant pathogens in interactions with plants, as well as plant defense mechanisms. Major groups of plant pathogens (bacteria, fungi and viruses) are discussed, as are beneficial plant-microbe symbioses. (Also offered as MICR 766.) 3 cr.

772. Evolutionary Genetics of Plants
Mechanisms of genetic change in plant evolution, domestication, hybridization, and genetic engineering. Topics include Darwinian theory; speciation and hybridization; origins and co-evolution of nuclear and organelle genomes; gene and genome evolution; transposable elements, chromosome rearrangements, polyploidy. Lab: DNA techniques, sequence analysis programs, phylogenetic trees. Special fee. Prereq: BIOL 604 or equivalent; PBIO 412 or BIOL 411/412 or equivalent. (Also offered as GEN 772.) Writing intensive. 4 cr.

774. Plant Biotechnology and Genetic Engineering
Plant transformation and regeneration, gene isolation and identification, structure and regulation of plant genes, current applications of plant genetic engineering, environmental and social implications. Prereq: BIOL 604 or permission. Not offered every year. (Also offered as GEN 774.) 3 cr.

775. Plant Biotechnology and Genetic Engineering Lab
Techniques for genetic transformation and selection of plants, analysis of foreign gene expression, and plant cell and tissue culture. Coreq: PBIO or GEN 774. (Also offered as GEN 775.) Special fee. (Not offered every year.) 2 cr.

795/795W. Investigations
Topics may include systematic botany, plant physiology, plant pathology, plant anatomy, plant ecology, mycology, cell biology, genetics, biochemistry, molecular biology, cell physiology, scientific writing, micro technique, cell and tissue culture, history of botany, genetics, plant utilization, or teaching experience. Individual projects under faculty guidance. Prereq. permission. (4 credit maximum per semester for any single section.) May be repeated. 1 to 6 cr. 795W is writing intensive.

796/796W. Special Topics

797. Senior Seminar
Professionalism course for plant biology and environmental horticulture majors. Topics focus on the importance of written and oral communications. Projects include resume preparation, oral presentations, and writing activities. Discussion of current topics in horticulture/plant sciences and job search basics. Attendance at selected seminars in related subject areas. Required of all senior majors in environmental horticulture. (Fall semesters only) Cr/F. 1 cr.

799. Honors Senior Thesis
Students work under the direction of a faculty sponsor to plan and carry out independent research resulting in a written thesis. Two-semester sequence; IA grade (continuous course) given at end of first semester. May be repeated to a total of 6 credits. Writing intensive. 2 to 4 cr.
401/401H. Politics and Society
Introduces the nature of politics and political institutions. Emphasizes political behavior and continuing issues of modern politics, such as power, authority, legitimacy, freedom, and order. 4 cr.

402/402H. Introduction to American Government
Power and competition in American politics focusing on voters and elections; public opinion and the media; interest groups and political institutions—the President, Congress, and the Courts. Examines critical political issues from the founding of the nation to the present. 4 cr.

403/403H/403W. United States in World Affairs
Introduction to United States foreign policy since the end of World War II examining the foundations of foreign policy, original and contemporary elements of the Cold War, and the dilemmas of the post Cold War era. Explores contemporary problems facing United States foreign policy such as international economy and transnational global issues. 4 cr. 403W is writing intensive.

407/407H. Law and Society
Introduces the ways in which law operates in modern society: its forms, functions, underlying values, and the consequences of its application in particular regimes. Topics include the psychological bases for legal obligation, the evolution of particular legal doctrines, the philosophical underpinnings of legal responsibility, the relationship of law to social structures, the relationship of law to morality, the nature of legal reasoning, and critiques of law. 4 cr.

444. Science, Society and Politics
Uses the issue of climate change to explore the relationships between scientific and technical research and debate, policymaking at the international and domestic (U.S.) levels and public understanding and interpretation of complex technical issues. The course is interdisciplinary. Writing intensive. 4 cr.

500. American Public Policy
Political and economic factors that mold the processes by which American policy makers deal with such domestic issues as crime and violence, poverty and inequality, inflation and unemployment, urban blight and renewal, and energy and the environment. Writing intensive. 4 cr.

502. State and Local Government
Powers, politics, political cultures, and constitutional settings of American state and local governments. State legislatures, governorships, court systems, political parties, electoral systems, and interest groups. Structures and functions of local governments, including towns, cities, counties, and special districts. Writing intensive. 4 cr.

504. American Presidency
The President as administrator, policy maker, and political leader. The relationship between the President and the public, the media, and other governmental institutions. Historical and constitutional background of the Presidency, role and powers of the President in domestic and foreign affairs. 4 cr.

505. American Congress
Role and powers of Congress as national lawmaker and check on the executive branch: committee structure, concepts of representation, legislative oversight and party cleavage, federal budget control, and foreign policy involvement. 4 cr.

506. Parties, Interest Groups, and Voters
Role of political parties as organizers and managers of social conflict. Role of voters in controlling parties and government. Influence of interest groups in the electoral process and in governmental decision making. 4 cr.

507. Politics of Crime and Justice
Criminal justice in theory and practice; contemporary role of police, prosecutors, judges, juries, counsel, and interest groups in the administration of criminal justice. Writing intensive. 4 cr.

508. Supreme Court and the Constitution
Supreme Court treated as a political institution whose historic mission is to decide all controversies arising under the Constitution between the nation and the states, the President and Congress; the role of the judiciary in defining its own powers, rights, and duties. 4 cr.

509. Bureaucracy in America
Growth and development of the bureaucratic state. Roles and powers of administrative officials, decision making in bureaucratic settings, citizen participation, and the influence of interest groups on bureaucratic policy making. 4 cr.

510. Mass Media in American Politics
Contemporary review of media in politics; major roles of media today in providing news, setting public agenda, influencing public opinion; government regulations vs. media responsibility; future developments and consequences for American democracy. Writing intensive. 4 cr.

512. Public Opinion in American Politics
Relationship of mass and elite opinion within the context of American political culture. Impact of public opinion on American governmental policies, especially with respect to major issues facing the President and Congress. Appraisal of responsiveness to influence and responsibility to lead. Writing intensive. 4 cr.

513. Civil Rights and Liberties
Analysis of four major areas of constitutional rights and liberties—political freedom, equal protection of the laws, and due process—with particular attention to their impact on such problems as political protest, discrimination, school segregation, students rights and the relationship between government and religion. Writing intensive. 4 cr.

520. Justice and the Political Community
Origin of the idea of justice; relationship between politics, justice, and morality; selections from Plato, Aristotle, Roman, Islamic, and Christian political philosophers. 4 cr.

521. Rights and the Political Community
Human rights and the quality of communities as expressed in Hobbes, Locke, Mandeville, Rousseau, and others. 4 cr.

522. Dissent and the Political Community
Current political ideologies and controversies in America and abroad; liberal democracy and its critics since the 19th century. 4 cr.

523. American Political Thought
Introduces the student to the key questions about politics and government asked and answered by American thinkers and actors, as well as the ways in which those “answers” have shaped our institutions and political processes. Emphasizes the idea of property. Writing intensive. 4 cr.

524. Politics and Literature
Classical and contemporary works of literature to illustrate perennial issues in political philosophy; among authors studied are Aristophanes, Sophocles, Shakespeare, Melville, Tolstoy, and Sartre. 4 cr.

525. Multicultural Theory
Issues of concern generated from an attention to and appreciation of our diverse cultural identities. As a theory course in political framework, we approach multiculturalism as a new attempt to respond to the challenges that difference poses in democratic theory. 4 cr.

544. Science, Society and Politics
Uses the issue of climate change to explore the relationships between scientific and technical research and debate, policymaking at the international and domestic levels and public understanding and interpretation of complex technical issues. The course is interdisciplinary. Writing intensive. 4 cr.

545. People and Politics in Asia
Surveys the contemporary politics of nations and peoples of East Asia within the framework of their modern histories and societies. Emphasizes China and Japan, and introduces the evolving political systems of Taiwan, North and South Korea, Hong Kong/Macao. Companion course to POLT 546, but either may be taken separately. Writing intensive. 4 cr.

546. Wealth and Politics in Asia
Different paths to modernization, industrialization, and development in nations of the Asia-Pacific Rim. In-depth examinations of the challenges faced by Japan, China, Hong Kong/Macao, Taiwan and the Koreas in their search for the correct path to economic growth and prosperity, with special emphasis on each nation's distinct society and history. Companion course to POLT 545, but either may be taken separately. Writing intensive. 4 cr.

550. Comparative Government and Society
Concepts for comparing modern political systems, such as ideologies, institutions, social movements, and various forms of states, from democracies to authoritarian regimes. Illustrates concepts with examples from Western-style democracies, former communist regimes, and the developing world. Writing intensive. 4 cr.

551. Global Urban Politics
Examines the social, economic, demographic, and political processes of cities around the globe. Topics include population growth, theories of urbanization, urban economic development, urban policies toward transportation, environment, employment, housing, land, water supplies, sanitation, solid waste disposal, and infrastructure. Comparisons are made between cities of the developed and less developed nations of the world. Structures of urban and national social stratification, structures of urban and subnational governments, and political participation examined. Writing intensive. 4 cr.

552. Contemporary European Politics
Politics and governments in Western Europe, with attention to both basic characteristics of political life in different countries and current issues of politics. Writing intensive. 4 cr.

553. Politics in the Developing World
Considers patterns of political and economic development in the context of globalization. Part one addresses why much of the world has not kept pace with the industrialized democracies; part two
addresses nation-building and development efforts, with case studies from Central Asia, Latin America, the Middle East, and Sub-Saharan Africa. 4 cr.

554. Latin American Politics
Examines region-wide transitions from state-led to neo-liberal economic strategies in the 1980s and 1990s and from authoritarian to democratic political systems. Considers the results of these ongoing political and economic changes in several case study nations and the broader impacts of increased globalization and economic integration of the Americas. Writing intensive. 4 cr.

555/555W. Politics in Russia
Develops an understanding of politics in the Russian Federation. Surveys the political history of Russia from 1900 until the collapse of the Communist Party and the dissolution of the USSR. Focuses on the development of the Federation's institutions, with emphasis on the Presidency and the Parliament, federalism, the role of the people, transformation toward a market economy, and the Federation's status as a democracy. 4 cr. 5555W is writing intensive.

556. Politics in China
Dynamics of China's domestic political and economic policy processes—from massive starvation of the Great Leap Forward and the ideological upheavals of the Great Proletarian Cultural Revolution to the "Opening of China to the Outside World." Writing intensive. 4 cr.

557. Politics in Italy
Develops an understanding of the politics and political development of Italy, with an emphasis on the political system which emerged after World War II and the transformation of the 1990s. 4 cr.

558. Government and Politics of Canada
Cultural background of party competition, role of ideology, structure of government, and contemporary issues in Canadian political system. Special fee. Writing intensive 4 cr.

559. Comparative Politics of the Middle East
This intermediate-level course introduces students to the comparative political and economic study of the Middle East, as a geographical region and as an imagined construct. During the course of the semester, we will explore the creation of the modern state system, colonialism and nationalism, relations between the "West" and the "Middle East", development and environment, Islamist movements, authoritarianism and democratization, and how media and popular culture shape American and Middle Eastern perceptions. We will become acquainted with the principal theoretical approaches employed by political scientists to understand and explain these developments. By the end of the course, students should understand the principal trajectories of political-economic change within the region and be familiar with the range of theoretical approaches used by scholars of comparative politics. 4 cr.

560. World Politics
Examines the structures, processes and issues that shape contemporary international relations. Topics include: the rise and fall of the nation-state system and its current prospects, national and international security in the post Cold War era, problems of the international political economy, international conflict resolution, human rights, and global environmental politics. 4 cr.

562. Strategy and National Security Policy
Provides an overview of U.S. national security. Examines the nature of security, evolution of strategy, and the history of the United States' approach to its national security. Focuses on the policy and decision-making processes, the use of force in international affairs, and the capabilities of the U.S. military. Concludes with treatment of specific issues, including the current American security environment—state and non-state threats, contemporary military strategy, weapons of mass destruction, terrorism, peacekeeping, coercive diplomacy, alliances, and conflict management and resolution. Writing intensive. 4 cr.

565. United States/Latin American Relations
Contemporary political, economic, and social relations between the U.S. and Latin America. Topics include the pattern of U.S. response to political change in Latin America, regional cooperation, debt, trade investment, the drug trade, immigration, rising interdependence, and prospects for economic integration. 4 cr.

566. Foreign Policies of Asia and the Pacific
Analyzes the foreign policies and interactions of the four great Pacific powers: China, Japan, Russia and the United States from the breakdown of the western imperialist order and the rise of imperial Japan, the Cold War clashes in Korea and the Sino-Soviet border, to the current search for a new Pacific economic and political order. Writing intensive. 4 cr.

567. Politics of Global Resources
International politics from the perspective of the exhaustibility of global resources and the expansion of global demand. Concentrates on issues including population, food, energy, the environment, security, and human rights. Global interdependence and the appearance of new institutional frameworks of global public policy making. Writing intensive. 4 cr.

568. Introduction to Intelligence
The purpose and practice of intelligence in the national security process. Concentration on the role of intelligence in the United States involving the C.I.A., military intelligence agencies, and the practice of intelligence in other countries. Writing intensive. 4 cr.

569. Chinese Foreign Policy
Analysis of China's struggle for political and economic power in Asia and the world. Examines the legacy of China's historical encounters with the outside world, interactions with the international system since 1949, domestic determinants of foreign political and economic policies, and theories of decision making. Writing intensive. 4 cr.

571. International Politics of the Middle East
Examines inter-Arab affairs and U.S. involvement in the region. Particular focus on oil and economic, migration, transnational political ideologies (Arab nationalism, Islam, democracy), and the Arab-Israeli crisis. Writing intensive. 4 cr.

600. Selected Topics in American Politics
Special topics such as politics and public affairs in New Hampshire, women in politics, and civil liberties. See departmental listings for semester offerings. Writing intensive. 4 cr.

602A. Internship
Field experience in governmental or nongovernmental organization at the local, state, national, or international level. Arrangements must be made through the political science department. Open to juniors and seniors with at least a 3.2 GPA. Permission from the undergraduate curriculum committee of the department is required. From 2 to 12 credits maybe taken. Cr/F. 12 cr.

602B. Washington Center Internship
A four-credit independent study designed to work in conjunction with the University's Washington Center Internship program. Requirements: major in Political Science. Junior or senior research component to be discussed with faculty sponsor. For details on the Washington Center Internship, please contact Paula DiNardo, Coordinator National Student Exchange and Washington Center Internships, 114 Hood House, 603-862-3485 (TTY 862-2607), email: paula.dinaro@unh.edu. Prereq: POLT 402. 4 cr.

602C. Concord Internship Program
Provides students with field experience in state government in Concord (State Senate, House of Representatives, Office of the Governor, etc.). Students will spend three days weekly in Concord and attend a weekly practicum in Durham. Open to junior and seniors with a 3.2 or better GPA. Applications accepted in the fall semester and can be found on the department's website. Permission required. Students may sign up for 602A or any four (4) credit course along with 602C for a total of 16 credits. Cr/F. 12 cr.

602D. Internship
Field experience in governmental or nongovernmental organization at the local, state, national, or international level. Arrangements must be made through the political science department. Open to juniors and seniors with at least a 3.2 GPA. Permission from the undergraduate curriculum committee of the department is required. From 2 to 12 credits maybe taken. Cr/F. 2 to 12 cr.

620. Selected Topics in Political Thought
Selected issues in political theory, such as liberalism and conservatism, radical political thought, the American political character, and others. See departmental listings for semester offerings. Writing intensive. 4 cr.

651. Selected Topics in Comparative Politics
Specialized areas or issues such as regional politics, national politics, judicial systems, administrative law, constitutions, etc. See department listings for semester offerings. Writing intensive. 4 cr.

660. Selected Topics in International Politics
Examines specialized issues in international politics. Topics may include ethnic conflict, non-proliferation and global security, economic and political globalization, etc. See department listings for semester offerings. Writing intensive. 4 cr.

695/696. Independent Study
Designed to meet special interests of students and instructors in exploring issues in political science. Upon satisfying eligibility requirements set forth by departmental guidelines (in departmental office and on the Web), students must have the approval of a faculty sponsor. Students submit the form and all supporting evidence by mid-semester prior to the planned semester of independent study for departmental approval. Does not meet the major's four field-course requirement; maximum of 8 credits can be counted toward the non-field major requirements. Prereq: at least one upper-level course in field of independent study. 2 to 4 cr.

701. Courts and Public Policy
Impact of judicial decisions on public policy and influences on judicial decision making at the federal, state, and local levels. Writing intensive. 4 cr.

703. Urban and Metropolitan Politics
An eclectic approach to the study of urban and metropolitan politics. Topics include urban poli-
tics, forms of local government, migrations, urban development, intergovernmental relations, community power structure, urban policy making, urban service delivery, crime and law enforcement, urban bureaucracy, urban decay, and revitalization. Writing intensive. 4 cr.

704. Policy and Program Evaluation
Policy and program evaluation of federal, state, and local governmental enterprise; focuses on the politics, practices, and methods of evaluative investigation. Evaluation as a technique for providing rational information for budgetary and policymaking decisions. Writing intensive. 4 cr.

705. American Public Policy
Examination of public policy formation, agenda-setting, decision-making, implementation. Focuses on theories, models, concepts, actors, and case study examples. 4 cr.

706. State and Local Government
Advanced study of powers, politics, political cultures, and constitutional settings of American state and local government. 4 cr.

707. Criminal Justice Administration
Examines the administration and politics of police organizations, the courts, and correctional institutions. 4 cr.

708. Administrative Law
Examines the legal rules governing regulatory agencies, in the U.S. Topics include regulatory adjudication and rulemaking, legislative and executive control over administrative agencies, judicial review and public participation. Examines federal and state levels of government. 4 cr.

711. Public Opinion and Survey Research
Examines the role of public opinion in democracy. Research, design, implementation and analysis of a public opinion survey. 4 cr.

712. Leadership Theory and Practice
Explores the major theoretical approaches to leadership, including students' and others' leadership skills, styles, roles, and practices. Students will refine their own conceptual and practical approaches to leadership in a variety of settings. 4 cr.

715. Art of Negotiation
Identification, analysis, evaluation and application of effective communication and negotiation skills. Course includes case studies, and simulation/role-playing exercises. 4 cr.

721. Feminist Political Theory
Explores various strands of feminist political theory; taking a specifically political view of the challenges of feminist activism and philosophy. Addresses issues of the public space, power, social transformation, and democracy. 4 cr.

725. Politics and Literature
Seminar: Advanced work in exploring classical and contemporary works of literature to illustrate perennial issues in political philosophy. 4 cr.

743. Comparative Political Economy
Explores the origins, development, and functions of the modern state in the West, its links with markets and capitalism, and its role in contemporary political economy. Examples from various advanced industrial societies. Writing intensive. 4 cr.

750. Politics of Poverty
Examines economic development to understand causes of international inequality in the distribution of wealth. 4 cr.

751. Comparative Environmental Politics and Policy
Environmental politics and policy across national boundaries and at different levels of governance. Comparison of the U.S. and European Union environmental policies to build a foundation for comparisons across national boundaries and sub-national authorities. Students improve their understanding of how and why comparative methods are used to gain insight into policies and policymaking. Central concepts and debates addressed include the roles of expertise, sustainability, precautionary principle, the use of market mechanisms in policy, environmental justice, policy devolution and flexibility, environmental performance assessment, NGO roles, activism, and social movements. A range of theoretical approaches and historical and contemporary events and case studies, evaluating the claims and explanatory power of various concepts and theories. Includes ethical issues emerging from the theory and practice of environmental politics. Writing intensive. 4 cr.

760. Theories of International Relations
Theoretical approaches of international politics, international organization and international political economy with particular emphasis on systems theories, domestic determinants of foreign policy and theories of decision making. Writing intensive. 4 cr.

762. International Political Economy
The evolution of international economic regimes (monetary, trade, development). Particular emphasis on theoretical approaches to explain current economic problems: systemic theories (interdependence, hegemonic stability); domestic determinants (bureaucratic, interest group); and decision-making theories (rational choice). Writing intensive. 4 cr.

778. International Organization
Variations in cooperation among nations on security, economic, environmental and social issues through international organizations such as the United Nations, NATO, the World Trade Organization, and other global and regional bodies. Examines the role and influence of non-governmental international organizations. Writing intensive. 4 cr.

780. International Environmental Politics, Policy and Law
Explores international/global environmental politics and policymaking, multilateral negotiations, the role of science and technology in policymaking, state capacity, the making of international law, implementation, and compliance. Other issues include climate change, marine pollution, long-range air pollution, United States leadership in the global political arena, North-South divisions in global politics, environmental justice, sustainable development, and the role of the United Nations and other international organizations. Writing intensive. 4 cr.

795/796. Advanced Study
Senior POLT majors, with a cumulative average of 3.20 or greater, may undertake advanced study (political science), in an area of their choice, in consultation with member(s) of the faculty. Normally, the result of the project is a significant written product of a quality comparable to that done at the 700 course level. Student must initiate the project discussion and obtain approval of the undergraduate curriculum committee of the department before undertaking the project. Writing intensive. 4 cr.

797B. Seminar in American Politics
Advanced analysis and individual research. Prereq: senior standing. Writing intensive. 4 cr.

797C. Seminar in Comparative Politics
Advanced analysis focusing on government and politics in foreign nations or regions. Areas of interest may include: constitutional structures, political parties and interest groups, legislatures, bureaucracy and public policy. Topics address such concerns as religion and politics, patterns of economic development, ethnic strife, political leadership. Prereq: senior standing. Writing intensive. 4 cr.

797E. Seminar in International Politics
Advanced analysis focusing on problems of theory and contemporary issues in international politics. Areas of interest may include: democratic norms in international relations, NATO expansion and European security, the peace process in the Middle East, etc. See department listings for semester offerings. Prereq: senior standing. Writing intensive. 4 cr.

797F. Seminar in Public Administration
Advanced analysis and individual research, including opportunities for direct observation of governmental administration. Prereq: senior standing. Writing intensive. 4 cr.

797L. Seminar in Political Thought
Advanced treatment and individual research. Prereq: senior or graduate standing. Writing intensive. 4 cr.

798B. Seminar in American Politics
Advanced analysis and individual research. Prereq: senior standing. Writing intensive. 4 cr.

798C. Seminar in Comparative Politics
Advanced analysis focusing on government and politics in foreign nations or regions. Areas of interest may include constitutional structures, political parties and interest groups, legislatures, bureaucracy and public policy. Topics address such concerns as religion and politics, patterns of economic development, ethnic strife, political leadership. Prereq: senior standing. Writing intensive. 4 cr.

798E. Seminar in International Politics
Advanced analysis focusing on problems of theory and contemporary issues in international politics. Areas of interest may include: democratic norms in international relations; NATO and European security; the peace process in the Middle East; etc. See department listings for semester offerings. Prereq: senior standing. Writing intensive. 4 cr.

798F. Seminar in Public Administration
Advanced analysis and individual research, including opportunities for direct observation of governmental administration. Prereq: senior standing. Writing intensive. 4 cr.

798L. Seminar in Political Thought
Advanced treatment and individual research. Prereq: senior or graduate standing. Writing intensive. 4 cr.

799. Honors Thesis
Senior POLT honors-in-major students (see department for honors-in-major requirements), with a cumulative average of 3.20 or greater, may undertake a special honors project in an area of their choice. The results of this special project is a significant written product constituting an honors thesis, under the supervision of a faculty sponsor. Students must initiate the project discussion and obtain approval of the undergraduate curriculum committee before undertaking the project. The honors thesis constitutes the tenth course in the major. Writing intensive. 4 cr.
Psychology (PSYC)

(For program description, see page 46.)

401/401H. Introduction to Psychology
Psychology as a behavioral science; its theoretical and applied aspects. Includes research methods, behavioral neuroscience, sensation and perception, cognition, learning, development, personality, psychopathology, and social psychology. To experience actively the nature of psychological research students have an opportunity to participate in a variety of studies as part of a laboratory experience.

4 cr.

402/402H. Statistics in Psychology
Design, statistical analysis, and decision making in psychological research. Probability, hypothesis-testing, and confidence intervals. Conceptualization, computation, interpretation, and typical applications for exploratory data analysis (including measures of central tendency, variability), t-tests, correlations, bivariate regression, one-way analyses of variance, and chi square. Introduction to computer methods of computation. No credit for students who have completed ADM 430; BIOL 528; DS 420; EREC 525; HHS 540; MATH 639; MATH 644; SOC 502. Special fee, 4 cr.

444. Scientific Perspectives on Belief in Alleged Paranormal Phenomena
Examines all paranormal phenomena and various ways that people approach and attempt to understand them. Students explore alternative ways of making sense of these phenomena. Draws heavily on the social sciences (e.g., psychology, sociology, anthropology), but information and approaches from the physiological and biological sciences are introduced as appropriate. Cannot receive credit if credit earned for PSYC 591A. Writing intensive. 4 cr.

444A. Think Globally, Act Locally: The Individual in Community Context
Introduces students to the field of community psychology through both classroom work and service learning. Broadly, the course aims to help students consider questions such as: What is community? How is individual development influenced by larger community variables? What makes a strong community and what is our role in promoting changes to help our communities become more effective? Students will explore these questions through consideration of current community problems (for example, interpersonal violence, poverty) and through 20 hours of service learning during the semester. Writing intensive. 4 cr.

502. Research Methods in Psychology
Research design, including experimental and correlational design; internal versus external validity; measurement; writing a research report; graphic and statistical methods for summarizing data; sampling; and special problems such as experimenter effects, reactivity of measurement, and others. The use of hypothesis testing and data analysis in research. Prereq: PSYC 401 and 402. Special fee. Writing intensive. 4 cr.

511. Sensation and Perception
The study of how humans (and some other animals) sense and perceive their environment. Topics include seeing (vision), hearing (audition), tasting (gustation), smelling (olfaction), and the variety of state-of-the-art methods used by psychologists to study these senses. Illusions and other sensory and perceptual phenomena are treated. Prereq: PSYC 401. 4 cr.

512. Psychology of Primates
A comparative analysis of primate cognitive, linguistic, and social processes. The origins of human behavior are explored from the perspectives of history, evolution, and contemporary work in neurophysiology, linguistic, sociobiology, and related fields. Prereq: PSYC 401. 4 cr.

513. Cognitive Psychology
The study of human cognition, its basic concepts, methods, and major findings. Human knowledge acquisition and use. Attention, perception, memory, imagery, language, reading, problem solving, and decision making. Prereq: PSYC 401. 4 cr.

521. Behavior Analysis

523. Behavior Modification
The application of principles of behavior analysis to a variety of realistic non-laboratory settings, including daily life, education therapy, and self management. Examines factors governing behavior observed in the world. Prereq: PSYC 401. 4 cr.

531. Psychobiology
Introduces the behavioral neurosciences. Surveys research conducted by psychologists to learn about the biological basis of behavior: development, sensation, perception, movement, sleep, feeding, drinking, hormones, reproduction, stress, emotions, emotional disorders, learning, and memory. Prereq: PSYC 401. 4 cr.

553. Personality
Major theories, methods of assessment, and research. Prereq: PSYC 401. 4 cr.

561. Abnormal Behavior
Causes, diagnosis, and treatment of abnormal behavior. Implications of varying theoretical viewpoints. Prereq: PSYC 401. 4 cr.

571/571H. Great Psychologists
Historical introduction to some of the great psychologists and their classic works. 4 cr.

581. Child Development
The developing child in the context of his/her society. Current problems in, and influences on, development of the child. Personality and cognitive development; exceptional children. Prereq: PSYC 401. 4 cr.

591. Special Topics
New or specialized courses are presented under this listing. Staff present material not normally covered in regular course offerings. May repeat but not duplicate content. Prereq: PSYC 401. 4 cr.

591A. Special Topics/Psychology of Paranormal Belief
Examines belief in paranormal phenomena from psychological theories such as social cognition. Students who study how psychology offers insight into paranormal phenomena and the stories behind them. Science offers a way to examine these phenomena, and these phenomena, in return, are a way of examining science. Prereq: PSYC 401 or permission. No credit for students who have taken PSYC 444. 4 cr.

595. Applications of Psychology
Arranged by the student or offered by psychology faculty for supervised field, academic, or research experience related to psychology. A) Field experience: supervised internship at a business or human services setting, B) Academic experience: specialized classroom experience or supervised teaching assistance, C) Research experience: supervised research or laboratory work. Psychology instructors sponsor academic credit for appropriate experience combined with a relevant academic component. Requires a signed learning agreement prior to registration. Prereq: permission. May be taken for 1-4 credits in a semester and repeated to a maximum of 8 credits total. Cr/F 1 to 4 cr.

702. Advanced Statistics and Research Methodology
A review of basic statistics from Psychology 402 and 502. Covers partial correlation, factorial ANOVA, and other analyses that include multiple predictor variables. Appropriate for students who plan to apply to research-oriented graduate programs, those who use statistics in honors thesis research, and those who plan to work in areas such as marketing or survey research. Topics covered are appropriate for use in psychology, sociology, education, medicine, and other research areas. Prereq: PSYC 402; 502; or permission. (Not offered every year.) Writing intensive. 4 cr.
705/705H. Tests and Measurement
Testing intelligence, creativity, achievement, interests, and personality. Test construction; evaluation; relation to psychological theory, research, and practice. Prereq: PSYC 402; 502; or permission. 4 cr.

710. Visual Perception
The study of how humans (and some other animals) see. Topics include color vision, depth perception, form and pattern vision, visual learning and development, eye movements, diseases of the visual system, illusions, and other visual phenomena. Prereq: PSYC 402, 502, 511, or 531; or permission. Special fee. Writing intensive. 4 cr.

712. Psychology of Language
Theories of language structure, functions of human language, meaning, relationship of language to other mental processes, language acquisition, indices of language development, speech perception, reading. Prereq: PSYC 402; 502; 512; or 513; or permission. Special fee. Writing intensive. 4 cr.

713. Psychology of Consciousness
Explores questions of consciousness—what is it? how does it develop? are infants and animals conscious? Why did consciousness evolve? Includes a review of historical background, including the ideas of Jaynes, Piaget, James, Freud, and others. Contemporary topics may include the role of language and other representational systems, blindsight, subliminal perception, priming and other implicit cognitive phenomena, hypnosis, confabulation and attribution, dreaming, multiple personality and conceptions of self and free will, from simultaneous perspectives of phenomenology, behavior, and neuroscience. Specific topics governed by class interests. Prereq: PSYC 402; 512; or 513; or permission. Writing intensive. 4 cr.

720. Animal Cognition
Do animals use language or have a culture? Can birds count? Do animals use tools and understand how they function? How do ants navigate their environment to find food and then return to their nest? How animals perceive, attend to, process, store, and represent information from their environment? Research on animal learning and behavior as a framework for investigating cognitive processes in animal learning. Quantitative versus qualitative nature of differences between people and non-human animals. Multidisciplinary approach including the fields of anthropology, physiology, philosophy and biology. Prereq: PSYC 401; 402; 513 or 521; or permission. 4 cr.

722. Behaviorism, Culture, and Contemporary Society
Introduces behaviorism as a philosophy of science. Concentration on modern behaviorism as exemplified in the works of B.F. Skinner. Implications of behaviorism for the development and evolution of cultures. Consideration of societal issues (for example pollution, overpopulation, conflict, drug abuse) from a behavioral framework. Prereq: PSYC 402; 502; 521; or permission. No credit for students who have completed PSYC 522. Writing intensive. 4 cr.

731. Brain and Behavior
Neuropsychology, the study of brain/behavior relationships including clinical topics related to the analysis of neurological diseases in humans and more basic experimental topics related to integrative functions of the brain. The main focus is on cerebral cortex and functions related to perception, movement, attention, memory, and language. Prereq: PSYC 402; 502; 531; or permission. Special fee. Writing intensive. 4 cr.

733. Drugs and Behavior
Introduces the principles of psychopharmacology and the effects of psychoactive substances on behavior. Focuses on the therapeutic and recreational use of drugs and the mechanisms of drug action, that is how the drugs affect the brain. Neuropsychiatric function and dysfunction are discussed as they relate to the use or abuse of particular drugs. Prereq: PSYC 402; 502; 531; or permission. Writing intensive. 4 cr.

735. Neurobiology of Mood Disorders
Neurobiological and neurochemical substrates underlying various psychopathologies, using both animal models and human data. Study of disorders from the field of biological psychiatry including aggression, anxiety, panic disorder, obsessive-compulsive disorder, unipolar depression, bipolar affective disorder, schizophrenia, and post-traumatic stress disorder. The effectiveness of current behavioral and pharmacological therapy. Prereq: PSYC 402; 502; 531; or permission. Writing intensive. 4 cr.

737. Behavioral Medicine
Behavioral, physiological, and neurochemical alterations associated with health-promoting behaviors (low-fat diet, exercise) as well as health impairing behaviors (eating disorders, smoking, excessive alcohol consumption). Topics include stress, coping, type-A behavior, hypertension, and the interface of brain, behavior, and immunity (psychoimmunology, cancer, AIDS). Treatment/therapy are discussed from behavioral and pharmacological perspectives. Prereq: PSYC 402; 502; 531; or permission. Writing intensive 4 cr.

741. Advanced Topics
Advanced material in which instructor has specialized knowledge through research and study. May be repeated for different offerings. Topics under this listing may be used to fulfill a major requirement in category C I. A) Psychology as a Natural Science, B) Cognition, C) Behavior Analysis, D) Biological/Sensory. Prereq: PSYC 402; 502; plus other prerequisites when offered; or permission. Writing intensive. 4 cr.

755. Psychology and Law
Applications of psychology to the study of the law, including theories of legal and moral judgment, participants in the legal system (judges, police, victims, witnesses), the trial process, and plea bargaining. Special focus on the death penalty, the insanity plea, and child witnesses. Prereq: PSYC 402; 502; or permission. Writing intensive. 4 cr.

756. Psychology of Crime and Justice
Examines the psychological aspects of crime and justice, including the following origins and causes of crime: developmental, biological, biopsychological, learning, and mental disorder. Focuses on issues related to homicide, profiling, and serial killers. Examines aggression and violence as well as causes and consequences of criminal homicides. Discussion of the future of crime. Prereq: PSYC 402; 502; or permission. Writing intensive. 4 cr.

758. Health Psychology
Survey of current topics in health psychology, including social stress and the etiology of disease, Type A and other personality factors related to health, modification of risk factors, the practitioner-patient relationship, chronic pain, and the emotional impact of life-threatening illness. Prereq: PSYC 402; 502; or permission. Writing intensive. 4 cr.

762. Counseling
Theories of counseling, ethical considerations, professional and paraprofessional activities in a variety of work settings. Prereq: PSYC 402; 502; 553; or 561; or permission. Writing intensive. 4 cr.

763. Community Psychology
Examines the sub-field of community psychology, which grew out of clinical psychology but is different from it. Theoretical and research perspectives on prevention, diversity, empowerment, resilience, community intervention, and ecological understandings of behavior. Causes of and interventions in social issues such as interpersonal and community violence and homelessness. Prereq: PSYC 401; 402; 502; 553, 555, or 561; or permission. Writing intensive. 4 cr.

765. Dysfunctional Families and Therapy
Family structure and function. Problem cycles of functioning (dysfunction) and their impact on family members. The multigenerational nature of dysfunction. Role differentiation; physical, sexual abuse; addictive patterns; issues of power/control; problems with intimacy development; clinical methods of intervention. Prereq: PSYC 402, 502, 561, 762; or permission. 4 cr.

771. Psychology in 20th Century Thought and Society
Reassesses, extends, and integrates knowledge of 20th century psychology within the historical perspective. Major figures, schools, systems, theories. Social, institutional, and international developments since the 19th century. Review of major fields of psychology. Prereq: PSYC 402; 502; or 571; or permission. Writing intensive 4 cr.

780. Prenatal Development and Infancy
Psychological development of infants from conception through second year of life. Factors and potential influences on reproductive health and prenatal physical and behavioral development. Transition to parenthood, infant temperament and parent-infant relationships. Developmental patterns of specific capabilities. Prereq: PSYC 402; 502; 581 or PS 525; or permission. Writing intensive. 4 cr.

783. Cognitive Development
Theories of cognitive development. Comparison among major theorists on how knowledge, thought, and development are defined and studied. Current research, including cognitive development; memory; perceptual processes; language. Prereq: PSYC 402; 502; 581; or permission. Writing intensive. 4 cr.

785. Social Development
Examines development of social interactions. Emphasizes important social relationships for the child (e.g., attachment to parents and friendships with peers). Considers other topics of relevance to social developmentalists, such as temperament, aggression, social cognition, and sex roles. Prereq: PSYC 402; 502; 581; or permission. Writing intensive. 4 cr.

791. Advanced Topics
Advanced material in which instructor has specialized knowledge through research and study. May be repeated for different offerings. Topics under this listing may be used to fulfill a major requirement in category C II. A) Psychology as a Social Science, B) Social Psychology, C) Personality, D) Abnormal/Counseling, E) History of Psychology, F) Child Development, G) Adult Development. Prereq: PSYC 402; 502; plus other prerequisites when offered, or permission. Special fee with some topics. Writing intensive 4 cr.
793. Internship
Supervised practicum in one of several cooperating New Hampshire mental health/rehabilitation facilities. Coursework knowledge applied to meaningful work and team experience. Commitment includes a negotiated number of weekly work hours and weekly seminars. Supervision by institution personnel and the instructor. A maximum of 4 credits may be applied to the Psychology major. Course applications accepted beginning in March for fall term and October for spring term. Prereq: permission; PSYC major; PSYC 402, 502; 561 Pre- or coreq: PSYC 762. 4 to 8 cr.

794. Advanced Internship
Supervised advanced practicum experience in cooperating New Hampshire mental health/rehabilitation facilities. Expands and builds on experiences and skills acquired in PSYC 793. Commitment includes a negotiated number of hours of work per week and participation in weekly seminars. Supervision done by institution personnel and instructor. Prereq: PSYC 793; permission. Up to 8 credits. 4 to 8 cr.

795. Independent Study
A) Physiological, B) Perception, C) History and Theory, D) Behavioral Analysis, E) Social, F) Cognition, G) Statistics and Methods, H) Experimental, I) Personality, J) Developmental, K) Counseling, L) Psychotherapy, M) Research Apprenticeship, N) Teaching of Psychology, O) Advanced Externship (content area to be determined), arranged by the student with a psychology faculty sponsor. Learner/sponsor contract required. Minimum time commitment: three hours per credit per week. Enrollment by permission only. Prereq: PSYC 402, 502; or permission. 1 to 4 cr.

797. Senior Honors Tutorial
For senior psychology honors students. Students propose honors theses under the supervision of psychology faculty. Theses proposed and begun in this course are completed in PSYC 799. Prereq: admission to psychology honors program. (Typically offered in fall.) 4 cr.

799. Senior Honors Thesis
Under supervision of psychology department faculty members, students complete the honors projects proposed and begun in PSYC 797. The honors project, which should be empirical in nature, culminates in an oral presentation at the end of the year. Students demonstrate the elements of a scholarship project to the psychology honors program, PSYC 797. Special fee. (Typically offered in spring.) 4 cr.

Recreation Management & Policy (RMP)

(For program description, see page 81.)

444. Building a Culture of Peace
Peace is more than just the absence of war. A culture of peace incorporates respect and dignity for all persons, stewardship of natural resources, a striving toward justice and equality, the non-violent resolution of conflicts, non-hierarchical decision-making and participatory community life. Students in this course explore the origins and concepts of peace culture and experience the elements of a culture of peace as they are empowered to create a peace culture within the classroom and as they share peace culture with a broader community through service learning projects. 4 cr.

490. Recreation and Leisure in Society
Examines the historical and philosophical foundation of recreation and leisure. Emphasizes concepts, theories, and the interrelationships between factors (social, economic, political, and environmental), which influence people's leisure attitudes and behavior. Explores implications of leisure for holistic and balanced living. 4 cr.

501. Recreation Services for Individuals with Disabilities
Presents and discusses issues that concern the delivery of quality leisure services to individuals with disabilities in community settings. Lab requirements as well as classroom activities provide opportunities for practical experience. Prereq: permission. Lab. 4 cr.

502. Foundations of Therapeutic Recreation
History and professional concepts of therapeutic recreation and the roles and functions of the therapeutic recreation specialist. 4 cr.

503. Therapeutic Recreation Rehabilitation Principles & Interventions
Introduces the rehabilitation principles and recreational therapy interventions used by therapeutic recreation specialists to improve functioning for people with physical and cognitive impairments. Students explore the clinical and treatment processes of occupational and therapeutic intervention process and program planning to improve quality of life. A lab provides students with the opportunity to use a variety of assistive devices, adaptive equipment, and to support individuals and achieve maximum independence and promote a healthy leisure lifestyle. Prereq: RMP 490, 501, 502. Special fee. 4 cr.

504. Therapeutic Recreation Mental Health Principles and Interventions
Introduces mental health principles and recreational therapy interventions to improve functioning for people with emotional, social, and behavioral impairments. Students will learn and apply fundamental processes of clinical reasoning and treatment program planning to improve quality of life for persons with emotional, social, and behavioral impairments. Prereq: RMP 490, 501, 502. 4 cr.

511. Issues of Wilderness and Nature in American Society
Provides students with an overview of the evolving relationship between wilderness/nature and American society. Examines the philosophy, ethics, and societal values in American society and its relationship to our natural wilderness. Recent issues are used as case studies in order for students to articulate, defend, and critique the ethical issues presented. Students are responsible for understanding and applying philosophical approaches developed by philosophers, writers, and activists associated with the wilderness, sustainability, biodiversity, hunting, suburban sprawl, environmental activism, endangered species, organic foods, and genetic engineering. 4 cr.

557. Recreation Services Program Design
Introduces the student to a systems approach to program design. Includes needs assessment techniques, goal setting and objectives writing, process of group planning, problem identification, program evaluation, and leisure education. Applied projects are required. Prereq: RMP 490 or permission. Lab. 4 cr.

558. Program Supervision and Leadership
Emphasizes specific knowledge of leisure activity categories with related organization and leadership techniques. Other topics include facilitation of activity throughout the lifespan and planning for instruction, safety, and crisis confrontation. Applied projects are required. Prereq: RMP 557 or permission. Special fee. 4 cr.

560. Recreational Sport Management
Explores and examines the theoretical foundations and basic skill methods, and techniques necessary for the effective and efficient delivery of recreational sport programs within a variety of college, public, quasi-public, and private settings, agencies and/or organizations. 4 cr.

561. Introduction to Outdoor Recreation
The history, delivery system, social and economic impacts, and management tools for outdoor recreation. Includes identification of contemporary issues, problems, and opportunities in recreation resource management. Lab. 4 cr.

563. Recreation Management and Policy Practicum
Designed to provide first and second year RMP majors the opportunity to observe and practice leadership skills in clinical and community-based settings. Students complete a 40-45 hour practicum at an approved site. Successful completion of a practicum is prerequisite to the professional internship, RMP 664. Students are responsible for transportation and housing. Prereq: RMP 490, 501. Permission required. Cr/F. 2 cr.

570. Community Systems Planning and Development
Evaluation of principal theories of community systems and planning. Topics include problem analysis, methods of community research design, and decision-making skill. 4 cr.

593/593W. Special Topics
A) Camping and Outdoor Education for Individuals with Disabilities, B) State Parks: Their Management and Role, C) Therapeutic Recreation in the School Setting, D) Social Psychology of Leisure, E) New Hampshire's Recreation/Ski Industry, F-Z) Interdisciplinary. Specialized courses covering information not presented in regular course offerings. Description of topics available in department office during preregistration. Prereq: RMP majors or permission. May be repeated but not in duplicate areas. 2 to 4 cr. 593W is writing intensive.

600. Multicultural Perspectives and Leisure
Explores the multicultural issues within a pluralistic society both generally and as they are specifically evident through leisure, recreation, and play behaviors, values, and possibilities. Course topics and assignments applied to the exploration of three questions: 1) How does leisure expression honor, value, and preserve unique cultural and ethnic heritages? 2) Does and/or can leisure expression create meaningful bridges across interpersonal and societal differences? 3) What are the moral and ethical responsibilities and opportunities for leisure service providers within a pluralistic society? Writing intensive. 4 cr.
602. Clinical Treatment Lab I
Provides students with the opportunity to apply principles central to the effective delivery of therapeutic recreation—individualized treatment planning, client assessment, documentation, and activity analysis—with members of a community-based, post-rehabilitation program located in the Seacoast region. Students are required to participate in weekly sessions (five to six hours per week) for a total of 15 weeks. Prerequisite: RMP 490, RMP 501, RMP 502. Corequisite: RMP 603. Permission required. 2 cr.

603. Assessment and Treatment Planning in Therapeutic Recreation
Addresses the principles of activity analysis, client assessment, documentation, individualized program planning, selection of interventions, and collaboration with a treatment team. Prerequisite: RMP 490; 502. Special fee. 4 cr.

603L. Clinical Treatment Lab I
Provides students with the opportunity to apply principles central to the effective delivery of therapeutic recreation services—individualized treatment planning, client assessment, documentation, and activity analysis—with members of a community-based, post-rehabilitation program located in the Seacoast region. Students are required to participate in weekly sessions (five to six hours per week) for a total of 15 weeks. Permission required. Prerequisite: RMP 490, RMP 501, RMP 502. Corequisite: RMP 603. 2 cr.

604. Therapeutic Communication and Facilitation in Therapeutic Recreation
Addresses specific clinical knowledge and skills essential to therapeutic recreation service delivery including clinical interviewing, group process, leisure education, treatment approaches, and intervention techniques. Prerequisite: RMP 490; 502; 603. Special fee. 4 cr.

604L. Clinical Treatment Lab II
This clinical treatment lab emphasizes the concepts and intervention techniques used in the clinical application of therapeutic recreation services, which relate to practice. Students provide therapeutic recreation services to members of a community-based, post-rehabilitation program located in the Seacoast region. Students are required to participate in weekly sessions (five to six hours per week) for a total of 15 weeks. Prerequisite: RMP 603 and RMP 603L. Corequisite: RMP 604. Permission required. 2 cr.

605. Clinical Treatment Lab II
A clinical treatment lab that emphasizes the concepts and intervention techniques used in the clinical application of therapeutic recreation services, which relate to practice. Students provide therapeutic recreation services to members of a community-based, post-rehabilitation program located in the Seacoast region. Students are required to participate in weekly sessions (five to six hours per week) for a total of 15 weeks. Prerequisite: RMP 603 and RMP 602. Corequisite: RMP 604. Permission required. 2 cr.

654. Professional Development and Ethics
Focuses on preparing students for the internship experience through the identification of career goals and the selection of an approved internship site. A portfolio emphasizing process skills in resume construction, interviewing techniques, establishing internship goals and objectives, and self-assessment is developed. Majors only. Prerequisite: permission. Cr/F, IA (continuous grading). 2 cr.

663. Management and Policy in Leisure Services
Comparative analysis of administrative processes within various organizations as well as the political and policy-making roles of the managers in the private and public sectors. Emphasizes organizational development, fiscal management, and budgeting as tools used in formulating and implementing policy. Prerequisite: RMP 557 or permission. 4 cr.

664. Internship
A) Internship in Recreation Management, B) Internship in Therapeutic Recreation. Students enroll in the section corresponding to their major option after receiving approval from the academic adviser. Supervised work experience in an approved profession-related agency. An IA (continuous grading) grade (yearlong course) may be assigned at the end of the semester or summer session. Prerequisite: majors only; permission. Special fee. Cr/F. 14 to 16 cr.

665. Applied Marketing and Communications in Recreation Services
Prepares students to respond effectively to an ever-changing recreational society. Course topics are applied to the leisure service delivery systems and include microcomputer systems and applications, standardized information systems, networking, and dissemination of information through audiovisual, print, and mass media. Prerequisite: RMP 557 or permission. 4 cr.

667. Recreation Resource Planning
Overview of site-planning techniques and issues as currently practiced by recreation resource agencies at local, state, and national levels. Relationship of planning to management, policy, and practice; current trends in planning and likely future directions. Extensive use of field trips to enable students to learn how to read landscapes in order to use natural features in design as well as to enhance visitor experiences. Prerequisite: RMP 490; RMP major or permission. 4 cr.

668. Youth Culture and Program Development
Emphasizes the identification of community and personal issues youth face in growing up as well as institutional and programmatic support available to assist youth. The course also examines the leadership, administrative, financial, and marketing tools necessary to develop successful youth programs and services. Prerequisite: RMP 490 or permission for non-majors. Writing intensive. 4 cr.

680. Festival and Event Planning
Introduces the planning, marketing, management, and evaluation of festivals and special events. Explores the theories and practices relevant to successful event planning for host community residents and visitors. 4 cr.

700H. Senior Honors Project
Under the direction of an RMP faculty member, students complete either a supervised research or applied field study project that builds on their honors coursework. Students submit a written proposal for approval and present the results at the completion of their project. Applied studies address a specific need or problem of a local agency or organization. Prerequisite: permission required. 4 to 6 cr.

705. Management and Policy in Therapeutic Recreation
Addresses National Council for Therapeutic Recreation Certification knowledge areas concerning management competency. Students acquire knowledge of current principles and procedures for assuming an administrative role in the therapeutic recreation profession. Issues and practices related to budgeting, reimbursement, quality improvement programs, and comprehensive program planning. Prerequisite: RMP 502; 603; 604. 4 cr.

711. Recreation Resource Management
Examines the supply and demand of natural resources for outdoor recreation uses, with emphasis on relationships between public and private roles and responsibilities. Social, environmental, and economic impacts of outdoor recreation use are discussed. Current principles and techniques of recreation resource planning and management are outlined. Prerequisite: seniors or permission. 4 cr.

724. Grantsmanship, Evaluation, and Research
Emphasizes understanding and application of grantsmanship, research techniques, and research writing. Addresses the process of program planning and grant proposal development. Examines research methodologies and the evaluation processes as applied to recreation and allied health settings. Critical assessment of uses and limitations to effective recreation. Prerequisite: RMP 557, 663 and senior RMP major or permission. Writing intensive. 4 cr.

730. Camp Administration and Leadership
Provides students with an understanding of administrative and organizational practices in structured camp settings. Students are exposed to the theory, practice, and challenges of program planning for youth and adult development within the recreation context of camping. Explores current sociological, environmental, economical, and legislative trends influencing contemporary camp management. Permission required. 4 cr.

743. Culture and Environmental Interpretation
This course focuses on the communication process and practices used by parks and recreation professionals to explain and interpret the special characteristics of cultural and environmental resource sites for visitors. Conceptual principles for planning interpretive programs, as well as techniques for analyzing and disseminating information and entertainment through various media (personal interactions, verbal presentations, exhibits, publications, and other programs) will be discussed. Delivery of interpretive messages across a variety of audiences, strategies for programming interpretive services, and the administration and evaluation of interpretive services in recreation settings will be examined. 4 cr.

760. Community Sport Organizations: Administration and Development
The administration and development of participant-based community sport organizations and resources. Emphasizes the organizational, administrative, and programming competencies necessary to effectively manage community sport organizations. Focuses on problems and research-oriented solutions related to the management of community sport organizations. Prerequisite: RMP 560 or permission of the instructor. 4 cr.

770. Management and Design of Recreation and Park Facilities
Provides students with an orientation to the theories, design, operation, and functions of recreational facilities. Topics include facility development, operational considerations, and auxiliary functions that impact the manager's role. Students gain insight into key areas of facility management through visitations to actual facilities. Prerequisite: RMP 705; permission. Special fee. 4 cr.
772. Law and Public Policy in Leisure Services
Topics including the law of torts, contracts, property, civil rights, risk management, and legal research are addressed in the context of leisure services and recreation resources. Public policy and professional advocacy implications are examined in relation to legislative and judicial systems. Prereq: RMP 557, 663, and senior RMP major or permission. Writing intensive. 4 cr.

775. Entrepreneurial and Commercial Recreation
Principles of business planning and development as applied to the private sector leisure services industry. Emphasizes knowledge of key commercial leisure services profiles and their intersection with allied professions such as hospitality and tourism. Course topics include entrepreneurship, business planning, needs assessment, product development, selling, financing, legal designations, and business operations leading to the development of a business plan for a new entrepreneurial recreation enterprise. Prereq: RMP 663. 4 cr.

793. Advanced Topics
A) Area and Site Planning, B) Concepts and Trends in Therapeutic Recreation, and C) Conference Planning. Topics presented by instructors with specialized knowledge gained through professional practice, research, and study. Descriptions of topics available in department office during preregistration. May be repeated but not in duplicate areas. 2 to 2 or 4 cr.

796. Independent Study
Individual study and/or research relating to leisure-oriented topics. Prereq: permission. 1 to 4 cr.

Religious Studies (RS)
(For program description, see page 29.)

483. History of World Religions
Introduces the religions of the world in terms of historical development, relationship to society, belief system, central texts, and ritual practices. (Also offered as HIST 483.) Writing intensive. 4 cr.

484. Patterns in World Religions
Introductory course on the comparison of religions and religious patterns. Examining cross-cultural themes such as sacred places, sacred books, and sainthood, students become acquainted with the concepts and methods used in the historical study of religions. Primary and secondary readings encompass a wide variety of religious practices and ideas. (Also offered as HIST 484.) Writing intensive. 4 cr.

576. Hebrew Bible in Historical Context
An introductory study of the Hebrew Bible, or Old Testament, examining the development of biblical literature in the context of ancient Near Eastern cultures and history. Includes the interpretation of creation stories and the patriarchal narratives using literary and folklore methods, the transformation of Israelite religion from Moses to David to Ezra, the role of prophets and nature of ancient prophecy, the concept of the messiah, “wisdom” literature and the biblical interpretations of misfortune, the formation of a biblical canon, and the critical analysis of sacred texts. (Also offered as HIST 576.) Writing intensive. 4 cr.

600. Special Topics
Studies of particular religious traditions, or periods within those traditions, or special topics and issues of concern within religious studies such as method, ritual, mysticism, etc. 4 cr.

601. Seminar in Religious Texts
Close study of sacred texts from a particular religious tradition (Islam, Christianity, Buddhism, Judaism, etc.) or a thematic selection of texts across religions. (Also offered as HIST 601.) 4 cr.

607. Religion in American Thought and Life
Interdisciplinary study of the varied nature of American religious experience and its relationship to other aspects of American culture. Topics vary from year to year, and may include the interdisciplinary study of a spiritual community, African American religious history, material culture and spiritual expression, politics and religious free speech, religious culture in the nineteenth century, multi-ethnic religions, and literature. (Also offered as AMST 607.) Writing intensive. 4 cr.

617. Religion, Culture, and Conflict in South Asia
Explores connections between religion and violent conflict in South Asia. Includes overviews of three great religious traditions of the region: Buddhism, Hinduism, and Islam, and how they are realized in the daily lives of South Asian practitioners. Ethnographic case studies of religious violence, coupled with readings in contemporary theory, to understand how and why violence is produced by considering not only religious belief and practice, but also such factors as colonialism, postcolonial politics, the social processes of contemporary diasporas, economic structure and change, and international religious movements. Prereq: at least sophomore standing. Anthropology or religious studies background is recommended. (Also offered as ANTH 617.) Writing intensive. 4 cr.

682. Cults and Charisma
Examines religious sects and charismatic leaders using case studies from history and the contemporary world, as well as analytical principles from religious studies and anthropology. Explores various approaches to the question, What makes a person powerful over others? in connection with the formation of messianic sects, the genesis of the “cult,” the traditional authority of priests and kings, sainthood, the events at Jonestown and Waco, and the popular image of the “cult.” Students learn to employ a variety of tools and models to understand historical situations of charismatic leadership. (Also offered as HIST 682.) 4 cr.

689. New Testament in Historical Context
A study of the collection of writings known as the New Testament as both literature and historical documentation. Assigned readings from primary and secondary sources stress the historical, social, religious, and literary backgrounds of the Gospels, Paul’s letters, and the Apocalypse, and include a variety of early Christian texts left out of the canonical New Testament. Other more general themes are the formation of the Christian canon, the division of the “Jewish”-movement from Judaism, the status of Jesus in his own time, the nature of parables, the end of the world, and the authority of women in early churches. Examines the historical understanding of sacred scripture. (Also offered HIST 689.) Writing intensive. 4 cr.

699. Seminar in Religious Studies
Advanced discussion of a particular theme in religious studies, meant both to give students a solid foundation in classic theories of religion and to explore new authors and ideas. Past topics have included ritual, possession, magic, and apocalypticism. Classes are in seminar format and culminate in a final research paper. (Priority to minors in Religious Studies.) Prereq: permission. 4 cr.

770. Anthropology of the Sinister
Examines narratives of the sinister stories about witches, demons, vampires, and extraterrestrials that are told as if true. Investigates the cultural, political, and economic contexts of their production. V ariants of the sinister are compared cross-culturally and trans-historically. Links between a recent worldwide upsurge in narratives of the sinister and the processes of globalization and modernity are emphasized. Seminar format; open only to juniors and seniors. (Also listed as ANTH 770.) 4 cr.

795, 796. Independent Study
Independent study of traditions, topics, or figures within the scope of Religious Studies. Before registration, student must formulate a project and secure consent of a cooperating program/faculty member who will supervise the independent study. 2 or 4 cr.

Russian (RUSS)
(For program description, see page 42.)

401-402. Elementary Russian
Oral-aural practice and written drills designed to achieve a mastery of basic grammatical patterns. Language lab and computer lab work. For students without previous training in Russian. Special fee. 4 cr.

425. Introduction to Contemporary Society and Culture
Introduction to contemporary Russian society and culture in English. Examines the “Russian mind” (as it was before 1917), the “Soviet mind,” and how the two have clashed. A closer examination of how the Russians are adapting to the changes that have taken place in their country since the collapse of communism. Readings, films, media. Themes to be discussed include leadership; authority and power; the Russian soul; family, women, youth, education, holidays and celebrations; the new Russians. Special fee. 4 cr.

426. Film and Communism
Examines Soviet/Communist mythology from its birth to its deconstruction through film. Particular attention is focused on the instructive nature of Soviet film (1917-1991) and the cultural idioms used in this medium. Taught entirely in English. Films, readings, lectures, discussion. No prerequisites. Special fee. 4 cr.

500/500W. Selected Topics in World Literature
Topics are chosen that introduce students to major themes and genres. (Also offered as CLAS 500, FREN 500, GERM 500, ITAL 500, PORT 500, SPAN 500.) May be repeated for credit. Special fee. 4 cr. 500W is writing intensive.

503-504. Intermediate Russian
Continuation of RUSS 401-402. Review of Russian grammar, and practice in oral and written expression. Prereq: RUSS 402 or equivalent high school or college course with a grade of C or better. Special fee. 4 cr.
521/521W. Devils, Deities, and Madness in Russian Literature
Introduces Russian literature from a variety of perspectives. Selected works by famous and lesser known Russian writers on themes of devilry, deities, and madness. Literary texts, as well as film versions of literary texts, are considered in their historical and cultural contexts. Lectures, readings, and discussions in English. Open to all students, including freshmen. No prerequisites. Special fee. 4 cr. 521W is writing intensive.

522/522W. Morality, Sex and Revolution in Russian Literature
Introduces Russian literature from a variety of perspectives. Selected works by famous and lesser known Russian writers on themes of morality, sex, and revolution. Literary texts, as well as film versions of literary texts, are considered in their historical and cultural contexts. Lectures, readings, and discussions in English. Open to all students, including freshmen. No prerequisites. Special fee. 4 cr. 522W is writing intensive.

593/593W. Myths, Visions and Issues in Russian Literature and Society
Discussion and analysis of topics and authors in Russian literature, film, and culture. A variety of different topics or authors is covered each semester: A) the Giants of Russian Literature: Dostoevsky and Tolstoy, B) Dostoevsky, C) Tolstoy, D) Jewish Voices in the Russian Empire, E) The Devil in Russian Literature, F) the Myth of St. Petersburg, G) Death and Revolution, H) Russian Fairy Tales, I) Drama, J) Women’s Voices, etc. Lectures, readings, and films with English subtitles, and discussions in English. Open to all students. Special fee. 4 cr. 593W is writing intensive.

601. Russian Conversation and Phonetics
Practical application of fundamental phonetic theory of spoken Russian. Designed to increase fluency and accuracy in conversation. Prereq: RUSS 504 with a grade of C or better; permission. Special fee. 4 cr.

631, 632. Advanced Russian Conversation and Composition
Advanced spoken and written Russian designed to maintain aural-oral fluency; emphasis on expression and advanced grammatical structures. Prereq: RUSS 503-504 or equivalent with a grade of C or better. Special fee. 4 cr.

685, 686. Study Abroad
Studies at a Russian institution of higher learning. Interested students should consult with a Russian adviser. Prereq: primarily for juniors and seniors who have completed RUSS 632 or equivalent with a grade of B (3.00) or better. Special fee. Cr/F. (IA grade will be assigned until official transcript is received from the foreign institution.) 16 cr.

691/691W. Readings in Russian Literature
Linguistic and stylistic characteristics of works of important authors of the 19th and 20th centuries. Readings, lectures, and papers entirely in Russian. Special fee. 4 cr. 691W is writing intensive.

693/693W. Myths, Visions and Issues in Russian Literature and Society
Same as RUSS 593, except that in addition majors are required to do selected readings in Russian and/or conduct research assignments in English on a specified topic. Final project required. Writing intensive option. Special fee. 4 cr. 693W is writing intensive.

721/721W. Topics in Contemporary Russian Literature: From Chekhov to Post-Modernism
Reading, discussion, and close analysis of works of prose fiction and/or poetry from post-19th-century Russian literature within various contexts (literary-historical, socio-political, cultural, artistic, etc.) of the given period. All readings, written assignments, and class discussion in Russian. Prereq: RUSS 691 or equivalent or by permission. Special fee. 4 cr. 721W is writing intensive.

725/725W. Topics in Russian Culture and Society
Historical, geographical, social, political, intellectual and artistic developments in Russia that have influenced contemporary Russian society and culture. Readings, class discussions, and films. Conducted entirely in Russian. Special fee. 4 cr. 725W is writing intensive.

733. History and Development of the Russian Language
Overview of the changes in sounds, structure, and vocabulary from Proto-Indo-European through Old Church Slavonic, Old Russian, to contemporary Russian. Readings in culture and civilization parallel to the chronology of the studied linguistic period. Prereq: grade of C or better in last Russian course taken. Special fee. 4 cr.

790. Advanced Language and Style
For students who have a strong, active control of grammar. The most difficult problems of Russian grammar and syntax in poetry and prose. Develops confidence in exposition both in everyday situations and in abstract concepts (emphasis on the latter). Prereq: grade of C or better in last Russian language course taken. Special fee. Barring duplication of material, may be repeated for a maximum of 8 credits. Writing intensive. 4 cr.

795, 796. Independent Study
Open to highly qualified juniors and seniors. To be elected only with permission of the Russian program coordinator and the supervising faculty member or members. Barring duplication of subject, may be repeated for credit. Special fee. 1 to 4 cr.

797, 798. Special Studies in Russian Literature, Language, and Culture
Selected topics in language, literature, and culture. Barring duplication of subject, may be repeated for credit. Special fee. 2 or 4 cr.

Social Science (SCSC)

681. Internships
Fieldwork in a state or local government department, agency, or institution, or in an approved private agency. Work is under supervision of agency. Department chairperson or representative is responsible for arranging the program. Offered through departments of history, political science, psychology, sociology, and anthropology. Prereq: senior standing; Special fee. 10 cr.

682. Washington Internship
Internship placements in Washington, D.C., through the Washington Center. Individual internships arranged with legislative and judicial offices, law firms, public interest organizations; in the arts, the media, labor, international affairs, business, consumer affairs. Supervision by agency personnel and faculty sponsor. Students should have above-average academic records before applying. Open to all majors. Applications available in the National Student Exchange Office, Hood House. Prereq: junior or senior. Students must also register for a graded, 4-credit independent study in the student’s major. credit variable to 12 credits. Special fee. Cr/F. 12 cr.

Social Work (SW)

(For program description, see page 82.)

424. Introduction to Social Work
Introduces the learner to the field of social work with emphasis on the "person-in-environment" and attention to a range of practice approaches to understanding and assisting the human condition. An overview of the history, values, and ethics of the profession. Includes various fields of practice in which social workers are employed. 20 hour/semester service learning experience at community social service agencies required. Special fee. 4 cr.

444. You’ve Got Your Troubles, I’ve Got Mine
A seminar for traditional first- or second-year students. Examines the many personal losses typical for students leaving home for the first time. Guest speakers from various disciplines (e.g., social work, therapeutic recreation, nursing, family studies). The various ways one might and give informal support to others dealing with loss are explored. In addition, the personal responses allowing one to better cope with adversity and ways of expressing grief are explored. Group work brings the class together as an informal support network. Students exchange ideas in techniques used to deal with personal loss and develop an informal support network to use after the course has ended. 4 cr.

An overview of the history and current status of social welfare policy in the United States. Considers the origins, development, and analysis of significant policies, values, attitudes and other issues related to the social welfare system and the delivery of service. Focuses on policy analysis from a social and economic justice perspective. 4 cr.

550. Human Behavior and Social Environment I
Introduces human behavior and development as it influences and is influenced by multiple factors in the social environment, including individual genetic and biological composition, race, gender, age, socioeconomic status, ethnicity, geographic location, physical appearance, and ability. How these factors operate throughout the life cycle. Provides a knowledge base and perspective to understand a client’s behavior, attitude, and values in relation to the attitudes and values of the social work profession and the larger society. 4 cr.

551. Human Behavior and Social Environment II
Continuation of 550. Agents of socialization that most significantly affect family, group, and organizational development and behavior within an ecosystems framework. Particular attention to the influence of class, gender, race, ethnicity, religion, age, sexual orientation, and other aspects of diversity on development and behavior. 4 cr.
Introduces students to practitioner-researcher role in social work. Critical evaluation of, and introduction to research including project design, survey and evaluative methodologies. Introduction to statistics used in research process. Each student completes an individual research project. Cannot be taken for credit after SOC 601 or PSYC 502. Prereq: SW 424 and junior or senior standing or permission. Writing intensive. 4 cr.

622. Social Work Practice: Interventions with Individuals and Families
Introduces methods and practice. Basic principles, values, and ethics, interviewing skills, problem assessment, social contracting. Skills training in lab sessions. Should be taken in junior year. Prereq: SW 424 or permission. Writing intensive. 4 cr.

623. Social Work Practice: Interventions with Groups, Organizations and Communities
Continuation of SW 622. Delineation and study of intervention and change strategies differentiated with individuals, groups, and communities. Prereq: SW 622. Writing intensive. 4 cr.

Builds on the curricular content covered in Introduction to Social Welfare Policy (SW 424). Both courses view social welfare policy as the framework from which social work services are developed and delivered. This course examines the macroeconomic context for policy analysis and advocacy as it integrates policy and practice through student research and analysis of specific social problems. Policymaking is analyzed in legislative, community, organizational, and global environments emphasizing advocacy in the pursuit of social and economic justice. Prereq: SW 424, SW 525. Special fee. 4 cr.

640. Social Work Field Experience I
Majors are placed in a social welfare setting for a minimum of 225 hours; individual arrangements with faculty coordinator. Prereq: SW 622 and permission. Must have senior status. Coreq: SW 640A. Special fee. (No credit toward a minor.) Cr/F. 5 cr.

640A. Social Work Field Experience I: Seminar
On-campus seminar for all seniors in field work. Emphasizes processing field experiences and achieving competency in skills of completing an interview and assessment within ethical boundaries of the profession. No credit toward minor. Prereq: SW 622.Coreq: SW 640. 3 cr.

641. Social Work Field Experience II
A continuation of SW 640 with a minimum of 225 hours. Prereq: SW 640 and permission. Coreq: SW 641A. (No credit toward a minor.) Cr/F. 5 cr.

641A. Social Work Field Experience II: Seminar
Continuation of 640A. Emphasizes intervention and termination skills, self awareness, and moving into the professional world. Must have senior status. No credit for minor. Prereq: SW 640 and 640A. Coreq: SW 641. 3 cr.

697. Special Topics in Social Welfare
Seminar for advanced majors. Topics may include: A) Alcohol and Alcoholism, B) Drugs and Chemical Dependency, C) Income Maintenance, D) Health Care, E) Child Welfare, F) Aging, G) Mental Health, or H) Developmental Disabilities. May be repeated for different topics. Prereq: permission. 4 cr.

701. Women and Aging
Analysis of the major theories about social conditioning of aging women and its effects in contemporary society. Human service response, psychosocial, biological, legal, and economic implications. Prereq: senior status or permission. 4 cr.

705. Child and Adolescent Risks and Resiliency: Program, Policy and Practice
Examination of the major policy and program questions of child welfare with a focus on child care and protection, adoption and foster care, juvenile delinquency, service delivery, and concepts of treatment in public and private programs. Prereq: senior status or permission. 4 cr.

711. Understanding Mental Illness
An overview of the public mental health system focusing on people affected by severe and persistent mental illness. Reviews the current service system and its history; major mental illness, psychosocial rehabilitation, and treatment; and community support systems. Prereq: Senior status or permission. 4 cr.

712. Understanding Developmental Disabilities
Analysis of the complex social contexts of people with developmental disabilities. Explores and questions traditional approaches and the current system. Examines family and community services and resources. Prereq: Senior status or permission. Special fee. 4 cr.

715. Practice with Gay, Lesbian, Bisexual, and Transgender People
Sexual minorities constitute the minority group social workers most consistently encounter wherever they work. Addresses practice with gay, lesbian, and bisexual people on both professional and personal levels for the social worker. The readings include theoretical, experimental, clinical, counseling, and personal perspectives, as well as providing an introduction to the gay/lesbian/bisexual subculture. A unit on gender minorities is included. Students are also required to explore and examine their own attitudes and assumptions about gays, lesbians, bisexuals, and gender minorities. Senior status only. (Also offered as SW 815.) 4 cr.

785. Study Abroad: Comparative Social Welfare Systems
Students examine the historical development of social welfare in another country including an analysis of the underlying values and attitudes that dictate policy and practice decisions. Includes agency site visits, lectures, themed readings, and visits to important cultural sites. Prereq: SW 424 and SW 525. Special fee. 4 cr.

795. Independent Study in Social Service
Independent work under department faculty guidance. Enrollment by permission only through arrangement with specific faculty. May be repeated with a different focus to maximum of 8 credits. Prereq: 12 hours social service coursework; permission. Cr/F. Special fee. 1 to 6 cr.

796. Independent Study: Teaching Assistant
Participating students provide leadership and supervision for small groups of social work majors in social work practice simulations. Student teaching assistants work closely with, and under the direction of, department faculty. May be repeated to a maximum of 8 credits. Prereq: senior status; 16 hours in social work; and permission. Cr/F. 1 to 6 cr.

Sociology (SOC)

400/400H/400W. Introductory Sociology
Overview of sociology as the scientific study of human social and cultural relationships. Social theory, methods and techniques of research, and current research findings on a wide range of social issues. Special fee on some sections. 4 cr. 400W is writing intensive.

444. Social Mobility and Social Change
Uses a multidisciplinary perspective to examine the major social and economic trends that have affected American mobility patterns since the 1930s. The primary goal of the course is to help students ask and answer questions about the processes of social mobility and social change. Students learn how social scientists formulate research questions, how they collect and analyze data to answer those questions, and how their findings shape scholarly debates and public policy. Writing intensive. 4 cr.

500/500W. Self and Society
Examines meaning and interaction at the individual level of society. Considers reciprocal relationships between self and society, including: 1) the nature of the self concept, identity formation processes, and the fulfillment of social roles; and 2) the impact of social structure on thoughts, feelings, and behavior. 4 cr. 500W is writing intensive.

515. Introductory Criminology
Introduces the scientific study of crime. Reviews the different forms of criminal behavior, theories of crime, and strategies of crime control. 4 cr.

520/520H. Family
Sociological study of marriage and the family in American society. Following a life-cycle approach, topics include gender roles, communication and conflict, dating and mate selection, work and family economics, the transition to parenthood, middle- and late-life family, divorce, and remarriage. 4 cr.

525. Juvenile Crime and Delinquency
Crime, violence, and the criminal justice system as it affects children and youth in the role of both perpetrators and victims. 4 cr.
530/530W. Race and Ethnic Relations
Majority-minority group relations; special attention to nature and results of black-white and ethnic group relations in the United States. 4 cr. 530W is writing intensive.

535. Homicide
Introduces to theory and research in homicide studies, including a review of the origins of and social responses to homicide. 4 cr.

540/540W. Social Problems
Relation of customs and institutions to such social problems as crime, delinquency, alcoholism, physical and mental disease, sexual deviance, poverty, old age, broken families, and racial and religious prejudices. Especially for non-majors. 4 cr. 540W is writing intensive.

570. Sexual Behavior
A comparative approach to questions of the universality and variability of human sexual behavior. Topics include the changing expression of sexuality at various stages of the life cycle, patterns of arousal and response for each sex, the social control of sexuality, and sexual dysfunction 4 cr.

580. Arts in Society
Students attend live concerts of "classical" music, dance, opera, and theatre; as well as visit art museums and architectural monuments in the region. Assigned readings and introductory lectures precede the performances and art trips, and response papers and discussion follow them. While exposure to “live” art is primary, events are related to other institutions that constitute society—the family, education, the economy, religion, and government, again through assigned readings, lectures, and discussion. (Also offered as INCO 480.) Special fee. 4 cr.

595. Independent Reading and Research
Independent study of advanced or specialized topics in sociology requiring extensive reading and writing. Before registering, students must develop a project in consultation with a faculty supervisor and submit a proposal to the undergraduate committee. Prereq: 12 sociology credits and permission. 2 to 8 cr.

597. Special Topics
Occasional or experimental offerings. May be repeated for different topics. 4 cr.

599. Sociological Analysis
Basic skills essential to sociological study; including: development of critical reading skills; evaluation of theory construction and evidence; analysis of classical and contemporary works, research, writing, and use of library resources. To be taken by sociology majors no later than the junior year. Special fee on some sections. Writing intensive. 4 cr.

601. Methods of Social Research
Overview of major research methods: survey analysis, personal interview, participant observation, content analysis, and experimental design. Each student designs and completes a research project. Prereq: SOC 502 or equivalent and SOC 599; juniors and seniors only. Writing intensive. 4 cr.

611. Sociological Theory
Analysis of the origins and development of sociological theory. Includes the classical works of Marx, Weber, and Durkheim and their connections to the major strands of present day research. Writing intensive. 4 cr.

612. Topics in Sociological Theory
Major schools, concepts, and issues in present-day sociological theory. Functionalism, conflict theory, feminist theory, social constructionism, systems theory, critical theory, and hermeneutics are among the possible topics. Prereq: SOC 611. Writing intensive. 4 cr.

620. Drugs and Society
Provides students with an overview of drug use and behavior as viewed from a sociological perspective. Highlights historical and current drug use trends, examines the social correlates of drug use, considers societal responses to drug use including treatment, prevention, and policy, and engages students in key controversial debates confronting U.S. citizens and policymakers. Provides a foundation for understanding of drugs and society. 4 cr.

630. Sociology of Gender
Gender examined as 1) socially constructed differences between the sexes, and 2) a system of social relations, which are part of the fabric of our social institutions. Topics include gender socialization, gender and education, gender and employment, and work-family intersections. Attention paid to the issue of gender inequalities and to the intersection of class, culture, race-ethnicity, age, and sexual orientation with gendered experience and gendered institutions. Focuses primarily on the contemporary United States. 4 cr.

635. Medical Sociology
Interrelationship of health, medicine, and society; the social construction of wellness, illness, and healing; age, sex, class, and ethnicity in medical care; institutional networks and the social control functions of medicine; roles and relations of physicians, patients, nurses, and other health workers; medicine in a cross-national context. Writing intensive. 4 cr.

640. Sociology of Religion
The continuing significance of religion in society is a central area of sociological inquiry. Examines the historical and cultural explanations for the persistence of religion and apply diverse sociological perspectives to explaining the personal, institutional, and cultural relevance of religion with a focus on contemporary American society. Topics studied include religious authority, identity, violence, and the impact of religion on various domains of social life including gender relations, family, politics, and economy. Writing intensive. 4 cr. 645/645W. Class, Status and Power
Focuses on the major dimensions of inequality, including class, gender, and race, by exploring the distribution of economic, political, and social resources within contemporary societies. 4 cr. 645W is writing intensive.

650. Family Violence
Various forms of family and intimate violence, including child physical abuse, sexual abuse, spouse assault, dating violence and elder abuse, their characteristics and dynamics, place within larger social trends, the theories that explain their occurrence and effects and the major social institutions that respond to them. Juniors and seniors only. 4 cr.

655. Sociology of Law and Justice
Systematic study of how social factors, such as inequality, differentiation, culture, and institutions influence the justice process. Historical and cross-cultural focus on the behavior of the police, courts, and other legal institutions. Prereq: SOC 515 or permission; juniors and seniors only. 4 cr.

660. Urban Sociology
Focuses on urban communities, urbanization, and urban social issues. Covers the historical development of cities; the differences between urban, suburban, and rural communities; urban life styles; and the significance of poverty and race for understanding contemporary American cities. Emphasizes American cities, with some consideration to world patterns of urbanization and the growth, development, and role of global cities. Writing intensive. 4 cr.

665. Environmental Sociology
Interactions between society and the physical environment, including environmental constraints, population and economic growth, social impacts of resource development, large-scale environmental change, and the social bases of environmental attitudes, behavior, and politics. Writing intensive. 4 cr.

670. Sociology and Non-Fiction Film
Examines nonfiction films as both a method of exploring social life and a cultural product that reflects its social environment. Among the topics to be addressed are the use of photographic images in social science research, the historical development of documentary film, and the critical analysis of visual images. 4 cr.

675. Sociology of AIDS
Seminar class addresses social, political, emotional, and biological dimensions of HIV infection and AIDS. Specific topics include the social epidemiology and etiology of AIDS, stigmatization and the social construction of disease, community action, AIDS prevention, and ethical issues in the health care of people with AIDS. 4 cr.

680/680W. Sociology of the Holocaust
Examines the origins, realities, and consequences of the Holocaust as an all-embracing European phenomenon. Topics include the genocidal policies and procedures of the Nazis and Soviets with respect to indigenous populations as well as the role of collaborators. This course is normally offered only at UNH-Manchester. 4 cr. 680W is writing intensive.

685. Work and Occupations
Examines the changes in workplace organizations and workers’ lives as the U.S. became first an industrial society, and later, a postindustrial nation. Emphasizes how and why workers’ rights have been contested as well as how and why racial, ethnic, and gender segmentation emerged and persist. 4 cr.

690. Ethnographic Field Research
Explores history, theory, and practice of ethnographic research. Students read and practice such techniques as mapping, taking life histories, compiling genealogies, and analyzing use of space, language, and rituals. Each student also carries out, writes, and presents an independent research project. Prereq: ANTH 411 or SOC 400; one 500-level or higher anthropology or sociology course; or permission. No credit for students who have completed ANTH 630. Writing intensive. 4 cr.

695. Research on Family Violence in World Perspective
The nature, frequency, causes, and consequences of family violence, including physical, verbal, emotional, and sexual abuse of children, is examined. Prereq: ANTH 411 or SOC 400; one 500-level or higher anthropology or sociology course; or permission. No credit for students who have completed ANTH 630. Writing intensive. 4 cr.
697. Special Topics
Occasional or experimental offerings. May be repeated for different topics. Writing intensive. 4 cr.

699. Senior Thesis
Independent work in the library or field culminating in a written senior thesis. Recommended for, but not confined to, majors intending to pursue graduate studies. Students must arrange for supervision from two faculty members and submit a proposal to the Undergraduate Committee before registering. May be completed in one or two successive semesters during the senior year. Permission required. 4 or 8 cr.

699H. Senior Honors Thesis
Independent work in the library or field culminating in a written senior honors thesis and a formal research presentation. Recommended for, but not confined to, majors intending to pursue graduate studies. Required for students participating in the departmental honors program as part of their 16 honors credits. Students must arrange for supervision from two faculty members and submit a proposal to the Undergraduate Committee before registering. May be completed in one or two successive semesters during the senior year. Permission required. 4 or 8 cr.

715. Criminological Theory
Introduces graduate students and advanced undergraduates to the major theoretical literature in crime and delinquency. Covers both classical and contemporary theory, with empirical assessments of theories, including macro- and micro-level control, strain, and learning theories, as well as recent developments in biosocial, deterrence, labeling, and critical/feminist theories. Prereq: SOC 502, 515; juniors and seniors only. 4 cr.

720. Sociology of Drug Use
Examines licit and illicit drug use from a sociological perspective. Draws primarily from the sociology of mental health and criminology to explore a variety of drug-related topics including historical and current U.S. drug trends, dominant theoretical approaches about the initiation into, and continued use of drugs, drug-related crime, therapeutic use of drugs, prevention and treatment of drug problems, and drug-related policies. 4 cr.

#730. Political Sociology
Contemporary issues in political sociology, with emphasis on the relationship between social class structure and political power. Explores various perspectives on the nature and distribution of power, theories of state, class structure and political participation, and the politics of policy making. 4 cr.

740. Sociology of Mental Health
Introduces students to different sociological approaches for studying and understanding mental health and illness. Students examine the social distribution of mental illness in the United States and the social-structural factors that help to explain mental health variations. Also addresses issues surrounding mental health treatment, systems, and policies for the mentally ill. 4 cr.

741. Social Change and Development
Examines theoretical and empirical work on social change and development, and explores on-the-ground efforts to alleviate poverty and stimulate equitable development. Reliance on key concepts of class, culture and politics; attention to the role of technology and the importance of the environment. Focuses on social change in America from 19th century to the modern post-WWII era and on change and development in developing countries throughout the world. Permission required. 4 cr.

742. Sociology and Social Policy
Social policy and public policy defined: description of the policy-making process. The political sociology of the policy-making process; who makes policy and who influences policy, under what conditions and with what effect. Definition of social policy research and the various roles social scientists can adopt for policy-relevant work. Students are responsible for critiquing the readings and for preparing a substantial research paper. 4 cr.

745. Race, Ethnicity, and Inequality
Sociological perspectives on race and ethnic relations for graduate and advanced undergraduate students. Topics include the creation of racial and ethnic identities, the nature and extent of segregation, education, employment, and wealth inequalities, and the effects of state policy. The course emphasizes both theoretical and empirical assessments. Prereq: SOC 520 or SOC 645, juniors and seniors only. 4 cr.

754. Sociology of Religion
Focuses on the diversity of lived religion in contemporary society. Using a life-course perspective, this course focuses on family relationship and social role transitions in later life. Addresses the impact of the empty-nest stage, grandparenting, retirement, care giving, and widowhood on the well-being and relationships of older people. Juniors and seniors only. 4 cr.

760. Aging and Late Life Family
Using a life-course perspective, this course focuses on family relationships and social role transitions in later life. Examines the impact of the empty-nest stage, grandparenting, retirement, care giving, and widowhood on the well-being and relationships of older people. Juniors and seniors only. 4 cr.

770. Social Stress and Health
Increases students' understanding of how the social environment affects the health and well-being of individuals. In particular, we examine how stress processes rooted in social structures and institutions help to explain variations in mental health. The conceptualization and measurement of social stress, moderators and mediators in the stress process, and mental health outcomes will also be introduced. 4 cr.

773. Sociology of Childhood
Examines students to a variety of sociological perspectives about childhood in American society. Focuses on the empirical study of childhood, how social institutions, like the modern family, school, economic system, justice system and communications media affect children. Assumes prior understanding of important sociological concepts, critical thinking skills and social science writing ability. Prereq: SOC 520 and permission. Writing intensive. 4 cr.

775. Family Violence Research Seminar
Permission required. 4 cr.

780. Social Conflict
Analysis of the social processes associated with the major forms of conflict management in human societies: discipline, rebellion, vengeance, negotiation, mediation, law, therapy, socialism, and avoidance. Writing intensive. 4 cr.

792. Research Internship
Designed for students who want some practical experience applying social research methods in a program or policy setting. Students meet weekly to discuss their experiences in the internship placement. Students design and carry out research in the placement settings. Placements are arranged by the student and faculty member. Includes community development agencies, social services agencies, nonprofits, research centers and community. The final report on the research undertaken is required. Prereq: SOC 502, 599, 601, permission. 4 cr.

793. Internship
Provides upper level sociology majors with an opportunity to apply what they have learned in the classroom to the real world. Students meet weekly to discuss assigned readings, internship progress and seminar project. Project ideas are developed with faculty and internship site supervisor. Prereq: junior or senior sociology majors. 4 cr.

#794. Evaluation of Social Programs
Evaluation research defined: purposes of evaluation, design of evaluation studies, setting of programs, utilization of evaluation results. Examination of case studies of evaluations of social programs. Students are responsible for designing an evaluation study in their chosen substantive area. Prereq: SOC 601. 4 cr.

797. Special Topics
Occasional or experimental offerings. May be repeated for different topics. Writing intensive. 4 cr.

Spanish (SPAN)
(For program description, see page 42.)

401-402. Elementary Spanish
Conducted in Spanish. For students without previous knowledge of Spanish. Aural/oral practice, fundamental speech patterns, reading and writing to achieve a firm basis for an active command of Spanish. Lab. No credit toward a major. (No credit for students who have had two or more years of Spanish in secondary school; however, any such students whose studies of Spanish have been interrupted for a significant period of time should consult the chair about possibly receiving credit.) 401-402 taken together satisfies the foreign language requirement. Special fee. 4 cr.

410. Communicative Spanish for the Professions
A skill-based course for students at the advanced beginner/low intermediate level who wish to focus on the Spanish language for use in relation to the health fields, business, law, tourism, and social services. Helps students develop a practical understanding of the Hispanic world through communicative activities in specific fields. 2 cr.

500. Selected Topics in World Literature
Topics chosen that introduce students to major themes and genres. (Also offered as CLAS 500, FREN 500, GERM 500, ITAL 500, PORT 500, RUSS 500.) May be repeated for credit. Writing intensive. 4 cr.
503/503H. Intermediate Spanish
Conducted in Spanish. Emphasizes the development of reading, writing, speaking, and listening skills. Review of grammar. Discussion and short papers in Spanish based on cultural and literary readings. Films. No credit toward the major. Special fee. Lab. Satisfies the foreign language requirement. 4 cr.

504/504H. Intermediate Spanish
See description for SPAN 503. 4 cr.

#522. Latin American and Brazilian Literature in Translation
Major works by principal authors such as Inca Garcilaso, Díaz del Castillo, Machado de Assis, Borges, Asturias, Neruda, E. Verissimo, Fuentes, Lefebre, Guimarães Rosa, and Jorge Amado. Readings, discussion, papers in English. Does not count toward Spanish major. May be repeated. Special fee. Writing intensive. 4 cr.

525/525H. Spanish Civilization and Culture
Historical, geographical, and artistic expressions of Spanish civilization that have formed the character of contemporary Spanish culture. Readings, slides, films, tapes, and records. Conducted in English. Majors must take either 525 or 526, but both may not be counted for major credit. Special fee. 4 cr.

526/526H. Latin American Civilization and Culture
Significant historical, geographical, and artistic expressions of pre-Colombian and Latin American civilization. Readings, slides, films, tapes, records. Conducted in English. Majors must take either 525 or 526, but both may not be counted for major credit. Special fee. 4 cr.

595. Practicum
Practical use of Spanish language or cultural skills outside the classroom through special projects. Prereq: SPAN 504. 2 cr.

601. Spanish Phonetics
Practical application of fundamental phonetic theory to spoken Spanish. Required of Spanish majors. Special fee. 4 cr.

631/631H, 632/632H. Advanced Conversation and Composition
To maintain and perfect written and spoken Spanish through intensive classroom work, individual conferences, and laboratory sessions. Discussion and frequent papers in Spanish based on cultural and literary readings, audiotapes, and video. Prereq: SPAN 504 or equivalent. Special fee. Writing intensive. Satisfies the foreign language requirement. 4 cr.

645. Intro to Spanish Linguistics
This course is an introduction to Spanish linguistics and establishes the basis for future application of linguistic principles. The course explores different areas of linguistics including morphology, word formation, and word inflection. Issues in syntax and semantics are analyzed both in isolation and in terms of their relationship to each other. Students will be equipped with the skills necessary to apply these linguistic concepts to actual Spanish language data and to achieve a better understanding of the structures governing the language they are studying. Prereq: Span 631 or equivalent. Special fee. 4 cr.

648. Readings in Current Periodicals
Advanced practice in reading, speaking, and writing, based on current events in contemporary periodicals of the Spanish-speaking world. Pre- or Coreq: SPAN 632 or equivalent. Special fee. 2 to 4 cr.

650. Introduction to Critical Analysis
Methods and practice of literary criticism. Critical analysis of representative essays, fiction, poetry, and drama from Spain and Latin America. Frequent short papers. Required of Spanish majors; should be taken concurrently with or immediately following SPAN 632. Special fee. Writing intensive. 4 cr.

651, 652. Introduction to Spanish Literature and Thought
Reading and analysis of major works within the historical, cultural, and social background of the New World. Papers, discussion, and examinations in Spanish. Prereq: SPAN 631, 632. May be taken concurrently with SPAN 632 with permission of adviser. Special fee. Writing intensive. 4 cr.

653, 654. Introduction to Latin American Literature and Thought
Reading and analysis of major works within the historical, cultural, and social background of Latin America. Readings, slides, and examinations in Spanish. Prereq: SPAN 631, 632. May be taken concurrently with SPAN 632 with permission of adviser. Special fee. Writing intensive. 4 cr.

681. Summer Study Abroad in Mexico
Six-week summer immersion program for undergraduate students. (There are two sessions; one for home stay and one for dorm.) Special fee. Cr/F. 8 cr.

685, 686. Study Abroad/Granada
Studies at a Spanish or Latin American university. Prereq: primarily for juniors and seniors who have passed SPAN 503-504 or equivalent with a grade of B (3.00) or better. Noncredit orientation meetings required during semester prior to departure. Interested students should consult with the program directors. Special fee. Cr/F. (An IA [continuous grading] grade will be assigned until official transcript is received from the foreign institution.) 16 cr.

733. History of the Spanish Language
Evolution of the Spanish language from the period of origins to the present. Special fee. 4 cr.

756. Modern Spanish Poetry
Study of selected Spanish poets of the 18th, 19th, and 20th centuries in the context of historical, literary, and social currents of the time. Prereq: SPAN 652, 654, or equivalent. Special fee. Not offered every year. 4 cr.

#757. Spanish Drama of the 20th Century
Study of selected Spanish dramatic works of the 20th century in the context of the historical, literary, and social currents of the times. Prereq: SPAN 652, 654, or equivalent. Special fee. Not offered every year. 4 cr.

#758. Spanish Prose of the 20th Century
Novels, short stories, and essays: Unamuno, Baroja, Menéndez Pidal, Ortega y Gasset, Julián Marías, Aranguren, Pérez de Ayala, Girondel, and Cela; survey of contemporary prose. Prereq: SPAN 652, 654, or equivalent. Special fee. Not offered every year. 4 cr.

771. Latin American Drama
Topic varies from year to year. Examples: 20th-century Latin American drama; Latin American one-act plays; Theater of protest in Latin America. Prereq: SPAN 650, 654, or equivalent. Special fee. (Not offered every year.) 4 cr.

772. Latin American Novel
Development from romanticism to the present; contemporary trends and techniques. Prereq: SPAN 652, 654, or equivalent. Special fee. (Not offered every year.) 4 cr.

#773. Latin American Short Story
Representative authors; stress on 20th century. Principles of interpretation. Prereq: SPAN 652, 654, or equivalent. Special fee. (Not offered every year.) 4 cr.

#774. Major Latin American Authors
Works and lives of selected writers; pertinent historical circumstances. Prereq: SPAN 652, 654, or equivalent. Special fee. (Not offered every year.) 4 cr.

790. Grammatical Structure of Spanish
Overview of the grammatical structure of Spanish through in-depth analysis of both morphology and syntax, with emphasis on the meaningful contrasts within the Spanish language and the grammatical contrasts between Spanish and English. Special fee. 4 cr.

795. Independent Study
Guided individual study with training in bibliography and organization of materials. Topics selected by instructor and student in conference. Barring duplication of content, may be repeated for credit. Prereq: permission of major supervisor. 1 to 4 cr.

795K. Special Studies in Contemporary Latin American Literature
2 cr or 4 cr.

797. Special Studies in Spanish Language and Literature

798. Special Studies in Spanish Language and Literature
A) Historic Minorities of the United States, B) Portuguese, C) Hispanic Film, D) Introduction to Hispanic Linguistics, E) Hispanic Dialectology, F) Other. Specialized courses covering topics not normally presented in regular course offerings. Barring duplication of content, topic F may be repeated for credit. Prereq: permission of major supervisor. Special fee. 4 cr.

799. Senior Honors
For senior Spanish majors with a minimum cumulative grade-point average of 3.20 and the same or better average in the major who want to undertake a special honors project in an area of Spanish language or literature of their choice. Prereq: permission. Special fee. 4 cr.
Technology (TECH)
(For program description, see page 53.)

400. Introduction to CEPS Programs
An overview of programs offered by the College of Engineering and Physical Sciences with an emphasis on skills needed to be successful academically, career opportunities and professional development. Required course of all undeclared majors in CEPS. Cr/F. 1 cr.

The elements of symmetry and its occurrence and role in nature (bilateral symmetry in butterflies and animals; cylindrical symmetry in trees and volcanoes; helical symmetry in shells, proteins, and DNA; the role of symmetry in design of medicines); its role in art and design (textiles, advertising); and in our lives (design of houses, chairs, scissors). The course is non-mathematical and is open to students having little background in science. Writing intensive. 4 cr.

564. Fundamentals of CAD
Fundamentals of CAD and computer-based graphics, including using CAD as a design tool to create engineering drawings. AutoCAD and SoftDesk Civil software used to cover the following topics: drawing file storage and retrieval, display functions, basic drawing and editing commands, symbol libraries, plotting drawings on paper, and using parametric design features in the CAD system. Basic DOS familiarity is assumed. Prereq: civil engineering majors only. Special fee. Lab. 3 cr.

583/583H. Technology: Cultural Aspects
Study of the requirements, limitations, benefits, and hazards that are constraints on the development of technological systems. Prereq: prior courses in physics or chemistry at high school level; sophomore or higher standing at UNH; not open to CHE, CIE, EE, or ME majors; permission. 4 cr.

601. Fundamentals Examination Review Course
A ten-week review course for those interested in taking the fundamentals examination to be certified as an engineering-in-training (EIT). Cr/F. 1 cr.

685. Budapest Program
Enables students to pursue a semester of study at the Technical University of Budapest. For information, contact the Dean's Office, College of Engineering and Physical Sciences. Prereq: CEPS students only. Special fee. Cr/F. 20 cr.

696. Independent Study
Open to all qualified students pursuing studies that do not fall within existing departmental areas. Special fee when the topic is chemistry for engineers. 1 to 4 cr.

797. Undergraduate Ocean Research Project
Students work as members of interdisciplinary project teams on contemporary ocean-related problems under the guidance of a faculty adviser. Student team defines problem, prepares a budget, conducts literature surveys, engages in dialogue with experts in the community, deals with vendors, designs, and builds a working engineering model, gathers analyzes scientific data or conducts a comprehensive study, makes interim reports, and defends the results before a jury of experts. Prereq: normally senior standing and permission of the program director. A yearlong effort: 2 credits each semester, 4 credits total, an IA (continuous course) grade given at the end of the first semester. Writing intensive. 2 cr.

Theatre & Dance (THDA)
(For program description, see page 48.)

435. Introduction to Theatre
Introduces all aspects of theatrical production: play writing, acting, directing, design, technical theatre and construction, and theatre management. Cultural and social context of theatre in our time and through the ages. Introduces major classical and modern types of theatre. Selected plays are read and discussed, and attendance at theatrical productions is required. Special fee. 4 cr.

436/436H. History of Theatre I
The history of theatre and its drama is introduced through close study of the world's greatest plays from the Greeks through the end of the 17th century; how these plays were performed then, how they are performed now, their political, social, and cultural urgencies. 4 cr.

438/438H. History of Theatre II
The history of theatre and its drama is introduced through close study of the world's greatest plays of the 19th, 20th, and 21st centuries; how these plays were performed then, how they are performed now, their political, social and cultural urgencies. 4 cr.

442. Introduction to the Art of Acting
Designed for non-THDA major students interested in the art of acting. Students broaden and deepen their own creativity, gain a deeper understanding of human behavior and interaction, and strengthen analytical skills through class work and projects. Focusses on the basic skills of acting: the ability to effectively communicate, to gain access to the full spectrum of human emotions, and increase spontaneity. Important innovators and theorists in the field of theatre and acting are covered, such as Sanford Meisner, Constantine Stanislavski, Bertolt Brecht, Jerzy Grotowsky, Agusto Boal, and Jacques Lacoq. Additional topics include contemporary plays and playwrights, an historical perspective of the art of acting, and the current state of live theatrical performance. 4 cr.

450. History of Musical Theatre in America
Study of the development of the musical and its relationship to American social history. Special fee. 4 cr.

458. Costume Construction
Study and development of costuming techniques, including hand and machine sewing, pattern drafting, alterations, and fabric manipulation. Emphasis on demonstrated understanding. Special fee. 4 cr.

459. Stagecraft
Elements of play production: basic building components, tools, and materials for producing the scenery; equipment and shop layouts supporting all of the areas of the set, lighting, and costume designs; and consideration of various stage spaces and theatrical venues. Practical application on University theatre productions. Special fee. Lab. 4 cr.

461. Modern Dance I
Introductory course that includes techniques and improvisation as well as lectures in history and theory. (Also listed as KIN 604.) 4 cr.

462. Ballet I
Introductory course: technique, historical development of ballet. Students who have had several years of ballet are expected to register for THDA 562 or 662. Instructor determines appropriate level. Not open to seniors. 4 cr.

463. Theatre Dance I
Introductory course: techniques; improvisation; lectures on jazz, ethnic, and other theatrical dance forms. Students with prior experience are expected to register for THDA 563 or 663. Instructor determines appropriate level. Not open to seniors. Special fee. 4 cr.

470. Movement and Vocal Production
Expansion of the student's vocal and physical/kinesthetic awareness, utilizing basic theories and lessons of Lessac, Laban, and Alexander. Text exploration is supplemented with exercises from Berry. Permission required. 4 cr.

475. Stage Makeup
Fundamentals of juvenile, old age, character, and special stage makeup techniques. Special fee. 2 cr.

487. Dance
Historical and philosophical consideration of dance trends. Not a performance course. 4 cr.

520. Creative Drama
Drama techniques leading to the design and execution of drama sessions with children. Includes role-playing, improvisation, and story dramatization. Lab. 4 cr.

532. London Experience
Exploration of the culture and history of London while enhancing study of live theatre prior to active study in the country. May be repeated to a maximum of 4 credits. Special fee. IA (continuous grading). 2 cr.

541. Art and Theatre Administration
Administration practices applied to arts, music, and theatre management. Fund raising, public relations, business and box office management, audience development and long range planning. 4 cr.

546. Costume Design for the Theatre
How to design costumes for the theatre, not figure drawing, although drawing techniques are taught. Script analysis and research and presentation techniques for costume design explored and implemented. Special fee. 4 cr.

547. Stage Properties
Research and manufacture of period and modern stage, trim, and hand properties. Prereq: THDA 459. Special fee. 4 cr.

548. Stage Lighting Design and Execution
Script analysis, the light plot, and instrument schedule, including cue-writing, color, instrument, and the mechanics of developing a functional design. Special fee. 4 cr.

550. Actor's Voice Through Text
Continuing development of the actor's techniques for creating increased vocal expressiveness. Addresses the methods of varying vocal style and presentation through in-depth analysis and interpretation of the text. Prereq: THDA 470. 4 cr.

551. Acting I
Development of fundamental vocal and physical stage techniques for actors and directors through exercises, improvisation and theatre games. Special fee. 4 cr.

552. Acting II
Focuses on strengthening the actor's ability to achieve a higher level of truth, presence, and spontaneity on stage. Building on the approach devised by Sanford Meisner, this highly intensive class creates a bridge to connect these developing skills to various forms of text. Prereq: THDA 551. Special fee. 4 cr.
555. Exploring Musical Theatre
Introduces musical theatre as an American art form. Discussion and analyses of performing, acting, and staging techniques. Permission required. Lab. Special fee. 4 cr.

562. Ballet II
Extension of ballet I syllabus; emphasis is on technique, with additional step vocabulary. May be repeated once for credit. Prereq: THDA 462 or permission. 2 cr.

563. Theatre Dance II
Technique: African-Cuban, modern, and East Indian dance; body movement through exercise and combinations involving stretch, strength, and flexibility. May be repeated for credit. Prereq: THDA 463 or permission. Special fee. 2 cr.

576. Pointe
Intermediate course in the art of dancing on pointe. Focus on technique involved in gaining strength and on methodology for understanding the art of the ballerina. 2 cr.

583. Introduction to Puppetry
Introduces the art of puppetry for general appreciation, entertainment, application in the classroom, and as a therapeutic tool. Emphasis on constructing a variety of puppets (e.g., hand, rod, shadow, and scarf) and adapting literary sources for scripts and performance. (Not open to seniors.) Special fee. 4 cr.

586. Dance Pedagogy
Introduces the art and science of teaching the movement forms of ballet, modern, jazz, and tap. Provides a general background into the nature of teaching, standards that make up good teaching, and methods of teaching dance that allow for technical proficiency to develop. Students focus on pedagogic approaches to learning their art and craft. 4 cr.

592A. Special Topics
Special topics, projects in theatre and dance. Content varies according to needs and interests of students and faculty. Course descriptions are available in department office. May be repeated for credit. 1 to 4 cr.

597. Dance Theatre Performance
Designed for students participating in UNH Dance Theatre Company. Skill development through rehearsal and actual performance experience. May be repeated for credit. 2 cr.

622. Storytelling, Story Theatre, and Involvement Dramatics
Students actively develop storytelling techniques based on individual needs. Includes an examination of story theatre and involvement styles and the development of the ensemble. Special fee. 4 cr.

624A. Theatre for Young Audiences/Acting
Introduces coaching and directing techniques for classical and contemporary acting styles in theatre for young audiences. A brief historical context leads into practical exploration of coaching situations. Students are expected to demonstrate effective acting techniques and to develop teaching strategies for young performers by participating in a culminating performance or project. Prereq: THDA 436 or THDA 438. Special fee. 4 cr.

632. Interpretation of Shakespeare in Theatre
Increases understanding of Shakespeare's language and action, and improves ability to speak his verse and prose with clarity and verve. Students achieve insights into Shakespeare's plays through the medium of performance. Weekly oral and written assignments. Prereq: THDA 551 and THDA 552; or permission of instructor. 4 cr.

633. Dance Composition
Practical, developmental approach to process of creating dances. Prereq: THDA 561; 562; 563; or permission. Special fee. 4 cr.

A survey of American plays from O'Neill onward. Students read and analyze two plays a week. Oral, written, and theatrical assignments. Prereq: one of the following) THDA 436, THDA 438, THDA 450 or permission of the instructor. 4 cr.

641. Stage Management
Introduces to the concepts and skills needed for stage management. Stage managers perform a central role in the theatrical production, coordinating artistic and technical elements. They need a thorough understanding of the script, strong management skills, and a solid background in all aspects of the theatre. Prepares students to function as a stage manager in productions at any theatre. Prereq: (one of the following) THDA 459; 551; 597; 655; or 741. Special fee. 2 cr.

650. Scene Painting for the Theatre
Scene painting analyzed. Techniques and media to create a larger-than-life approach to scale, equipment for conversion, and appropriate stylistic techniques for enlargement reviewed. Employs basic painting techniques and methods of paint application, but scale conversion technique extend the training of easel painters. Prereq: THDA 459. 2 cr.

651. Rendering for the Theatre
Theatrical rendering is a presentational arrangement of given items in perspective appropriate to a set or in a costume at a frozen moment during the production, indicating appropriate mood, atmosphere, and depth. For the theatre, this is generally done in watercolor, but many other media are possible and are explored. Prereq: THDA 459. 2 cr.

652. Scene Design
Scene design from script to finished design. Both aesthetic and practical viewpoints considered. Emphasis on presentational techniques: study of perspective and finished rendering. Prereq: THDA 459. 4 cr.

653A. Performance Project
Application of prior coursework to a formal theatre production or to an individual performance or teaching project. Substantial written work is factored into the final grade. May be repeated. Writing intensive. 2 cr.

653B. Performance Project/Musical Theatre
Application of prior coursework to a formal theatre production or to an individual performance or teaching project related to Musical Theatre. Substantial written work is factored into the final grade. May be repeated. Special fee. Writing intensive. 2 cr.

654. Scenic Arts Project
Application of prior coursework to a formal theatre production or to an individual performance or teaching project. Substantial written work is factored into the final grade. May be repeated. Writing intensive. 2 cr.

655. Musical Theatre Styles
Gives an increased understanding of performing and directing techniques as they apply to musical theatre. Students gain knowledge of various writers, and historical periods, and apply their knowledge to a variety of performance styles. Focuses on the discussion and application of auditioning, acting, and staging techniques. Special fee. Lab. Permission required. Writing intensive. 4 cr.

656. Musical Theatre Repertoire and Audition
Students read and analyze selected texts and scores from the 20th Century Musical Theatre and use their combined readings and research to develop audition repertoire materials. Class participants are expected to demonstrate an understanding of subject matter through shared oral presentations and written work throughout the term. Prereq: THDA 655 or permission. Special fee. 4 cr.

657. Play Reading
A high-volume reading course that introduces a breadth of dramatic literature from ancient times to the present. Reading lists vary according to interests and needs of students. Students read and analyze three plays/week. 4 cr.

662. Ballet III
Advanced-level course in technique; pointe work included. May be repeated for credit. Prereq: THDA 562 or permission. 2 cr.

663. Theatre Dance III
Extension of Theatre Dance I and II; brings students to a more advanced technical level. May be repeated for credit. Prereq: THDA 662 or 663. Permission required. 2 cr.

665. Aerial Dance
The study of aerial arts including two and one point trapeze and fabric. May be repeated for credit. Prereq: THDA 662 or 663. Permission required. Special fee. 4 cr.

670. Dialects
Study and practice in basic dialect acquisition for performers. Prereq: THDA 470, 551. Permission required. Special fee. 4 cr.

683. Advanced Puppetry
In-depth study of the theory and practice of puppetry for the advanced student. Students develop skills in manipulation and construction of selected puppet forms and apply these skills in performance. Examines historical perspectives and the application of puppetry in the classroom and as a therapeutic tool. Prereq: THDA 583 or permission. 4 cr.

684. Special Topics
Exploration of topics agreed upon by students and instructor. Topics vary. May be repeated. 2 to 4 cr.

689. Practicum
The practicum ensures a breadth of experience in the major. Students should register for a different topic each semester during the sophomore and junior years. A) technical, B) costumes, C) performance, D) management. May be repeated for up to 6 credits. Cr/F. 1 cr.

691. Internship
Fieldwork with a regional or touring theatre. This advanced level internship allows the student to experience a professional theatre setting prior to graduation. Normally supervised by a qualified theatre professional, with frequent consultation
with a faculty sponsor. A written report is required. May be part- or full-time with credits assigned accordingly. Permission required. Students must also register for a graded 4-credit independent study. May be repeated up to a maximum of 8 credits. Cr/F. 2 to 8 cr.

721. Education through Dramatization
An advanced course that is paired with Methods of Teaching Theatre. Provides in-depth study and practice of integrated arts lessons in K-12 school curricula. Prereq: THDA 520. Special fee. Writing intensive. 4 cr.

727. Methods of Teaching Theatre
The capstone of the theatre education major’s studies. Designed for students who are preparing to enter student teaching. Provides practical information, skills, and lesson plans that theatre teachers use as source material for the secondary classroom. Covers a wide range of teaching models. Students define and articulate a personal teaching philosophy, write comprehensive semester curricula and course syllabi, and create an extracurricular program plan and philosophy. Prereq: THDA 520. Special fee. Writing intensive. 2 to 4 cr.

729. Community Oriented Drama Programs
Advanced practicum in designing, developing, and producing drama programs for the school and community. Includes audience analysis and marketing skills as well as adapting spaces, soliciting volunteers, and working with a limited budget. May be repeated to a maximum of 4 credits. 1 to 4 cr.

732. Choreography
Theoretical and practical consideration of the creative and aesthetic aspects of ballet, modern, and theatre dance. Prereq: THDA 633. Special fee. 4 cr.

741. Directing
A process oriented approach to the art of stage directing. The course begins with an in-depth focus on script analysis. Students then develop their skills as the "master storyteller" through imagination, interpretation, communication, and style. Prereq: THDA 551 and THDA 552. Special fee. 4 cr.

742. Directing II
In-depth study of the theory and practice of stage direction for the advanced student. Builds on 741, Directing. Students strengthen and expand their existing knowledge of the subject area. Exploration focuses on three areas of directorial communication: application to periods and styles, exploration of avant-garde theory, and directorial technique. Concludes with a major project mounted for public performance. Prereq: THDA 741. Special fee. 4 cr.

750. Writing for Performance
A high-volume reading course which introduces a sampling of American female playwrights starting with the 20th century. Focus is on the evolution of female theatre artists and how roles of women are portrayed in various dramatic works. Reading lists may vary according to the interests and needs of students. Students read and analyze two to three plays/week. Prereq: THDA 436, 438, 450 or a History Gen. Ed., or permission of instructor. 4 cr.

758. Acting III
Applies the principles and techniques acquired by students in THDA 551 and THDA 552 to various genres, such as epic and absurdist, and to mediums such as television and film. Special attention is given to characterization beyond the student’s standard range and the development of the actor as a creative artist, using techniques of such methodologists as LaCoc, Laban, and Grotowski. Prereq: THDA 551 and THDA 552. Special fee. 4 cr.

759. Acting: Period and Style
Techniques of style analysis and period research. For the first time in the students’ undergraduate actor training, students synthesize their basic actor training with the heightened language and archetypal characterization inherent in the classical theatre of the ancient Greeks, the Commedia dell’Arte, the Renaissance, the Neoclassical period, and the Restoration period. Prereq: THDA 470, 551, 552; one semester of THDA 436 or THDA 438, or permission. 4 cr.

760. History and Play: Analysis for Teachers
Focuses on how to teach the areas of history, play analysis, and playwriting to high school students. Lesson plan writing, an integral part of the class, explores different methods of introducing theatre history and play analysis in secondary education classrooms. Includes playwriting through original scripting as well as writing adaptations. Prereq: THDA 436 or THDA 438. 4 cr.

762. Women in 20th and 21st Century American Theatre
A high-volume reading course which introduces a sampling of American female playwrights starting with the 20th century. Focus is on the evolution of female theatre artists and how roles of women are portrayed in various dramatic works. Reading lists may vary according to the interests and needs of students. Students read and analyze two to three plays/week. Prereq: THDA 436, 438, 450 or a History Gen. Ed., or permission of instructor. 4 cr.

778. Short Courses for Teachers and Directors
Each of these intensive short courses for elementary, middle, and high school teachers focuses on expanding production skills and methods of implementing theatre and dance techniques in the classroom. Topics may include puppetry, storytelling, play production for the elementary and middle school teacher; makeup; performing the musical with elementary and middle school students; play production for middle school and high school teacher; basic choreography for the school musical; script adaptation; the use of drama to enhance reading and writing; set and lighting design; and design and construction techniques; teaching/directing Shakespeare; theatre pedagogy/advanced methods of teaching theatre; analysis and research; putting arts in the classroom; and integrated arts. Continuing education and professional development is also available for graduate education credit. (Also offered as EDUC 998.) Special fee. May be repeated. 3 or 4 cr.

795. Independent Study
Advanced individual study. Specific independent study opportunities are sometimes posted in the Theatre and Dance Department Office. Project, which includes a substantial piece of writing, must be developed with supervising instructor. May be repeated. Writing intensive. 1 to 8 cr.

796. Independent Study
See description for THDA 795. Writing intensive. 1 to 8 cr.

798. Senior Thesis
Supervised research leading to the presentation of a major research paper. Prereq: permission, majors only, senior standing. Writing intensive. 2 cr.

798H. Honors Senior Thesis
Supervised research leading to the presentation of a major research paper; the resulting paper is defended in an oral presentation before department faculty. Required for graduation from the honors program in Theatre and Dance. Prereq: permission, majors only, and senior standing. Writing intensive. 4 cr.

799. Capstone Project
This required course incorporates and tests the knowledge that majors have learned over their careers in the Department of Theatre and Dance. Capstone experiences are tailored to each student through conference with their adviser in their specific Theatre and Dance track. Writing intensive. 2 or 4 cr.

Tourism Planning & Development (TOUR)
(For program description, see page 98.)

400. Introduction to Tourism
Provides an informational foundation in tourism and gives a more extensive knowledge of the tourism industry. Examines historical perspectives, tourism organization, and supply and demand of the tourism industry. Discusses the dynamic and pluralistic nature of the tourism industry. Writing intensive. 4 cr.

510. Tourism and Global Understanding
Introduces ways in which tourism can act as a vehicle to understanding foreign cultures. Responsible tourism, has the potential to help bridge cultural and psychological distances that separate people of different races, religions, and socio-economic classes. Through responsible tourism we can learn to appreciate, trust, and respect the human diversity that our world has to offer. Helps students gain an informed acquaintance with other cultures and customs, and to understand the central role of tourism in international and cross-cultural understanding. Cr/F option. 4 cr.

#550. Tourist Characteristics and Behavior
Study of the socioeconomic, demographic, and psychographic characteristics of various types of tourist populations; specific emphasis on host-guest relationships and human development. Prereq: TOUR 400. 4 cr.

560. Special Topics
A) Heritage Tourism Planning, B) Rural Tourism Development. Prereq: TOUR 400. May be repeated. 4 cr.
615. Tourism Planning and Development
The planning and development of tourist resources and programs within a geographic region. Planning models are reviewed and analyzed. The relationship among tourists, tourist developments, and the planning of tourist attractions and services is examined. A strategic planning process is applied to the development of a regional tourism plan in New Hampshire. Prereq: TOUR 400. 4 cr.

633. Economics of Travel and Tourism
Provides an understanding of both the microeconomic and macroeconomic aspects of travel and tourism. Using economics as a theory base, the course attempts to identify what is significant or special about travel and tourism compared with other activities. Special attention is given to issues such as resource immobility, capacity constraints, seasonality, and consumers’ inability to experience the product before purchase. Prereq: EREC 411. (Also offered as EREC 633.) 4 cr.

700. Marketing Communications Research: Methodological Foundations
Concepts, tools, and techniques to facilitate accurate product, service, and idea marketing communications. Specific application to tourism and economic/community development initiatives are included. Prereq: Basic statistics course or permission. 4 cr.

705. Ecotourism: Managing for the Environment
Ecotourism embraces both the environment and economy. Provides a comprehensive framework for planning and managing ecotourism in order to both maximize potential benefits and minimize potential costs for people and the environment. Seminar format. Case studies used to assess the role of ecotourism in the sustainable development of natural resources. Prereq: TOUR 400, juniors or seniors only. 4 cr.

767. Social Impact Assessment
Provides a cross-disciplinary perspective on the issues, problems, and methods of Social Impact Assessment (SIA). Provides analytic approach and theoretical framework for the assessment of diverse events, including changes in the natural environment, the local economy, or dominant technology. SIA is required of most U.S. and Canadian federal- and state-sponsored projects that come under the National Environmental Protection Act, as well as all projects funded by international donor agencies. (Juniors and seniors only.) Writing intensive. 4 cr.

792. International Experience
Travel to foreign country for study of a specific topic to be approved by the student's major adviser. Prereq: permission. 1 to 4 cr.

794. Internship
Interns in a full-time, 15-week (600 hours) supervised situation where they have an opportunity to achieve a synthesis, transfer, and application of the academic experience in a setting similar to that associated with professional employment. Prereq: permission. 4 to 12 cr.

798, 798W. Independent Study
Special assignments in readings, investigations, field problems. May include teaching experience. Prereq: permission. 1 to 4 cr. 798W is writing intensive.

Women’s Studies (WS)
(For program description, see page 52.)

401/401H. Introduction to Women’s Studies
Interdisciplinary survey of the major areas of women’s studies: women’s history, cross-cultural perspectives, women in literature, psychology of women, etc. Basic principles and concepts fundamental to more advanced women’s studies research. Topics vary. Required for major and minor. Writing intensive. 4 cr.

444. Constructing Gender Identity and Expression in Everyday Life
Using a social construction approach, students explore the multiple ways in which gender is constructed within the lives of children, women, men, and transgender people. Specific attention focuses on the social institutions and systems that encourage both the construction and reproduction of gender identity and expression across the lifespan. Students actively participate in identifying historical and current day factors and institutions that shape gender. Students explore the roles of families, schools, educational settings, media, the workplace, recreation activities, the medical system, religion, laws, and the laws and the legal system in the construction of gender. 4 cr.

595/595W. Special Topics
In-depth study of topics not covered in regular course offerings. Prereq: permission; WS 401. 1 to 4 cr. 595W is writing intensive.

632. Feminist Thought
Theories of women’s oppression and emancipation explored from various historical, political, cultural, and social perspectives. A major goal of the course is to increase awareness of historical and contemporary feminist approaches to understanding women’s experiences, representations, and relative positions in societies. The course also considers the interrelation of theory and practice and the impact of past feminist theories on feminist movements. Prereq: WS 401. Writing intensive. 4 cr.

795. Independent Study
For advanced students who have the preparation to carry out an individual project of supervised research on a specific women’s studies topic. Preparation should include WS 401 or equivalent, and/or other women’s studies courses. Barring duplication of topic, may be repeated for a maximum of 8 credits. Prereq: permission of instructor and women’s studies coordinator. 1 to 4 cr.

796. Advanced Topics
Advanced or specialized topics not normally covered in regular course offerings. May be repeated, but not in duplicate areas. Prereq: permission. 1 to 4 cr.

797. Internship
Students gain practical experience in a woman-focused agency or organization. Plan of study and requirements are developed together with a faculty adviser and the student’s workplace adviser. Bi-monthly seminar with all internship students and instructor. Prereq: permission. WS majors or minors. May be repeated. 4 cr.

798. Colloquium
Intensive study of specialized topic for advanced students. Topics vary with instructor. Prereq: permission. Required for WS minors. Barring duplication of topic, may be repeated for credit. Writing intensive. 4 cr.

799. Honors Thesis
With a faculty sponsor, students enrolled in the honors-in-major program develop an independent, investigative project in women’s studies. Written thesis. Prereq: majors only; one other WS 700-level course prior to or concurrently with WS 799; permission. 4 to 8 cr.

Zoology (ZOOL)
(For program description, see page 100.)

400. Professional Perspectives in Zoology
Presentations by departmental faculty provide an informal overview of various zoological topics and professional opportunities. The course acquaints students with faculty, provides information on departmental research projects, and facilitates early research involvement for students. Required for all first-year zoology majors. (Fall only.) Cr/F. 1 cr.

401. Human Biology
Elementary study of structure, function, and development of all systems of the body. No credit toward major or minor. Cannot be taken for credit after ZOOL 507-508. Special fee. Lab. 4 cr.

408. Ocean Sciences
Ocean sciences is a hands-on, inquiry-based introduction to marine systems, focused primarily on marine biology and ecology. Designed to introduce students to science as a way of knowing and understanding the world around us, specifically the world’s oceans and their contributions to world food and oxygen supply, their role in regulating climate, and their unfortunate overexploitation for our technological world. Uses evolution as the unity common to many seemingly different forms of life. Helps students discover the relevance of the topic to their own lives and to the many problems that face us in the 21st century. Engages students by helping them discover first-hand the joy and excitement that comes from making discoveries using the scientific method. Prereq: acceptance to Campus-to-Coast Fellowship Program. 4 cr.

410. Marine Immersion
An intensive 2-credit course for incoming freshmen, surveying a range of marine-related fields (with an emphasis on biology and ecology), research approaches, and organisms. The course is based at the Shoals Marine Laboratory on Appledore Island, where students and some faculty will be in residence. Introduces students to the breadth, excitement, and challenges of marine sciences through lectures, demonstrations, and field experiences offered by a cohort of UNH faculty, and through short research projects carried out on the island. It also introduces them to resources and opportunities available at UNH, provides an opportunity to get to know some of their professors, and lets them begin building a network among their peers even before they arrive in Durham. Special fee. 2 cr.

412. Biology of Animals
Fundamentals of modern animal biology from cells to organisms, including structure, function, genetics, development, ecology, and the diversity produced by animal evolution. Weekly demonstrations and virtual e-labs provide a hands-on introduction to the animal kingdom. Special fee. Lab. (Fall semester only.) 4 cr.
415. Biomechanics
Introduces the physical workings and properties of organisms and their environments. Basic physical concepts of forces, fluid mechanics, scaling, and materials properties are introduced in the context of organismal behavior and morphology. General topics include the physical properties of fluid environments, animal locomotion, the mechanical significance of size, and the structure and function of biomaterials. Special topics relating to current research in the field. Emphasizes using physical concepts to gain insight into organismal functions, adaptations, and habitats. 4 cr.

444. Dogs to Dragons: Origins of Species
A freshman "inquiry" seminar introducing fundamental evolutionary concepts and mechanisms, as well as examining the nature of science, and the ways in which scientists use imagination and inference to better understand the natural world. Through evolutionary case studies ranging from the very real to the purely imaginary, students learn to compare and assess explanatory hypotheses, and to use creative, scientifically-disciplined inference working scientists do. They also develop their abilities to decide what is or isn't science, and to judge the relevance and adequacy of evidence claimed to support hypotheses. The course begins by introducing the mechanism of natural selection through the engaging example of dog domestication, move from there to broader discussions of speciation (including species definitions, and case studies of speciation in progress). The central portion of the course focuses on issues of definitions (what is a "hypothesis" anyway?), and developing increasingly sophisticated and well-informed judgments about different sorts of biological information. In the final section, we explore proper and improper roles of imagination and creativity in science: how (and why) real scientists use fictional species, and how to tell the difference between fictions and frauds while leaving room for humor and invention. Writing intensive. 4 cr.

444A. Introduction to Aquatic Invasive Species
This is an inquiry course for first-year students interested in issues relating to the management of aquatic invasive plants and animals based on an understanding of the ecology and biology. Course is a combination of lectures, laboratory and field exercises and discussions focusing on the selected freshwater and marine invasive species and their management. Special fee. 4 cr.

460. Biological Illustration
Scientific publishing and illustration including labeling, color techniques, and printing processes. Illustration techniques include 1) pen and ink: wildlife illustrations; 2) carbon dust: half-tone illustrations; 3) colored pencil: drafting film; 4) watercolor: for accurate and detailed illustrations. The student may choose to explore a single technique in-depth with subjects selected from a wide variety of material on Appledore Island. Course size is limited to allow individual attention. (Summers only at Shools Marine Lab.) 2 cr.

474. Introduction to Marine Science
Allows non-biology majors to experience the breadth of the marine sciences under field conditions at an island (Appledore) laboratory, with excursions to seal and seabird colonies on the neighboring islands and whale feeding grounds in the Gulf of Maine. Involves field investigation, lab work, and lectures as well as reading, independent research, and scientific writing. Topics include general marine biology, intertidal ecology, plankton biology, fisheries, and benthic (sea floor) communities. (Summers only at Shools Marine Lab.) 4 cr.

503. Introduction to Marine Biology
Organization of marine biological communities in various marine environments—pelagic, benthic, temperate, tropical. Major emphasis on the approaches (e.g., analysis of energy flow and predator-prey interactions) used to analyze marine communities and on the sampling techniques employed for each approach and the habitat type. Prereq: BIOL 411-412. (Also offered as PBIO 503.) Special fee. Lab. 4 cr.

507, 508. Human Anatomy and Physiology
Cellular and systematic aspects of the human body. Laboratory exercises utilize preserved specimens, dissectible models, living tissue and computer-aided instruction. No credit if credit earned for ANSC 511-512 or ZOOL 625. Not offered for credit to zoology majors. Lab. Special fee. 4 cr.

510. Field Ornithology
Introduces field ornithology focusing on the biology, ecology, and behavior of birds on the islands of the Shoals. Includes such ornithological field methods as censuring techniques, territory mapping, banding, behavioral observation, and creating a field notebook. Fieldwork is designed to supplement many classroom concepts, including territoriality, breeding biology, and survivorship. Prereq: one year of college-level biology. Lab. (Summers only at Shools Marine Lab.) 4 cr.

518. Vertebrate Morphology
Evolutionary and comparative examination of vertebrate anatomy. Covers the structure of the major systems at both the macroscopic and microscopic levels. Prereq: BIOL 411-412 or equivalent. Special fee. Lab. 5 cr.

529. Developmental Biology
Introduces developmental biology, examining basic developmental mechanisms and their evolutionary contexts. Principles and tools of the trade, overview of major developmental events in various phyla, current areas of research and other special topics. Labs include different ways to observe development (from low- to high-tech), and work with selected live material. Prereq: BIOL 411-412 or equivalent. No credit if credit earned for ZOOL 729. Special fee. Lab. 4 cr.

542. Ornithology
Identification and biology of birds, especially those of northeastern United States. Involves field trips, laboratory work, and lectures. Prereq: one semester of biology. (Spring semester only). 4 cr.

545. Tropical Ecology
Study of the factors affecting distribution and abundance of organisms of coral reefs, mangroves, and tropical dry and moist forest. Course conducted over winter break in the Virgin Islands National Park, St. John, USVI. $250.00 deposit required at registration. Program fee. Prereq: one biology course. Permission required. Writing intensive. 4 cr.

570. Coastal Ecology and Bioclimates
Practically-oriented. Emphasizes 1) the definition, description and measurement of major abiotic factors (e.g., radiation, temperature, atmospheric moisture and precipitation, and winds and currents); 2) the role of both biotic and abiotic coastal environmental factors with respect to plants and animals, including humans; and 3) the fundamentals of dynamic meteorology and short-term weather prediction from observations of natural coastal phenomena such as cloud and wind patterns. Special attention is given to the terrestrial and littoral microclimate of Appledore Island. Prereq: one year of college-level biology; some physics or physical geography preferred. (Summers only at Shools Marine Lab.) 4 cr.

600/600W. Field Experience
A supervised experience providing the opportunity to apply academic experience in settings associated with future professional employment and/or related graduate opportunities. Must be approved by a faculty adviser selected by the student. May be repeated to a maximum of 8 credit hours. Prereq: permission. Cr/F. 1 to 4 cr. 600W is writing intensive.

610. Principles of Aquaculture
Introduces the culture practices employed for production of aquatic organisms. Topics include ecological and environmental considerations, selective breeding, nutrition, diseases, processing, and marketing. Emphasis on finfish. Prereq: BIOL 411-412 or equivalent. 3 cr.

611. Principles of Aquaculture Lab
Laboratory exercises in aquaculture covering the use of chemical reagents to monitor water quality; brood stock feeding and management; use of anesthesia and fish handling; spawning marine finfish; culturing algae, rotifers and artemia for marine larviculture; larviculture of marine finfish; assessing fish growth; hatchery hygiene. Includes site visits to local production facilities. Prereq: BIOL 411-412 or equivalent. Coreq: ZOOL 610. 2 cr.

625. Principles of Animal Physiology
Introduces the principles of animal function. The major systems (digestion, metabolism, respiration, circulation, osmotic and ionic regulation, nervous, muscle function, endocrine control) are covered with emphasis on functional mechanisms at the cell and tissue levels. Prereq: two years of the biology core curriculum. 3 cr.

626. Animal Physiology Laboratory
Basic principles of the measurement of function in animals, data analysis and expression, and the development of scientific communication skills. Coreq: ZOOL 625. Special fee. Writing intensive. 2 cr.

628. Marine Invertebrate Evolution and Ecology
Stresses the rich diversity of marine invertebrates by integrating phylogenetic trends with physiological and behavioral adaptation, and with ecological and symbiotic interactions. Offers a comparative survey of invertebrates from protozoans to protostomes; deals with aspects of form and function, development, evolution, classification, ecology, and natural history. Students work with live and preserved animals. Extensive dissections and a field component are required. Prereq: BIOL 411-412. Special fee. Lab. (Not offered every year) 5 cr.

665. Conservation Genetics
Conservation genetics is the application of genetics to preserve species. Emphasizes three important entities capable of coping with environmental change. Includes genetic management of small populations, resolution of taxonomic uncertainties, defining management units within species, and the use of molecular genetic analyses to forensics and the understanding of the biology of species. Topics include methods of measuring genetic diversity in populations, identification of the units of biodiversity to which conservation efforts are directed, genetics of popu-
708. Stream Ecology
Ecological relationships of organisms in flowing water streams as ecosystems. Lectures on physical and chemical features of streams, floral and faunal communities, and factors controlling populations and behavior of stream organisms. Lab exercises employ both field and laboratory experimental techniques. Special fee. Lab. (Not offered every year.) 4 cr.

710. Ichthyology
Introduces the evolution, systematics, anatomy, physiology, and behavior of fishes with emphasis on New England species. Prereq: principles of biology or equivalent. Lab. (Offered in alternate years.) 4 cr.

711. Zooplankton Ecology
Methods of sampling populations, factors regulating temporal and spatial distribution, trophic interactions of communities, role of zooplankton in the food web of lakes. Experimental techniques employed in field trips to freshwater habitats; seminars examine current research. Prereq: general biology. Special fee. Lab. (Not offered every year.) 4 cr.

712. Mammalogy
Evolution, ecology, behavior, physiology, and diversity of mammals. Focuses on conceptual issues such as the relations of structure, function, physiology, and ecology of species; reproductive physiology and life history strategies; and the evolution of mating systems and social structure. Requires familiarity with mammalian groups to the family level and identification of local fauna to species. Prereq: BIOL 411-412 or equivalent. Lab. (Not offered every year.) Special fee. 4 cr.

713. Animal Behavior
Introduces the naturalistic study of animal behavior. Emphasizes the evolution, development, physiology, and ecology of behavior. Topics include the genetic and acquired bases of behavior; neurobiology and behavioral endocrinology; communication, orientation, foraging strategies, reproductive ecology, and the evolution of altruistic behavior. Prereq: BIOL 411-412 or equivalent. Lab. Writing intensive. 4 cr.

714. Ecology of Animal Behavior
An animal's behavioral patterns represent its abilities to deal with the environment dynamically. Course focuses on ecological and evolutionary significance of behavioral patterns found in all organisms, particularly those animals that inhabit coastal marine environments. Strong emphasis on methods of behavioral research and interpretation of behavioral patterns using field observations of diverse fauna of Appledore Island and surrounding waters. Prereq: introductory biology; experience in psychology, animal behavior, or ecology is helpful. (Summers only at Shoals Marine Lab.) 4 cr.

715. Molecular Evolution
Rates and patterns of evolutionary change in bio-molecules; forces affecting the size and structure of genomes; molecular mechanisms of organismal evolution. Emphasizes integrating evidence from biochemistry, molecular genetics, and organismal studies as well as on methods of reconstructing phylogeny from molecular sequences. Prereq: BIOL 604. Some knowledge of statistics is recommended. (Also offered as GEN 715.) Special fee. Lab. (Not offered every year.) 4 cr.

717. Biology of Lakes
Introduces the ecology of freshwater systems, with emphasis on lakes. Origins of lakes and the effects of watersheds on lake chemistry, nutrient cycling, and the lake food web are explored. Other topics include the impact of human disturbances on productivity and aquatic food webs and methods used for the management and restoration of lakes. Comparisons are made of the structure and functions of lake ecosystems found in temperate, tropical, and arctic regions. Prereq: general biology. (Also offered as PBIO 717.) 4 cr.

721. Aquatic Invasive Species
Capstone course for a limited number of biological science majors to work closely with and help teach a Discovery course for non-majors in biology. Involves lectures, discussions, and laboratory field exercises and write-ups focusing on managing aquatic invasive species based on an understanding of their ecology. Special fee. 4 cr.

725. Marine Ecology
Marine environment and its biota, emphasizing intertidal and estuarine habitats. Includes field laboratory, and an independent research project. Prereq: general ecology; permission. Marine invertebrate zoology, oceanography, and statistics are desirable. (Also offered as PBIO 725.) Special fee. (Not offered every year.) 4 cr.

730. Underwater Research
Hypothesis testing and experimental design, theoretical and practical aspects of sampling, and critiques of current research papers. Includes special problems of conducting research underwater (diving physics and physiology, theory and use of diving tables, hyperbaric medicine) and underwater techniques (underwater photography and video, photo quadrats, tagging and marking, cages and enclosures). Students must supply their own equipment. Students with special research interests are encouraged to enroll in an additional third week of independent underwater research. Prereq: recognized scuba certification, a medical examination, one year of biology or other supporting science. (Summers only at Shoals Marine Lab.) 4 cr.

732. Lake Management: A Multidisciplinary Approach
Lectures and seminars on interpreting lake water quality, developing a natural history inventory for lakes, the process of creating a lake management plan, and resolution of conflicting uses of lakes. Students develop actual lake management plans in cooperation with government agencies and lake associations. Guest speakers from state agencies and non-governmental organizations. Introduction to GIS (Geographic Information Systems) methods for the analysis of lakes and watersheds. Present lake management issues from scientific and social science points of view. Open to students from all disciplines. (Also offered as PBIO 732.) Special fee. Lab. 4 cr.
733. Behavioral Ecology
Behavioral adaptations of animals to their environment, including the evolution of behavior and behavioral genetics; foraging and competition for resources; reproductive ecology; mating systems and parental care; and the evolution of cooperative behavior. Examples include both vertebrates and invertebrates. Emphasizes critical understanding of concepts as exhibited in oral and written exercises. Students conduct independent investigations. Prereq: ZOOL 713 or permission. Lab. (Offered in alternate years.) Writing intensive. 4 cr.

734. Diversity of Fishes
Emphasizes the diversity of fishes in two aspects: diversity of evolutionary solutions to problems faced by fishes and the great diversity of different types of fishes that inhabit the world. Prereq: one full year of college level biology; background in vertebrate biology is recommended, but not required. (Summers only at Shoals Marine Lab.) 6 cr.

745. Biology and Diversity of Insects
Study of the biology of insects, the most diverse group of organisms, focusing on why they are unique, how they have become so diverse, and the basis of their success. The laboratory is designed to develop an understanding of insect diversity through utilization of different sampling techniques in several habitats, sorting to "morphospecies," and use of biodiversity indices. Prereq: BIOL 411-412 or equivalent. Special fee. (Not offered every year.) 4 cr.

750. Biological Oceanography
Biological processes of the oceans, including primary and secondary production, trophodynamics, plankton diversity, zooplankton ecology, ecosystems and global ocean dynamics. Field trips on R/V Gulf Challenger and to the Jackson Estuarine Laboratory. Prereq: one year of biology or permission of the instructor. (Also offered as ESCI 750.) Special fee. Lab. (Not offered every year.) 4 cr.

751. Research in Marine Biology
Introduces the adaptations of organisms to marine environments and the role these adaptations have in structuring marine communities using an experimental approach. Emphasizes experimental design, implementation, data analysis, and scientific presentations. Offered in cooperation with Cornell University. Prereq: one year of college-level biology. Additional experience in ecology or physiology is recommended. (Summers only at Shoals Marine Lab.) 6 cr.

753. Marine Vertebrates
Lectures, laboratory work, and fieldwork on the systematics, ecology, and physiology of fishes, marine reptiles, marine birds, and marine mammals of the Gulf of Maine. Offered in cooperation with Cornell University. Prereq: field marine science or vertebrate biology. (Summers only at Shoals Marine Lab.) 6 cr.

772. Fisheries Biology
Principles of fisheries science, with emphasis on techniques used to assess the biological characteristics of exploited fish populations, and the use of such information for fisheries management. Prereq: ZOOL 710 or equivalent; permission. (Not offered every year.) 3 cr.

773. Physiology of Fish
Investigates the physiological processes responsible for maintaining homeostasis in fishes. Focuses on the function and regulation of the major organ systems during stress and environmental adaptation. Topics include reproduction, osmoregulation, digestion, endocrinology, and sensory perception. Prereq: ZOOL 625 or equivalent/or permission. 4 cr.

777. Neurobiology and Behavior
Survey of fundamental concepts and recent discoveries in neurobiology. Topics include structure and function of neurons, development, cellular basis of behavior (sensory and motor systems), neuropharmacology, and neural plasticity (learning). Prereq: BIOL 411-412 or permission. Physiology (ZOOL 625) also desirable. 4 cr.

795/795W. Special Investigations
Independent study in various areas including but not limited to animal behavior, developmental biology, ecology, endocrinology, evolution, ichthyology, genetics, history of biology, invertebrate biology, neurobiology and behavior, protozoology, teaching practices, underwater research, vertebrate biology, and biological techniques. Course sections for advanced work, individual or group seminar. May include reading, laboratory work, organized seminars, and conferences. Prereq: permission of department chairperson and staff concerned. 1 to 4 cr. 795W is writing intensive.

796/796W. Special Investigations
See description for ZOOL 795. 1 to 4 cr. 796W is writing intensive.

799. Honors Senior Thesis
Working under the direction of a faculty sponsor, the student plans and carries out independent research resulting in a written thesis. Limited to students entering their senior year; required for students in the honors program or working toward honors-in-major. Prereq: permission. A two-semester sequence. 2-4 credits each semester; 8 credits maximum. IA (continuous grading) given at the end of the first semester. Writing intensive. 2 to 4 cr.
Program Abbreviations

The number of class hours, laboratory sessions, and credits is shown following each course description. For Example, "2 lec/1 lab/3 cr" signifies that the course has two hours of lecture and one laboratory session scheduled each week, and that it is a three-credit offering; "rec" stands for "recitation."

The abbreviations are used to identify those disciplines offering the coursework.

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<th>Code</th>
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<tr>
<td>AAS</td>
<td>Applied Animal Science</td>
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<td>ABM</td>
<td>Applied Business Management</td>
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<td>ANSC</td>
<td>Animal and Nutritional Science</td>
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<td>CT</td>
<td>Civil Technology</td>
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<td>COM</td>
<td>Communications</td>
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<td>CSL</td>
<td>Community Service and Leadership</td>
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<td>FSM</td>
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<td>FORT</td>
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Agricultural Mechanization (AM)

AM 251. Welding and Fabrication Technology
Processes and procedures of welding including: Shielded Metal Arc Welding (SMAW), Shielded Metal Arc Cutting (SMAC), Oxycetlene Welding (OAW), Oxy-Fuel Gas Cutting (OFCA), Gas Metal Arc Welding (GMAW), Plasma Arc Cutting (PAC), and Gas Tungsten Arc Welding (GTAW). Welding metallurgy and control of distortion. Special fee. Prereq: permission. 2 lec/2-hr rec. 4 cr.

AM 261. Internal Combustion Engines I
Internal combustion engines (spark-ignited and diesel) and their subsystems with emphasis on their design, how they function, preventive maintenance, and troubleshooting. 2 lec/2-hr rec. 4 cr.

AM 262. Internal Combustion Engines II
Advanced engine principles and theory. Detailed major failure analysis and overhaul techniques. Prereq: permission, AM 261 or EDUC 461. 2 lec/2-hr rec. 4 cr.

AM 270. Residential Electricity
Electrical principles, laws, and installation with emphasis on the National Electrical Code. While modeled at the residential level, concepts and terminology will be applicable to the commercial and light industrial sectors as well. Concepts and methodologies will be supported with design and when appropriate, hands-on application to enhance the learning environment. 2 lec/2-hr rec. (Half semester course.) 2 cr.

AM 275. Building Science/Residential Construction
The study of interrelationship of physical principles that affect the functionality and life span of a building. The materials and methodologies of residential construction. 3 lec/2-hr lab. Special fee. 4 cr.

AM 280. Technical Computer Literacy/Internet Applications
An introduction to the concepts, common hardware components, and operating practices of microcomputers. Emphasis on a networked Windows environment, the Internet, hard disk management, Paint Shop Pro, Microsoft Word, PowerPoint, Excel, and Access. 2 lec/2-hr rec. 4 cr.

AM 291, AM 292. Studies in Agricultural Mechanization
Students who have the ability and adequate preparation to work independently may propose a contract to design a course or research project on a topic not available through existing course offerings. The purpose of this research is to explore new areas in the student's field of study or to pursue course material in greater depth. Work is supervised by an appropriate faculty/staff member; credit varies depending on the proposed project/research. Areas may include welding, engines, building construction, electricity, or computers. 1 to 4 cr.

AM 451. Welding and Fabrication Technology
Processes and procedures of welding including: Shielded Metal Arc Welding (SMAW), Oxycetlene Welding (OAW), Oxy-Fuel Gas Cutting (OFCA), Gas Metal Arc Welding (GMAW), Plasma Arc Cutting (PAC), and Gas Tungsten Arc Welding (GTAW). Welding metallurgy and control of distortion. Special fee. Prereq: permission. 2 lec/2-hr rec. 4 cr.

AM 461. Internal Combustion Engines I
Internal combustion engines (spark-ignited and diesel) and their subsystems with emphasis on their design, how they function, preventive maintenance, and troubleshooting. 2 lec/2-hr rec. 4 cr.

AM 462. Internal Combustion Engines II
Advanced engine principles and theory. Detailed major failure analysis and overhaul techniques. Prereq: permission, AM 261, AOE 461, or EDUC 461. 2 lec/2 rec. 4 cr.

AM 470. Residential Electricity
Electrical principles, laws, and installation with emphasis on the National Electrical Code. While modeled at the residential level, concepts and terminology will be applicable to the commercial and light industrial sectors as well. Concepts and methodologies will be supported with design and when appropriate, hands-on application to enhance the learning environment. 2 lec/2-hr rec. (Half semester course.) No credit earned if credit earned for the second half of CT 227. 2 cr.

AM 475. Building Science/Residential Construction
Studies the interrelationship of physical principles that affect the functionality and life span of a building. The materials and methodologies of residential construction. 3 lec/2-hr lab. Special fee. 4 cr.

Applied Animal Science (AAS)

An Internet class delivered through Blackboard Course Management System. Explains and discusses all aspects of animal cruelty, NH cruelty laws, and presents the importance and implications of recognizing animal cruelty and its link to human violence. Cruelty investigation procedures, prosecution protocol and officer field safety will also be presented. Designed as a 14-week class with a "presentation" of one hour per week accessed by the student at their convenience within a specific 3-day time frame during the week. Permission required. 1 cr.

AAS 221. Large Animal Behavior and Handling Techniques
Introduction to domestic large animal behavior and handling techniques. Cattle, horses, swine, and sheep are used in this course. Students perform routine health-related procedures and gain valuable hands-on skills and techniques which can be applied to the fields of veterinary medicine, animal research, commercial agriculture, and animal control. 1 lec/1 lab. 2 cr.

AAS 222. Small Animal Grooming I
Introduction to pet grooming. Covers the techniques and styles of brushing, grooming, clipping, trimming, and bathing common breeds of dogs and cats. Students perform basic grooming in lab period. Special fee for non-TSAS students. 1 lec/1 lab. 2 cr.

AAS 223. Dairy Selection
Selection techniques used in cattle for purchase, breeding, and genetic improvement through the use of visual evaluation, pedigrees, production, and progeny information. 1 lec/1 lab. 2 cr.

AAS 224. Small Animal Management
Organization, care, facilities design, and general management of small businesses dealing with companion animals and their owners. 3 lec/1 lab. 4 cr.

AAS 226. Equine Conformation and Lameness
The study of conformation as it relates to soundness and performance. Topics include basic unsoundness related to faulty conformation and type evaluation. Special fee. 2 lec/1 lab. 4 cr.

AAS 227. Small Animal Diseases
Common diseases in companion animals discussed system by system; emphasis on canine and feline medicine. Prereq: AAS 227, 228, 239, 249. 2 1-hr lec. 2 cr.

AAS 228. Anatomy and Physiology of Domestic Animals
Structure of the body and functions of the tissues, organs, and systems in the living animal. 3 lec/1 lab. 4 cr.
AAS 230. Small Animal Breeds and Behavior
Overview of the development, selection, genetics, and function of specific breeds of companion animals. General dog and cat, as well as breed-specific, behavior is included. 2 lec/1 lab. 4 cr.

AAS 231. Introduction to Animal Science
Survey of the dairy, equine, livestock, and small animal industries; current issues and related occupational opportunities are presented. Included is assistance in gaining or improving the skills needed to be successful in college. Lecture/Lab or Recitation. 4 cr.

AAS 232. Animal Forages
Production and utilization of New England forage crops. Selection of species and varieties; cultural and harvesting practices for top production of excellent quality feed. Combining uses for greatest efficiency in feeding various livestock classes. 2 lec/1 lab. 3 cr.

AAS 233. Small Animal Grooming II
Continuation of AAS 222 Small Animal Grooming I. Student is assigned more complex breeds to groom and develops more proficiency in scissorsing, hand stripping and clipping. Must have taken AAS 222. Special fee for non-TSAS students. 2 lab. 2 cr.

AAS 234. Equipment and Facilities Management
Operation of agricultural equipment and maintenance of agricultural facilities as found in New England. Development of the essential skills and technical information needed to manage and supervise agricultural facilities and equipment. 2 lec/1 lab. 3 cr.

AAS 235. Animal Nutrition
The food nutrients, their digestion and absorption, factors affecting value of feeds, feed additives, and nutrient requirements for maintenance and productive functions. 3 lec. 3 cr.

AAS 236. Equine Show Preparation and Competition
Course addresses the safe handling and appropriate grooming and clipping of horses as they are prepared for competition. Students will demonstrate horse-handling proficiency while showing their assigned horse in hand. Lab. 1 cr.

AAS 237. Equine Handling and Care Techniques
Course familiarizes students with different aspects of equine management through a practical and hands-on approach. Topics include selection, fit and care of English tack, bits, grooming, clipping, wound care, safe bandaging techniques, equine behavior, farm layout, basic health care and monitoring, parasite control, and equine transportation. Students will have hands-on experience in the UNH stable. Responsibilities include feeding, cleaning, turnout, and basic care of the University herd. 4 lec/lab or rec. 4 cr.

AAS 239. Fundamentals of Animal Health
Principles of disease mechanisms: causes, body reactions, and preventive medicine. Prerequisite for other AAS disease courses. Prereq: AAS 228. 2 lec/1 lab. 3 cr.

AAS 240. Animal Breeding
Principles and practices, including the physiology of reproduction, fertility and sterility, artificial insemination, breeding systems, and selection. 2 lec/1 lab. 3 cr.

AAS 242. Introduction to Business: Applied Animal Science
Basic course covering business structure, philosophy, and terminology. Foundation for AAS 246, Management Applications. 2 lec. 2 cr.

AAS 244. Introduction to Dairy Herd Management
The course covers economic, scientific and practical aspects of dairy herd management. The topics covered include history, cattle selection, nutrition, housing, milking, and disease prevention strategies. There are a number of field trips and weekly labs emphasizing management and hands-on experience. (Also offered as ANSC 409/410.) 4 cr.

AAS 246. Animal Business Applications
Survey of the various elements of managing an animal and/or agricultural operation regardless of commodity. Topics include: financial statements, credit and insurance considerations, labor management, marketing, promotions, advertising, and sales. 4 lec. 4 cr.

AAS 247. Applied Equine Management
The application of farm and horse management techniques, including stable routine, planning, and design; nutrition; business considerations; and legal responsibilities. 2 lec/1 lab. 3 cr.

AAS 249. Small Animal Care Techniques
Essential skills and basic background knowledge for the day-to-day care of dogs and cats in a small animal enterprise. 1 lec/1 lab. 2 cr.

AAS 251. Human/Animal Bond
Exploring the many aspects of the human/animal bond through required reading, writing, and discussions. Requires an 8 hour volunteer practicum. 2 cr.

AAS 252. Equine Health Management
Systems of the horse as they relate to common diseases and lameness. Applied approach to conditioning, care of the sick or lame horse, and preventive care. 2 lec/1 lab. 4 cr.

AAS 253. Equine Competition Management
Students organize and run a combined test competition to be held in April. The class is responsible for mailing entries, handling publicity and ad sales, compiling the program, setting the course and dressage ring, and dealing with the public. Proceeds fund seminars available to students and class field trips. 1 lab. 2 cr.

AAS 254. Animal Assisted Activities and Therapy
Course explores the human/animal bond in specifically goal directed activities and therapeutic interventions. Covers human/pet volunteer training; animal selection; animal assisted therapeutic applications; and animals in institutions, residential facilities, and classrooms. The text for the class is provided and covered by the special fee of $25.00. 2 cr.

AAS 263. Small Animal Grooming III
Individual supervised grooming experience for students who wish to obtain more technical grooming skills. Must have taken AAS 222 twice or AAS 222 and 233. Cr/Er. 1 cr.

AAS 264. Dairy Nutrition Practicum
Practical instruction in feeding dairy cattle, formulating rations and using dairy nutrition software. Major emphasis on ruminant digestion, health and metabolism in the high producing dairy cow. Prereq: Introduction to Dairy Management AAS 244 or permission. 1 cr.

AAS 272. Comparative Equine Operations
Survey of regional equine farms and related businesses. Using field trips and journals, students will experience and study different farm and business operations. Prereq: AAS 226. 1 lab. Cr/Er. 1 cr.

AAS 274. Dairy Cattle Disease Seminar
Covers principles of the immune response, immunological basis for disease control, and emphasizes management practices to prevent disease and maintain optimal animal health. Numerous guest lecturers, field and case studies, and emphasis on current topics of interest to the industry. (Also offered as ANSC 630.) 2 cr.

AAS 275. Cooperative for Real Education in Agriculture Management (CREAM)
CREAM (Cooperative for Real Education in Agricultural Management) is a 2-semester course in which students manage a 25-cow dairy herd and make the financial and management decisions associated with the CREAM dairy herd. Assumption of complete responsibility for the management and care of this 25-cow herd for the entire academic year. CREAM provides students with a unique experiential learning model that will help them understand how to work together to manage and operate a small business, the decision making skills required in production agriculture, and the application of science to the management of a dairy herd. Permission. Two semesters of 4 credits each are required. 4 cr.

AAS 276. Introduction to Laboratory Animal Science
Basic introduction to laboratory animal science for second year small animal care students interested in exploring or working in the field. Includes the husbandry, health, and science of common laboratory animal species and environmental, sanitation, hygiene, and safety topics. Prereq: AAS 228, 230, 239, and 249. Coreq: AAS 277. 2 cr. 2 cr.

AAS 277. Laboratory Animal Science Practicum
Hands-on experience working in the UNH laboratory animal facilities. Coreq/Prereq: AAS 276. May be taken twice. 3 to 4 hours per week. 1 cr.

AAS 278. Applied Animal Science Computer Applications
Use of computers in a university setting, developing skills in Microsoft Office, and using the internet. During the second half of the semester, students further develop skills using specific animal science and business-related programs. 1 lec/1 lab/half-term. 1 cr.

AAS 279. Small Animal Care Practicum
Provides supervised, hands-on experience at the N.H.S.P.C.A. 4 hours/week. Responsibilities include cleaning, feeding, treatment, grooming, socializing and training of shelter animals. Student must receive or show proof of pre-exposure rabies prophylaxis to take the class. Prereq: AAS 222, AAS 228, AAS 230, AAS 239, AAS 249. Special fee required only for first time the course is taken 2 cr.

AAS 291, AAS 292. Studies
Students who have the ability and adequate preparation to work independently may propose a contract to design a course or research project on a topic not available through existing course offerings. The purpose of this research is to explore new areas in the student's field of study or to pursue course material in greater depth. Work is supervised by an appropriate faculty/staff member and credit varies depending on the proposed project/research. Areas may include dairy, light horse, beef, swine, poultry, meat, forages, management, small animals, or general animal science. Permission required. Course may be repeated up to a maximum of 6 credits. 1 to 3 cr.
AAS 293. Equine Field Operations
Field experience in selected areas of equine care and handling, under supervision of appropriate faculty/staff and outside facilities supervisor. A) Veterinary Clinic; B) Breeding and Foaling; C) areas of student interest. All field operations done on an individual basis. Four or more hours per week. Students must provide their own transportation. Prereq: AAS 225, 226, 247, and/or permission of instructor and adviser. 1 to 3 cr.

AAS 297. Applied Animal Science Work Experience
Employment (12 weeks, generally in the summer following the first year) in an approved animal-related position. Cr/F.

Applied Business Management (ABM)
(For program description, see page 125.)

ABM 202. Professional Writing
The major focus is on strategies in writing and speaking as related to day-to-day business operations. Applications relate to employees, suppliers, customers, creditors, public officials, and others. 3-hr lec-discussion. 3 cr.

ABM 204. Principles of Management
This first-semester course introduces students to the principles and applications of the full spectrum of management. Topics include: marketing and sales, finance, supervision, production/operations, law, social responsibility and ethics, and international business. Students may develop a long-term career plan and/or business plan as a beginning to their career path. 2 1-hr, 1 2-hr lec-discussion. 4 cr.

ABM 205. Applied Financial Accounting
Learn the basics of sound bookkeeping practices as they apply to any retail, service, or manufacturing entity. Topics include: debiting and crediting, trial balance, worksheets, ledgers and journals, and checkbook reconciliation. Students perform all of the necessary bookkeeping transactions for an actual business. 3-hr lec/2-hr lab. 4 cr.

ABM 206. Human Resource Management
The biggest problem most managers face is getting their employees motivated to work at peak performance. This course is designed to teach managers how to motivate employees through proper hiring techniques, performance reviews, training, administering change, working with problem employees, working with unions, and administering pay and fringe benefits. 2 2-hr discussion. 4 cr.

ABM 207. Applied Marketing
Marketing processes presented through text readings, discussions, and semester-long projects. Topics include market research, target marketing, demographics and psychographics, promotion, advertising and publicity, distribution, and pricing. Focuses on the non-personal aspects of marketing and selling. 4 cr.

ABM 208. Managerial Accounting
Upon successful completion of Applied Financial Accounting (ABM 205), students now focus on the decision-making aspects of financial management, primarily for internal use by managers. Topics include: both short- and long-term considerations in areas such as budgeting, inventory control, capital investments and depreciation, tax strategies, interpretation of financial statements, profitability analysis, cash flow management, standard cost accounting, manufacturing accounting, and other cost accounting techniques. 3-hr lec. 2-hr lab. 4 cr.

ABM 211. Business Policy
Through use of case studies from existing businesses, the organization and execution of a student-run business, and computer simulations of the overall management of a manufacturing facility, students now bring together and apply all they have learned throughout the program. This unique and experiential final-semester course allows the individual to see how all of the parts make up the whole and to achieve a higher level of self-confidence, self-esteem, and hands-on abilities. 2 2-hr lec-discussion. 4 cr.

ABM 212. Business and Industry Internship
Students work and/or complete research projects with business and industry partners under the supervision of faculty; an excellent experiential opportunity. The specific content of each internship will vary tremendously and is unique to each project. Sample focus areas include, but are not limited to, marketing and sales, financial management, personnel management, international trade and operations. Course may be repeated for credit. Cr/F. 1 to 4 cr.

ABM 214. Applied Sales
Focuses on the process of personal selling and persuasion skills. Students spend considerable time practicing their techniques and working with (and observing) professional sales associates in the workplace. Selling involves the pre-approach, approach, demonstration, handling of objections, and closing the sales. Also presents and discusses the roles of the sales manager and related financial elements. 2 2-hr lec-discussion. 4 cr.

ABM 215. Business and the Community
Successful business people must understand the relationship between business and community. The course will explore the role of business and entrepreneurs within the community and the role of the community in developing a successful business environment. An overview of the regulatory environment will be investigated; such as zoning, regulations and other constraints on private decisions. This will be accomplished through lectures, guest lecturers, site visits and a group project. The group project will be a substantial part of the course. This will enable students to apply the principles as well as to experience working in a team environment. 2 2-hr lec. 4 cr.

ABM 217. Web Page Programming and Design
The course focuses on creating and maintaining sites on the World Wide Web. Topics include designing, programming, and promoting individual Web sites, and HTML coding. 2 2-hr lec. 4 cr.

ABM 218. Computer Database Management
Training on the latest database management software. Emphasis on database development and use as a business tool. Major topics include: inventory management, personnel record keeping, managerial decision making, development of queries, reports, labels, and relational database. Special fee. Prereq: ABM majors and permission. 2-2 hr. lec for one half semester. 2 cr.

ABM 219. Desktop Publishing and Advanced Applications
Training in the use of desktop publishing applications for the development of both personal and business-oriented support materials, such as business cards, resumes, posters, and pamphlets. Special fee. 2-2 hr. labs. 4 cr.

ABM 220. Computer Spreadsheet Applications
Training with current spreadsheet software. Emphasis on managerial decision making and problem-solving. The class meets weekly for training, and students work independently on projects they develop in conjunction with the instructor. Special fee. Prereq: ABM major and permission. 2 cr.

ABM 221. Seminar in Marketing and Sales
Marketing and sales techniques for the small business manager, salesperson, or entry-level marketing department employee. Topics include market segmentation, product pricing and differentiation, presentation, negotiation, and closing of a sale. No credit for students taking ABM 214 or FSM 240. 1st quarter module. 1 cr.

ABM 222. Operating Systems and Networking
Training on current PC and networking operating systems including Windows and UNIX. Explores file, disk, and directory management as well as creating and maintaining Ethernet hardware and software. Prereq: ABM Computer Option only. 2 lec. 2 cr.

ABM 223. Seminar in Human Resource Management
Human resource management for small business managers and middle managers in larger firms. Topics include motivation, recruiting, training, and conflict management. No credit for students taking ABM 206. 3rd quarter module. 1 cr.

ABM 224. Seminar in Financial Management
Financial statement preparation and analysis for merchandising and service firms. Tailored to small business managers and middle managers of larger businesses. No credit for students taking ABM 205. 4th quarter module. 1 cr.

ABM 225. Senior Project
Independent study project and research paper relating to a specific management problem. Topic selected by student and adviser. Student must complete 15 weeks of work experience either prior to or during the senior project. 4 cr.

ABM 226. Business Computer Applications
Trains students to use common software as an effective tool to answer business questions and solve complicated problems. Microsoft Office programs including Excel, Access, and PowerPoint are used. Microsoft Office is the standard for almost all business operations and will be helpful in other TSAS courses like Managerial Accounting and Business Policy. Each student creates more than twenty business related spreadsheets, creates and manages multiple databases, and creates several presentations. 4 cr.

ABM 232. Business Law
Background and understanding of the legal aspects of management. Including: contracts, liability and insurance, business law and regulation, employee laws and rights, forms of ownership, tax implications, and other legal matters relevant to successful management. 4 cr.
ABM 240. Ethics in Business and Society
A new look at the interface of managerial and ethical issues as they relate to workers, the workplace and the interface between business and society. Brings together concepts such as profit, values, community and, responsibility to consider a paradigm that meets the needs of an organization and the social environment in which it must exist. Helps students identify methodologies for sustaining business in its function as a responsible force for the betterment of wealth and well being in society. 4 cr.

ABM 242. International Trade Applications
Through textbook readings and classroom discussions, students will learn about the 3 major aspects of foreign trade, the "Market Connection" which revolves around locating, qualifying, and establishing relationships with overseas customers; the "Financial Plan" which ensures that adequate financing is available for start-up, production, and working capital needs; and the "Distribution Process" which involves packaging, customs requirements, shipping, storing and delivery to final destination. Students will establish contacts with individuals and agencies involved in foreign trade, and will develop an "Export Plan" for their selected product(s) or service(s). The traditional classroom/textbook course is enhanced through an intensive field research/industry focused semester project. Prereq: permission of instructor. 2 lec. May repeat once for credit. 4 cr.

ABM 291, ABM 292. Studies
Students who have exhibited the ability and willingness to work independently may design and contract a research project on a topic not available through existing course offerings. Each project is facilitated by faculty/staff member. Credit varies from one to four, depending on depth and breadth of the project. Areas may include, but are not limited to: retail, service or manufacturing, international trade, real estate, hospitality, health and fitness, computer technology, commerce, finance, or philanthropy. 1 to 4 cr.

Civil Technology (CT)
(For program description, see page 126.)

CT 220. Professional Practice
Serves as an introduction to the civil technology program and various fields in the civil environment in a seminar format. Provides for student contact with industry professionals and employment opportunities. Assists with student learning skills and serves as common period for Freshmen guidance on academic matters. 2-hr sem. 1 cr.

CT 222. Computer Aided Design Level I
The student designs fundamental buildings and structures and prepares plans using computer software (AutoCAD). Emphasis is on learning the software, basic design and plan requirements. Students then apply this knowledge to produce presentation drawings and developing proficient skills with this software. The student also works concurrently on course projects. 2-hr lec/2-hr rec. 4 cr.

CT 223. Introduction to Surveying and Mapping
An introduction to the field of surveying and mapping and its fundamental principles, theories and methods. Specifically: horizontal and vertical distance measurements, angle and direction measurements, determination of positions, areas and topographic contours. Includes mapping, geographic information systems and the Global Positioning System, measurement accuracy, and statistical analysis. Coreq: CT 224. 3 cr.

CT 224. Surveying and Mapping Applications
A series of labs and recitations that provide an introduction to the field of surveying and mapping and its fundamental principles, theories and methods. Specifically: horizontal and vertical distance measurements, angle and direction measurements, determination of positions, areas and topographic contours. Includes mapping, geographic information systems and the Global Positioning System, measurement accuracy, and statistical analysis. Coreq: CT 223. 2 cr.

CT 227. Mechanical and Electrical Systems
Description, analysis and design application of conventional heating, ventilation, air conditioning, lighting and plumbing systems. Electrical principles, laws, and installation with emphasis on the National Electrical Code. 2-hr lec/2-hr rec. 4 cr.

CT 230. Statics and Materials
Determining and evaluating physical properties of common building construction materials: wood, steel and non-ferrous metals, cement, concrete, brick, and bituminous materials. Application of materials to design of structural elements in a beam and column applications, under various load conditions. Emphasis on appropriate material selection and optimization of design. Prereq: MTH 203. 2-hr lec/2-hr rec. 4 cr.

CT 231. Design I
Provides foundational skills in critical thinking, design process, verbal and graphic description/idea documentation, project implementation, and creative process activation. Presentation and demonstration skills to be developed as part of individual and group project solutions. Course will develop intermediate CAD skills. Prereq: CT 222. 2-hr lec/2-hr rec. 4 cr.

CT 233. Construction Surveying
This course applies methods and techniques learned in CT 223 to real world situations. The student works as part of a project team on a proposed construction site. Tasks and materials covered include: setting control, mapping of sites, design and layout of roadways, site planning, building and infrastructure layout, area and volume calculations. Class expands on use of survey equipment to include data collectors and land design computer software. Prereq: CT 223 with a grade of C- or better. 2-hr lec/1-hr rec/2-hr lab. 4 cr.

CT 234. Soils and Foundations
Subsurface exploration, soil sampling, testing and evaluating subsurface materials, and their effect on foundations, site development, and construction. Hands-on laboratory component. Introduction to site excavation methods and foundation design. 2-hr rec/2-hr lab/rec. 4 cr.

CT 235. Introduction to Information Technology
This course will provide an introduction to Information Technology and the issues and challenges with managing the computing enterprise in a corporate environment. Topics to be covered include hardware troubleshooting and repair, operating system fundamentals, general application deployment, data communications, networking software and hardware, server security and management, and an introduction to HTML, (Web site) programming. Prereq: AM 280, MTH 203. 2 lec/1 lab 4 cr.

CT 237. Land Design and Regulations
Hydrology of drainage and storm water runoff, basic concepts of hydraulic flow in pipes and channels, and overview of pump systems. Technical and regulatory requirements of designing residential water supply and septic disposal systems. Review of federal, state, and local ordinances with respect to construction and land development. 2-hr lec/2-hr rec. 4 cr.

CT 240. Legal Aspects of Surveying
The legal issues involved when performing a property boundary survey are presented. Ownership of land, the search for boundary evidence, methods of performing research and resolving conflicting information and disputes are discussed. Other topics include: An introduction to legal principles, statutes, case law, terminology, liability, ethics and standards relating to surveying. A course-long project is undertaken whereby research, the search for evidence, a field survey, boundary determination and a plat are completed. Prereq: CT 223 with a grade of C- or better. 2-hr lec/1-hr rec. 3 cr.

CT 243. Advanced Surveying and Mapping
A continuation of surveying topics not covered in CT 223, CT 233 and 240. Specifically: Geodesy, Map Projection Systems, State Plane Coordinates, Control Surveys, Satellite Positioning, Astronomic Observations, Equipment Testing and Adjustment and Theory of Observations. 2-hr lec/2-hr lab. 3 cr.

CT 244. Advanced Surveying Computations
Emphasis on how to perform the typical surveying computations encountered in the field. Use of surveying and computer software and plotters for topographic mapping and subdivision design. Advanced GIS theory and applications including Photogrammetry and Remote Sensing. Field equipment testing and adjustment. Prereq: CT 223, 224, or permission. 3-hr lec/2-hr rec. 4 cr.

CT 247. Construction Contracting
Overview of administrative skills required to manage a construction concern. Emphasis on project management through the entire construction and design process. Building codes and the ADA code included. 2-hr lec/2-hr rec. 4 cr.

CT 281. Architecture I History and Design
Develops a basic understanding of American architectural history while developing architectural programming and design skills in a project based environment. Considerable CAD usage for project submissions 2-hr lec/2-hr rec. 4 cr.

CT 282. Architecture II
Studio application of principles and skills developed in the architectural concentration. Development of a complete shelter system into the design development phase. Prereq: CT 281. 2-hr lec/2-hr rec. 4 cr.

CT 291, CT 292. Studies
Students who have the ability and adequate preparation to work independently may propose a contract to design a course or research project on a topic not available through existing course offerings. The purpose of this research is to explore new areas in the student's field of study or to pursue course material in greater depth. Work is supervised by an appropriate faculty/staff member and credit varies depending on the proposed project and research. Examples may include energy conservation, surveying, construction, or hydrographic surveying. 1 to 4 cr.

CT 297. Work Experience
Career-oriented work experience (10 weeks, full time) to include, but not limited to, architecture, construction, surveying, and mapping. Ce/F.

Thompson School of Applied Science
Community Leadership (CSL)

*(For program description, see page 127.)*

CSL 200. Technology for Community Service and Leadership
This two-credit course will provide students with the skills needed to effectively use Microsoft Office and other related computer applications. During the second half of the semester, students will further develop their computer skills and their social science research skills by completing research assignments and other projects designed to enhance their understanding of the information available to them through Web-based investigation. 2 cr.

CSL 201. Introduction to Community Service and Leadership
This course serves as the foundation course for the Community Service and Leadership Program. Students are introduced to current and historical definitions of community and “service” to the variety of organizations providing service within communities, and to the challenges facing leaders within community organizations as they work to address key problems. All students will participate in a variety of community placements during this course. 4 cr.

CSL 202. Introduction to Nonprofit Organizations
This practical course provides an overview of the unique responsibilities and practices needed to effectively manage a community-based nonprofit organization. Topics include: issues of organizational structure and staffing, strategic planning, board effectiveness, financial management, leadership roles and responsibilities, and public accountability. 4 cr.

CSL 203. Organizing and Supervising Volunteers
This course provides students with the knowledge and skills necessary to design, organize, and manage effective volunteer programs. Topics covered include: identifying organizational volunteer needs, recruiting, supervising, and motivating volunteers, integrating volunteers into the overall goals and services of an organization, and creating effective volunteer training programs. Students will explore resources available for creating a successful volunteer program and will research the variety of approaches to volunteer management that organizations currently use. Permission required. 4 cr.

CSL 204. Managing Change and Conflict in Communities
This course examines a variety of approaches to promoting and responding to community change. Through active participation and analysis of specific community initiatives, students will explore such topics as issue-identification, planning for change, power dynamics and conflict within diverse groups, strategies for action, lobbying, and influencing political action. Prereq: COM 209, 210 or Coreq: COM 210. 4 cr.

CSL 206. Literature of Family and Community
Through a wide range of readings, primarily fiction, this course examines what it means to be an individual living in the context of family and community. Students use these readings both to examine differing concepts of community and to explore how individuals and groups respond to the challenges of creating as well as changing their communities. Coursework involves critical analysis, group-led discussions, and frequent short papers. Prereq: COM 211. 4 cr.

CSL 207. Introduction to Nonprofit Budgeting and Accounting Practices
This course is designed to help students understand the responsibilities of nonprofit financial management. It introduces key budgeting and accounting practices for community-based nonprofit organizations. Students will explore such topics as budget planning and development, budget design, roles and responsibilities of those involved in budgeting, and how to read and interpret financial data. Common nonprofit accounting principles and approaches will also be taught. 3 cr.

CSL 208. Essentials of Grant Writing for Community-Based Organizations
The ability to raise funds is essential to all community-based and nonprofit organizations. This course is designed to provide students with the essential knowledge and skills to develop and execute a successful fundraising program. Topics covered include: prospect research, choosing fundraising strategies, common fundraising mistakes, maintaining relationships with donors, raising money by mail, personal solicitation, event planning, and other key approaches to raising money. 2 cr.

CSL 209. Essentials of Grant Writing for Community-Based Organizations
This course provides the information and skills necessary to research and apply for grants from government agencies, foundations, corporations, and other sources. Students will follow the process of grant-seeking from identifying need through application and follow up. 2 cr.

CSL 210. Capstone Seminar
This seminar provides the opportunity for students in their final semester to synthesize their learning and skills as they broaden their understanding of the political and social policy dimensions of community organizing and leadership. Each student will engage in a significant service project that will be the focal point for both skill application and issue analysis. Prereq: CSL 201, 202, 203, and CSL 205. 4 cr.

CSL 290. Civic and Community Internship
This internship is designed to promote experiential learning about community service and leadership through active involvement within a community organization. It provides students with an opportunity to build upon their skills and interests while developing an awareness of civic and community issues. In addition to participating in community projects, students are expected to reflect upon their experiences and to relate them to assigned reading. Each student will also complete a research project based on a problem encountered at the service site. Prereq: CSL 201 or permission of instructor. May be repeated for up to 8 credits. 2 to 4 cr.

CSL 291, CSL 292. Studies in Community Service and Leadership
Students who have the ability and adequate preparation to work independently may propose a contract to design a course or research project on a topic not available through existing course offerings. The purpose of this research is to explore new areas in the student's field of study or to pursue course material in greater depth. Work is supervised by an appropriate faculty/staff member and credit varies depending on the proposed project/research. Areas may include a specific community leadership/organizing topic. Prereq: CSL 201 or equivalent. 1 to 4 cr.

CSL 297. Work Experience
Career-related internship and/or training (minimum of 50 hours) that enhances previous course work and service-learning experiences in community organizing and leadership. Students may work with a community-based and/or nonprofit organization in a full or part-time position; participate in an internship with an organization that serves the needs of the community; attend UNH's Leadership Program or other leadership programs to learn more about leadership, teambuilding, and other group management skills; create an independent project based on a specific interest; or work with a "for profit" company. Course focus is on learning new skills and developing deeper insights into the work of creating and sustaining community. Required for graduation. Prereq: CSL major. Cr/F.

Food Service Management (FSM)

*(For program description, see page 128.)*

FSM 200. Introductory Chemistry
Introduces chemical concepts and principles, including chemical symbols, conversion factors, chemical calculations, chemical and physical properties, and changes. Touches upon organic compounds—their structure, major reactions, and applications—based on an elementary introduction to biomolecules and how they function in metabolism. Dietetic technician majors only. 3 lec. 3 cr.

FSM 201. Food Preparation Fundamentals
Preparation techniques, knife skills, measurements, food handling, selection, and classification. FSM majors only. 2-hr lec. Restaurant Management majors must also complete a lab. Practical application of skills and techniques utilized in a professional kitchen. 2-hr lec. 2 or 3 cr.

FSM 202. Meal Management
Enhancement of food preparation skills and techniques, recipe conversion, standardization and costing, garnishments, and service, as adapted for hotels and restaurants. Prereq: FSM 201 or permission. FSM majors only. 1-1/2 lec/1 to 3-hr lab. 3 cr.

FSM 203. Introduction to Restaurant and Hospitality Management
This first-semester course introduces students to the field of hospitality and restaurant management. Topics discussed include: forms of business, employment opportunities in the in the field, social and environmental responsibility and ethics, as well as the future of the restaurant and industry. 3 1-hr lec. 3 cr.
FSM 205. Hospitality Computer Applications
Introduction to personal computers and business application software. Utilizing the most recent Windows operating systems with hands-on experience in different software. Topics include word processing (Word), spreadsheets (Excel), and database management (Access). Each of these applications will be presented in relationship to business management responsibilities within the hospitality industry. Concepts/applications such as business letters, reports, contracts, accounting spreadsheets, and customer and employee databases will all be explored. 3 contact hours/lec/lab. 3 cr.

FSM 206. Food and Beverage Operations Controls
An overview of accounting principles with emphasis on managerial accounting as it relates to the food services industry. Cost control with respect to product, labor, purchasing, and physical plant examined in depth. Extensive practical experience in cost control procedures, methods, and techniques utilizing computer spreadsheet applications required. Prereq: FSM 205. 3 1-hr lec/1 2-hr lab. 4 cr.

FSM 207. Hospitality: Sanitation and Safety
The organization, functions, and responsibilities of food services operators in the public and private sectors as they relate to sanitation and safety. Development, control, and implementation of HACCP standards and procedures, pest control, crisis management, safe food production, and accident prevention explored. Also requires students to sit for the Foodservice Sanitation Certification exam as offered by the Educational Foundation of the National Restaurant Association. 1-2 hr lec. 2 cr.

FSM 208. Non-Commercial and Contract Food Service Management
Course focus is on the contract and non-commercial aspect of the food service business. Emphasis is on comparing and contrasting food services offered in healthcare, business and industry, education, recreation and leisure, inflight and vending operations. 3 cr.

FSM 209. Applied Restaurant Operations Management
Students learn hands-on while managing the Balcony Bistro, an upscale, gourmet restaurant open to the public. Emphasis is on plate presentation, kitchen management, front-of-the-house operations, menu pricing, and food and labor cost controls for an on-going restaurant operation. Prereq: FSM 201, 202, and 207. FSM majors only. 1 lec/6-hr lab. 4 cr.

FSM 211. Food and Beverage Facilities Planning
Course covers preplanning and layout of facilities and equipment for various food services operations. Care and maintenance of the physical plant, as well as selection, operation, and placement of essential equipment will be emphasized. Design and development of the operation in relation to the physical plant as well as the product/service offering examined and analyzed. May be repeated. 1-2 hr lec. 2 cr.

FSM 212. Hospitality Personnel Management
A course focusing on motivational theory, personnel administration techniques, and supervisory attitudes that affect employee work performance. Topics discussed specifically reflect human resource issues in the context of the hospitality work environment. 2 lec. 3 cr.

FSM 215. Restaurant And Hospitality Law
Study of the legal environment as it applies to all segments and aspects of food service operations. Topics include common and statutory law with regard to contracts, employment, negligence, public accommodation and disclaimer liability as well as the operator's duty to protect guests and "reasonability." Significant examination of actual case law will be employed. May be repeated. 1 2-hr lec. 2 cr.

FSM 218. Beverage Operations Management
Provides a well-rounded examination of the foundation of knowledge and techniques regarding the history, production, and control of wines, spirits, and other beverages within a food services operation. Additionally, a variety of other topics such as purchasing, staffing, control cost, and safe alcoholic beverage service covered. May be repeated. 2 2-hr lec. 2 cr.

FSM 226. Dining Room Practicum
The fundamental principles of dining room service, organization, and supervision. Students actively participate in real-world applications of techniques and methods associated with effective front-of-the-house operations in a supervised setting. Students will be required to staff all positions at the Balcony Bistro, our on-campus, full-service operation, throughout the semester. 1-hr lec/4-hr lab. 2 cr.

FSM 228. Applied Nutrition
Consideration of the nutritional requirements of healthy individuals and the benefits of good nutrition. Basic study of food and nutrients: functions, sources, requirements, digestion, absorption, and metabolism. Introduction to the science of energy balance, special needs during the life cycle, and selected nutrition problems/controversies. 3 lec. 3 cr.

FSM 229. Applied Nutrition for Dietetic Technicians
Consideration of the nutritional requirements of healthy adults and the benefits of good nutrition. Basic study of nutrients: functions, sources, requirements, digestion, absorption, and metabolism. Introduction to such topics as energy balance, special needs during the lifecycle, and selected nutrition problems/controversies. Incorporates practical application of lecture topics through problem-solving activities completed in the lab. 2 lec/2 lab. 1 cr.

FSM 240. Restaurant Sales and Promotion Management
An overview of fundamental marketing principles as they relate to the food services industry. Evaluation methods for planning, testing, budgeting, and analyzing in-house promotional programs explored in detail. Emphasis will be placed upon techniques and media utilized in the promotion of food and beverage operations. Basics of the marketing mix such as product, price, promotion, and distribution applied to management of a foodservice operation. May be repeated. 2 2-hr lec. 4 cr.

FSM 241. Applied Buffet and Catering Management
Students learn hands-on while managing a weekly international buffet series and catering special events at the Thompson School. Emphasis is on food arrangement and presentation, garden-management, banquet and buffet set-up, garnishing, banquet presentations, and on/off premises catering. Prereq: FSM 201, 202, and 207. FSM majors only. 1 lec/6-hr lab. 4 cr.

FSM 241. Applied Buffet and Catering Management
Students learn hands-on while managing a weekly international buffet series and catering special events at the Thompson School. Emphasis is on food arrangement and presentation, garden-management, banquet and buffet set-up, garnishing, banquet presentations, and on/off premises catering. Prereq: FSM 201, 202, and 207. FSM majors only. 1 lec/6-hr lab. 4 cr.

FSM 245. Situational Analysis of the Hospitality Industry
Focuses on the hospitality industry in the context of the world of business. Emphasis will be placed upon strategic thinking and planning applicable to this industry. May be repeated. 2 2-hr lec. 4 cr.

FSM 246. Community Nutrition Practicum
A study of community programs and agencies providing food and nutrition services to age groups throughout the life cycle. Emphasis is on assessment of nutritional needs in the community. Prereq: FSM 229, NUTR 510. Coreq: FSM 260. 2 lec. 2 cr.

FSM 250. Managerial and Clinical Dietetics Practicum
Supervised practice in current foodservice systems and clinical practice in healthcare institutions. Students will participate in the activities of a foodservice operation including menu planning, food purchasing and production, delivery and service, sanitation and safety, management and supervision as well as quality improvement. Students also participate in patient care activities in the nutrition department including nutrition screening and assessment, development of patient care plans and documentation. Majors only. Prereq: FSM 201, 207, 228/229, 278, NUTR 476, 503, 504, 510. Coreq: FSM 275. 7 cr.

FSM 251, FSM 291. Independent Studies in Restaurant Management
Students who have the ability and adequate preparation to work independently may propose a contract to design a course or research project on a topic not available through existing course offerings. The purpose of this research is to explore new areas in the student's field of study or to pursue course material in greater depth. Work is supervised by an appropriate faculty/staff member and credit varies depending on the proposed project/research. Independent studies may include experiences in culinary, dining room, or marketing. 1 to 4 cr.

FSM 250. Managerial and Clinical Dietetics Practicum
Supervised practice in current foodservice systems and clinical practice in healthcare institutions. Students will participate in the activities of a foodservice operation including menu planning, food purchasing and production, delivery and service, sanitation and safety, management and supervision as well as quality improvement. Students also participate in patient care activities in the nutrition department including nutrition screening and assessment, development of patient care plans and documentation. Majors only. Prereq: FSM 201, 207, 228/229, 278, NUTR 476, 503, 504, 510. Coreq: FSM 275. 7 cr.

FSM 251, FSM 291. Independent Studies in Restaurant Management
Students who have the ability and adequate preparation to work independently may propose a contract to design a course or research project on a topic not available through existing course offerings. The purpose of this research is to explore new areas in the student's field of study or to pursue course material in greater depth. Work is supervised by an appropriate faculty/staff member and credit varies depending on the proposed project/research. Independent studies may include experiences in culinary, dining room, or marketing. 1 to 4 cr.

FSM 260. Community Nutrition Practicum
Exploration and participation in programs and organizations that offer nutrition services to the community. Hands-on activities vary from year-to-year with emphasis on providing nutrition education using a variety of curricula presented to varying age groups throughout the lifestyle cycle including: Head-start, Cooperative Extension (EFNEP&-HI), the Elderly Nutrition Program, as well as public schools and various low-income groups. Prereq: FSM 229, NUTR 476; N’TR 510, majors only. Coreq: FSM 265. 5 cr.

FSM 265. Community Nutrition for Dietetic Technicians
A study of community programs and agencies providing food and nutrition services to age groups throughout the life cycle. Emphasis is on assessment of nutritional needs in the community. Prereq: FSM 229, NUTR 510. Coreq: FSM 260. 2 lec. 2 cr.

FSM 275. Diet Therapy
The study of therapeutic nutrition. Review of the physiology related to nutrition disorders so that students can calculate the most common modified diets. Prereq: FSM 200, 229, NUTR 476, 510; ZOOL 401. 2-hr lec/3-hr lab. 3 cr.

FSM 278. Applied Principles of Food Preparation
Principles and techniques of food selection, preparation, and presentation in relation to quality and acceptability. Dietetic Technician students only. 2 lec. 1 cr.

FSM 290. Managerial and Clinical Dietetics Practicum
Supervised practice in current foodservice systems and clinical practice in healthcare institutions. Students will participate in the activities of a foodservice operation including menu planning, food purchasing and production, delivery and service, sanitation and safety, management and supervision as well as quality improvement. Students also participate in patient care activities in the nutrition department including nutrition screening and assessment, development of patient care plans and documentation. Majors only. Prereq: FSM 201, 207, 228/229, 278, NUTR 476, 503, 504, 510. Coreq: FSM 275. 7 cr.

FSM 291, FSM 291. Independent Studies in Restaurant Management
Students who have the ability and adequate preparation to work independently may propose a contract to design a course or research project on a topic not available through existing course offerings. The purpose of this research is to explore new areas in the student's field of study or to pursue course material in greater depth. Work is supervised by an appropriate faculty/staff member and credit varies depending on the proposed project/research. Independent studies may include experiences in culinary, dining room, or marketing. 1 to 4 cr.

FSM 294. Studies in Dietetic Technology
A Dietetic Technician Practicum. Students gain hands-on experience in one of the following: A) Food Service Management; B) Clinical Nutrition; C) Community Nutrition. Prereq: permission of instructor and students advisor. 3 to 6 cr.

FSM 295. Dietetic Seminar
Preparation of a professional resume, skills and preparation for the registration exam for dietetic technicians, overview of professional portfolios for continuing education in the field of dietetics. Prereq: majors only. Cr/F. 1 cr.
Forest Technology (FORT)

(For program description, see page 128.)

FORT 260. Forest Mapping
Skill and efficiency is developed in analyzing field survey data, plotting, lettering and finishing topographic and planimetric maps and road plans, both manually and by Computer Assisted Drafting. Mapping work is closely coordinated with field work accomplished in Forest Surveying (FORT 266). 1 lec/1-2 hr lab. 2 cr.

FORT 261. Dendrology
Identification and nomenclature of forest trees and shrubs which are important to the ecology and economy of the Northeastern forest. The identification of plant relationships with other plants, animals, soil, and site regimes. 1 lec/1-4 hr lab. 3 cr.

FORT 263. Forest Ecology
The interactions of forest trees with their environment, both as individuals and as tree communities; environmental problems affecting plant communities; the history and classification of North American forests. Study of soils as they affect forest distribution and tree growth. 2 lec/1-2 hr lab. 3 cr.

FORT 264. Arboriculture
Tree selection, care, and maintenance in the urban environment. Includes climbing, safety practices, pruning, transplanting, and fertilizing. Prereq: FORT 263 or permission. 1 lec/1-4 hr lab. 3 cr.

FORT 265. Forest Orientation Seminar
Seminar to prepare freshmen for study and placement in the broad area of forest technology. 1 lec. Cr/F. 1 cr.

FORT 266. Forest Surveying
Provides instruction and experience in running cruise lines and in the survey and identification of rural property lines. The focus is on field surveying techniques and problem solving of special importance to foresters. Use of magnetic survey data in rural property measurement. Elementary office computations are taught. 2 lec/1-4 hr lab. 4 cr.

FORT 267. Leadership, Supervision, and Safety Practices
Fundamentals of leadership and supervision including effective communication, job organization, planning, personnel training and motivation, problem-solving and decision-making techniques, accident prevention, first aid, and CPR instruction. 2 lec. 2 cr.

FORT 269. Wildlife Ecology and Conservation
Foresters directly influence wildlife by manipulating habitat through silvicultural operations. Course focuses on the ecology of New England wildlife species with emphasis on their habitat requirements and the enhancement of habitat through silviculture and the use of best management practices. 3 cr.

FORT 270. Applied Silviculture
Silvicultural practices in the U.S. including reforestation systems. Improvement of forest stands, employing the basic tending practices of weeding, thinning, and pruning. Marking of stands prior to logging operations. Prereq: permission of instructor or FORT 261 and 263. 3 lec/2 hr lab. 4 cr.

FORT 272. Mensuration
Field application of forest inventory and timber cruising techniques. Measurement of tree form, volume, quality, and defect. Growth prediction of individual trees and stands. Use of basic statistical methods as a tool in cruising. Prereq: FORT 261 or instructor permission. 2 lec/1-4 hr lab. 4 cr.

FORT 273. Management Operations and Analysis
Forest appraisal and valuation methods, timber sale contracts, depreciation, taxation, and deflection calculations, forest taxation. Essentials of forest regulation and management planning. 2 lec/1 lab. 3 cr.

FORT 274. Industrial Forest Management Tour
Concentrated field experience and intensive observations of industrial, private, and federal forest holdings, emphasizing forest management operations as currently practiced in New England. Two weeks of concentrated field study. Prereq: permission of instructor or FORT 261 and 263. 3 lec/2-hr lab. 4 cr.

FORT 275. Arboriculture
Tree selection, care, and maintenance in the urban environment. Includes climbing, safety practices, pruning, transplanting, and fertilizing. Prereq: FORT 263 or permission. 1 lec/1-4 hr lab. 3 cr.

FORT 277. Logging
Harvesting methods, their physical layout and economy, relationship to silviculture, and protection. Maintenance of logging tools and machinery. Foremanship and woods safety are stressed. Prereq: permission. 2 lec/4 hr lab. 4 cr.

FORT 278. Forest Insects and Diseases
An introduction to the role of forest insects and microorganisms in the context of managing woodlands. Students learn to recognize the signs and symptoms of insect and disease damage in forest trees and products. They study the life cycles and identify common forest insect and disease pests impacting North American tree species. Pest management methods are introduced. 1 lec/2-hr lab. 2 cr.

FORT 279. Forest Fire Control and Use
Instruction in forest fire suppression methods. Interactions of forest fuels, topography, and weather as they affect forest fire behavior. Use of controlled fire as a tool in forest and wildlife management. 4 hr lab. 2 cr.

FORT 280. Aerial Photography
Interpretation and Geographic Information Systems
The use of aerial photographic interpretation as it applies to the identification and measurement of forest resources and applications in forest mapping.

Horticultural Technology (HT)

(For program description, see page 129.)

HT 201. Freshman Seminar
An introduction to the horticulture technology, the Thompson School, and the University: programs, expectations, advising, and resources. Survival skills for college including time management, study skills, and note-taking. Career preparation including portfolios, resumes, professional organizations, and continuing education. Special fee. 1 hr. lec. Cr/F. 1 cr.

HT 204. Plant Propagation
Reproduction of plants for horticultural purposes by sexual and asexual methods. Seeds, cuttings, separation, division, layering, grafting, budding, and in vitro propagation. Special fee. Prereq: HORT 207 or permission. 2 lec/1 lab. 4 cr.

HT 205. Plants, People, Place
An introduction to the New England biome through exploration of the interrelationships of plants and plant communities, humans and human culture, and the landforms and natural systems of New Hampshire. Includes field identification of common native and exotic plant species. Special fee. 1 lec/1 lab. 2 cr.

HT 207. Plant Structure and Function
Morphology, anatomy, and physiology, with emphasis on the higher plants. Horticultural implications. Lab stresses observations and manipulations of the particulars of plant life. Special fee. 2 rec/1 lab. 4 cr.

HT 215. Soils and Land Use
Introduction to soils with emphasis on physical, morphological, chemical, and biological characteristics and their applications in horticultural land use decisions. Includes soil genesis and classification and soil survey use. Special fee. 3 rec/1 lab/7 wks. 2 cr.
HT 217. Soils and Plant Nutrition
Role of nutrition in plant health care. Macro- and micro-nutrient needs, nutrition deficiency symptoms, soil testing, and fertilizer application techniques in both soil and soil-less media. Special fee. 3 rec/1 lab/7 wks. 2 cr.

HT 219. Computers in Horticulture
Selection and use of microcomputers in horticulture: word processing, spreadsheets, database management, Power Point, and graphics. 1 lec/1 lab. 1 cr.

HT 227A. Horticultural Facilities Management
Layout, construction, management principles, and horticultural technique used on controlled growth structures, including greenhouses, cold frames, and lath houses. Includes practicum in daily operation of Thompson School horticultural facilities. Special fee. 1 lec/1 lab. 2 cr.

HT 227B. Horticultural Facilities Management
Layout, construction, management principles, and horticultural technique used on controlled growth structures, including greenhouses, cold frames, and lath houses. Includes practicum in daily operation of Thompson School horticultural facilities. Special fee. 1 lec/1 lab. 2 cr.

HT 227C. Horticultural Facilities Management
Layout, systems, construction, management principles, and horticultural techniques used in controlled growth structures, including greenhouses, propagation houses and beds, cold frames, hoop houses, and lath houses. Includes practicum in daily operation of Thompson School horticultural facilities, with second-year focus on scheduling and supervision. 2 lab. 1 cr.

HT 227D. Horticultural Facilities Management
Layout, systems, construction, management principles, and horticultural techniques used in controlled growth structures, including greenhouses, propagation houses and beds, cold frames, hoop houses, and lath houses. Includes practicum in daily operation of Thompson School horticultural facilities, with second-year focus on scheduling and supervision. 2 lab. 1 cr.

HT 234. Pest Management
Introduction to pests of horticultural plants, including diseases, insects, and weeds. Symptoms, morphology, identification, life cycles, impacts, and management measures. Emphasis on integrated pest management. Special fee. 3 lec/1 lab. 4 cr.

HT 240. Introduction to Floral Design
Basic arrangements, including symmetrical and asymmetrical, circular, triangular, and line pieces; and the basic corsage designs used by florists. Application of principles to designs during laboratory sessions. Special fee. 1 lec/1 lab. 2 cr.

HT 244. Advanced Floral Design
Color and its use; planning both wedding and sympathy floral pieces; comparing traditional and contemporary design techniques and materials; construction of bridal bouquets and other essential bridal designs, sympathy pieces and tropical/dried floral pieces during lab sessions. Prereq: HT 240 or permission. Special fee. 1 lec/1 lab. 2 cr.

HT 250. Flower Show Design and Construction
Design, construction, and maintenance of the Thompson School horticultural exhibit at a public flower show. May be repeated. Special fee. 1 rec. 1 cr.

HT 251. Introduction to Design Communication
Introduction to methods of communicating garden and landscape design. Lab work covers selected 2-D and 3-D tools and techniques, including instrumental drafting, modeling, and computer-aided drafting and design (CADD). Special fee. Prereq: HT 219. 1 lec/1 lab. 2 cr.

HT 254. Irrigation Design
Design, installation, and operation of irrigation systems in the greenhouse, nursery, field crops, and landscape. Special fee. 1 lec/1 lab. 3 cr.

HT 256. Horticultural Pruning
Basic pruning techniques for fruits and ornamentals: apples, peaches, raspberries, blueberries, grapes; deciduous and evergreen shrubs and trees; herbaceous materials. Prereq: HT 205 or equivalent. Special fee. 1 lec/1 lab. 2 cr.

HT 257. Woody Landscape Plants
Identification, morphology and classification of Woody plant materials of importance in ornamental horticulture in the Northeast including deciduous and evergreen trees, shrubs, vines and groundcovers. Woody plant selection for landscape situations. Special fee. Prereq: HT 205. 2 lec/1 lab. 3 cr.

HT 258. Herbaceous Ornamental Plants
A comprehensive study of herbaceous ornamental plants including morphology, classification, identification, and usage of common perennials, annuals, ferns, ornamental grasses, herbs, and bulbs used in the Northeast. Production, installation, and maintenance of herbaceous ornamentals is also included. Prereq: HT 205 or permission. Special fee. 1 lec/1 lab. 2 cr.

HT 260. Grounds Maintenance
Introduction to the principles and practices of maintaining public and private grounds—residential, commercial, institutional, recreational. Field work emphasized. Special fee. 4 hour lab/7 wks. May be repeated for a maximum of 2 credits. 1 cr.

HT 263. Landscape Construction
Materials and methods of landscape construction: grading and drainage, site preparation, transplanting, turf installation, pavements, walls, and retaining walls, wood structures. Introduction to construction drawings, specifications, estimating, and bidding. Special fee. Prereq: HT 205, 215. 4 lec. 4 cr.

HT 266. Garden Design and Culture
Design, installation, and maintenance of flower gardens in New England. Includes perennial, annual, herb, bulb, and combination gardens. Also covers business aspects of gardening, including estimating. Field trips. Coreq: HT 258. Special fee. 3 lec/1 lab/7 wks. 2 cr.

HT 270. Grounds Management
Grounds management with emphasis on field organization and project supervision. Special fee. Prereq: HT 260. 1 lec/4-hr. Lab/7 wks. May be repeated for a maximum of 4 credits. 2 cr.

HT 272. Landscape Design Studio
Principles of residential and commercial landscape design: site analysis, spatial organization, graphics and drafting, use of landscape fixtures and plant materials, final plans and specifications, cost estimates. Special fee. Prereq: HT 257 and 263. 2 lec/4-hr. lab. 4 cr.

HT 275. Floricultural Crop Production
Leading cut-flower crops, potted plants, and bulbous crops, including cultural requirements, crop timing, harvesting procedures, distribution systems, and marketing principles. Special fee. Prereq: permission. 2 lec/1 lab. 2 cr.

HT 276. Bedding Plant Production
Bedding plant production, cultural requirements, crop timing, harvesting procedures, distribution systems, and marketing principles. Includes common annuals, perennials, vegetables, and herbs of the Northeast. Field trips. Special fee. Prereq: permission. 3 lec/1 lab/7 wks. 2 cr.

HT 286. Fruit and Vegetable Production
Tree fruits (apple, pear, and peach) small fruits (strawberries, raspberries, grapes and blueberries) and vegetables grown in New England will be covered. Information will emphasize the growing, maintenance and the marketing of fruits and vegetables from the garden center perspective. Special fee. 2 lec/1 lab. 3 cr.

HT 288. Horticultural Business Management
Business principles and practices in the formation, operation, and growth of horticultural enterprises. An introduction to marketing, accounting, personnel, and operation management. HT majors only. Special fee. 4 lec. 4 cr.

HT 291, HT 292. Studies
Students who have the ability and adequate preparation may propose a contract to design a course or research project on a new topic not available through existing course offerings. The purpose of this research is to explore new areas in the student's field of study or to pursue course material in greater depth. Work is supervised by an appropriate faculty/staff member and credit varies depending on the proposed project/research. Areas may include floriculture, floral design, nursery, landscape, and horticultural therapy. Permission required. Course may be repeated up to a maximum of 6 credits. 1 to 3 cr.

HT 293. Field Operations
Seven-week or fourteen-week modules of field experience in selected areas of horticulture under the supervision of an appropriate member of the faculty/staff. A student may enroll in two modules per term. A) Floriculture; B) Floral Design; C) Nursery and Garden; D) Landscape; E) Horticultural Therapy. Special fee. Prereq: permission of instructor and student's adviser. 1 to 3 cr.

HT 294. Field Operations
Seven-week or fourteen-week modules of field experience in selected areas of horticulture under the supervision of an appropriate member of the faculty/staff. A student may enroll in two modules per term. A) Floriculture; B) Floral Design; C) Nursery and Garden; D) Landscape; E) Horticultural Therapy. Special fee. Prereq: permission of instructor and student's adviser. 1 to 3 cr.

HT 297. Horticultural Work Experience
A guided work experience in a student-selected area of horticulture, providing both a broad overview and a detailed understanding of work in the field. Contracting with an employer for 480 hours of career-oriented work, the student is assigned a wide variety of duties and responsibilities typical of that business or organization. Students maintain a detailed reflective journal of the experience, a portfolio-based summary report, and thorough self-evaluations. Cr/F. 2 cr.
TSAS Communication (COM)

COM 209. Expository Writing and Reading
Weekly writing and individual conferences. Frequent reading assignments related to the writing. 3 lec/1 tutorial. 4 cr.

COM 210. Public Speaking
Frequent speaking exercises to develop the skill and confidence to speak in a variety of public situations. 2 lec. 2 cr.

COM 211. Critical Reading
Frequent readings of short nonfiction and fiction. Class discussions and writing assignments designed to develop skill in reading with critical discernment. 2 lec. 2 cr.

COM 212. Technical Writing
Practice in various forms of technical writing: technical instructions and descriptions, reports, proposals, business letters, and more, with particular emphasis on the importance of layout and design. 2 lec. 2 cr.

COM 291, COM 292. Studies in Communications
Students who have the ability and adequate preparation to work independently may propose a contract to design a course or research project on a topic not available through existing course offerings. The purpose of this research or scholarly endeavor is to explore new areas in the student’s field of study or to pursue course materials in greater depth. Work is supervised by an appropriate faculty/staff member and credit varies depending on the proposed project/research. Areas may include the art of persuasive speaking, writing, literature, or technical reporting. Permission required. 1 to 3 cr.

TSAS Mathematics (MTH)

MTH 201. Math I
Arithmetic of whole numbers, integers, decimals, percents, and fractions. Applications of mathematics, measurement and the metric system. Probability, problem solving and business graphing. 3 lec. 3 cr.

MTH 202. Math II
Creative reasoning and problem solving. Algebraic topics, powers, roots, equations, ratios, and proportions. Geometry topics, triangles, similar figures, polygons, measurement (English and Metric), linear functions, business functions and graphing. Prereq: pass a pretest. 3 lec. 3 cr.

MTH 203. Algebra and Trigonometry
Basic algebra topics, radicals, exponents, introduction to functions and graphs, simple applications of algebra. Trigonometric functions of angles; applications of right triangles, identities, and equations. 3 lec. 3 cr.

TSAS Social Science (SSCI)

SSCI 201. Human Relations
Learn theories of human behavior and develop skills for applying these concepts in the creation of more effective interpersonal and professional relationships. 4 cr.

SSCI 202. Social Issues
Study of social problems in today’s world. Particular emphasis on various viewpoints of their causes and solutions. Issues covered range from individual to worldwide. 4 cr.

SSCI 203. Environmental Issues and Society
Course focuses on contemporary environmental problems and their relationship to society. Students examine the nature and extent of specific problems, such as pollution or global warming, and review current thinking about causes, possible interrelationships, and proposed solutions. 2 lec. 2 cr.

SSCI 204. Leadership Effectiveness and Group Performance
By studying various theories of group development and leadership approaches, students explore the ways leaders influence group behavior and goal attainment. Students practice applying theories to specific situations and explore their own individual strengths and weaknesses as both leaders and group members. 2 cr.

SSCI 291, SSCI 292. Studies
Students who have the ability and adequate preparation to work independently may propose a contract to design a course or research project on a topic not available through existing course offerings. The purpose of this research is to explore new areas in the student’s field of study or to pursue course material in greater depth. Work is supervised by an appropriate faculty/staff member and credit varies depending on the proposed project/research. Areas may include a specific social science topic. Course may be repeated up to a maximum of 8 credits. 1 to 4 cr.
University of New Hampshire at Manchester

The following courses are normally offered only at the University of New Hampshire at Manchester. For more information, see page 131 or contact UNH Manchester at University Center, 400 Commercial Street, Manchester, NH 03101; phone (603) 641-4321; fax (603) 641-4308.

Administration (ADM)

(For program description, see page 133.)

ADM 400. Introduction to Business
Introduces the study of business: examines the origins and development of American business, its place in a global economy, and its legal and ethical roles in modern society. Includes an overview of the functional areas of business such as finance, marketing, and organizational behavior. Designed for business majors as well as for students considering a major in business. 4 cr.

ADM 430. Introduction to Business Statistics
The use of statistical methods for managerial decision making. Emphasis is on understanding concepts, including inferences from sample data and model formulation, as aids in decision-making. Lab: Using class-focused statistics problems, designed to provide opportunity to develop course-specific problem solving strategies; to adapt from mathematical to statistical thinking; to analyze and communicate significance and meaning of numerical outcomes; to develop course-specific tests taking prowess. No credit for students who have received credit for BIOL 528; ADMN 420; EREC 525; HHS 540; MATH 639; MATH 644; PSYC 402; SOC 50. 4 cr.

ADM 532. Introduction to Financial Accounting
Fundamental concepts of accounting and their impact on the business world and society as a whole. Emphasis on the recording of economic transactions, and preparation and analysis of financial statements. No credit for students who have had ACFI 501, 502, ADMN 502. 4 cr.

ADM 533. Introduction to Managerial Accounting
Emphasizes how organizational managers use accounting information to support their functions of planning, control, and decision making. Examples taken from corporations, small business, and not-for-profit organizations. No credit for students who have received credit for ACFI 503, ADMN 503. Prereq: ADM 532. 4 cr.

ADM 601. Financial Management
Study of investment, finance, and dividend decisions of the business firm. Topics include capital budgeting, designing and issuing securities, management of working capital and evaluating manager performance. Prereq: completion of Introductory Business Core or permission. 4 cr.

ADM 602. Organizational Behavior
Applications of behavioral science concepts to work settings. Topics include worker incentives and perceptions toward work, group versus individual decision making, conflict resolution, interpersonal and leadership skills, and the study of other behaviors relevant to effective managing of a business organization. Prereq: Completion of Introductory Business Core or permission. Special fee. 4 cr.

ADM 650. Operations Management
Studies the operational issues and problems related to the design and implementation of an organization's production process. Topics include production planning and analysis, inventory and quality control, scheduling, and methods for evaluating production performance in both the goods and service sectors of the economy. Prereq: Completion of Introductory Business Core or permission. 4 cr.

ADM 675. Special Topics Business Administration
Provides students with an opportunity to explore a topic in business administration such as marketing, management, finance, or accounting. Topics will vary. Barring duplication of subject, may be repeated for credit. Prereq: Completion of Introductory Business Core or permission. 4 cr.

ADM 685. Applications in Business Management
Selected topics. Topics will vary. Barring duplication of subject, may be repeated for credit. 4 cr.

ADM 695. Independent Study in Business
Independent study exploring a special topic emphasizing the managerial, organizational, strategic, political or economic context(s) within which business decisions are made. Prereq: ADM 400 and permission of instructor. 1 to 4 cr.

ADM 701. Business, Government and Society
Examines relationships between business and its broader social, political and economic contexts. Topics include business ethics, social responsibilities, the impact of globalization, the impact of government policies, and how business influences government. Prereq: ADM 620 or permission. Writing intensive. 4 cr.

ADM 750. Business Internship Seminar
A seminar course in which students report on and discuss their business internship experiences. Selected group readings and written and oral student presentations. Prereq: ADM 620 and senior standing or permission. 4 cr.

ADM 760. Applied Senior Project
An independent study research project involving an in-depth exploration into a business topic chosen in consultation with a faculty member. Designed for students with extensive prior work experience. Prereq: ADM 620 and senior standing or permission. 4 cr.

ADM 770. Special Topics Senior Seminar
In-depth exploration into the theoretical and applied aspects of a special business topic. Topics vary according to instructor. Prereq: ADM 620 and senior standing or permission. 4 cr.

American Sign Language (ASL)
(For program description, see page 139.)

ASL 435. American Sign Language I
Introduction to American Sign Language with emphasis on visual receptive and expressive use of language, as well as providing opportunities for other forms of visual communication such as facial expression, mime, and gesture. Participants develop their skills through videotapes, classroom participation, and readings that cover issues important to the deaf community. Limited to 15 students. Special fee. No credit if credit has been received for COMM 533. 4 cr.

ASL 436. American Sign Language II
Continuation of ASL 435 and expansion on concepts and principles. Focus on more advanced vocabulary and patterns of grammar; use of space and modulation of signs to denote aspects of time and location; and additional information on deaf culture. Prereq: ASL 435 or program evaluation. Limited to 15 students. No credit if credit has been received for COMM 733. 4 cr.

ASL 531. American Sign Language III
Continuation of ASL 436. Expands on ground-work and grammatical principles established in ASL I and II. Introduces the sociolinguistics aspects of ASL as it functions within the deaf cultural context. Limited to 15 students. Prereq: ASL 436 or program evaluation. 4 cr.

ASL 532. American Sign Language IV
Continuation of ASL 531. Expands on the groundwork and grammatical principles established in ASL I, II, and III. Introduces the sociolinguistic aspects of ASL as it functions within the deaf cultural context. Areas of investigation include use of formal versus informal sign register; sign variation by region, age, and gender; social factors that give rise to code switching; and political and cultural evolution of the U.S. deaf community. Taught in the target language using the direct experience method. Prereq: ASL 531 or program evaluation. Limited to 15 students. 4 cr.

ASL 599. Special Topics in American Sign Language/Deaf Studies
Selected topics related to American Sign Language and deaf studies that vary by semester. Description available in departmental office during preregistration. May be repeated for credit if topics differ. 1 to 4 cr.

ASL 621. Advanced American Sign Language Discourse for Interpreters
Focuses on the use of ASL discourse in formal as well as informal settings. Students explore the genres of public speaking, artistic expression, formal discussion, interview, and narrative. Development of ASL vocabulary in specialized areas not covered in previous courses. Prereq: ASL 532. 4 cr.
Biology (BIOL)

BIOL 413. Principles of Biology I
Lecture and Laboratory introduction to biological principles; cell structure, function, replication, energetics and transport; mechanisms; physiological processes; Mendelian, molecular genetics and gene technology. Required for students majoring in the life sciences. Cannot be taken for credit after BIOL 411 or equivalent. Special fee. Lab. 4 cr.

BIOL 414. Principles of Biology II
Lecture and laboratory survey of the five kingdoms of life; physiology of cells, tissues, organs, and organ systems; evolution; human impact on the biosphere. Required for students majoring in the life sciences. Cannot be taken for credit after BIOL 412 or equivalent. Special fee. Lab. 4 cr.

BIOL 520. Our Changing Planet
Ecosystem interrelations and factors critical to maintain sustainability will be addressed in this course. Environmental issues such as water usage, pollution, and treatment; air and soil quality; fossil fuels and alternative energy sources will be presented. Not for credit if credit earned for ENE 520. 4 cr.

Communication Arts (CA)

For program description, see page 134.

CA 444. Manipulating Media: Exploring Image and Sound Aesthetics
An introductory exploration of moving image and sound with an emphasis on discovering how aesthetic choices impact media messages. Students investigate aesthetic principles by finding, making, and working with digital media, animation, video, audio, and film. This is not a production course, but rather a fundamental, hands-on production is taught. No credit if credit received for CA 502. Special fee. 4 cr.

CA 450. Introduction to Public Speaking
Theories of rhetoric applied to the practice of speech composition, oral performance, and critical evaluation. Focus on student speeches for a variety of situations and audiences. Not for credit if credit earned for CMN 500. 4 cr.

CA 501. Interpersonal Communication in the Urban Community
Field-based learning experiences. Connects students to the urban community and integrates their classroom education within a business or organizational setting. Students work under the direction of a faculty adviser and workplace supervisor to fulfill the obligations of the workplace internship plan and to complete individually-designed academic projects. Projects must be approved in advance by the faculty adviser. Open to matriculated students with a GPA of 2.50 or better and junior standing. Permission of instructor required. May be repeated for up to 8 credits, with 4 credits maximum accepted toward satisfaction of requirements for the CA major. Cr/F. 1 to 4 cr.

CA 502. Image and Sound
Image and Sound is a foundation course in the aesthetics of motion picture and sound production. This course explores the aesthetic principles that are used to communicate stories, emotions and messages in popular media. Students will study film, television and new media and survey production methods. This is not a production course per se, but is particularly helpful to students interested in working with digital media, animation, video, audio, and film. This is not a production course, but rather a fundamental, hands-on production is taught. No credit if credit received for CA 502. Special fee. 4 cr.

CA 504. Film Criticism
An introduction to the practice of film criticism. Critique of film as both art form and medium of communication. Examines the process of film production, basic principles of film form, techniques of film style, and major approaches to film criticism. Prereq: ENGL 401 and CMN 455 or permission. Special fee. 4 cr.

CA 506. Gender
How gender is created, maintained, repaired, and transformed through communication. Examines communicative processes, conflicts among the relationships between sex and gender, language, cultural mythologies, identity, health care, sexuality, and strategies for resisting conventional gender definitions. Prereq: CMN 457 or permission. 4 cr.

CA 508. Conflict in Relational Communication
Introduces communication theories relevant to the study of conflict interaction in interpersonal relationships. Considers interpersonal concerns contributing to conflict such as power, face-saving, and goals. Examines behaviors that affect our ability to resolve conflict, and strategies, such as mediation, to resolve conflict. Develops the ability to diagnose productive and destructive conflict patterns in relationships. The course is both theoretical and practical in orientation. A combination of lecture, discussion, case studies, and in-class group assignments are employed. Prereq: CMN 457. 4 cr.

CA 510. Language and Interaction
Examines how identities, relationships, and social realities are constituted through language and interaction. Specific topics include perception, meaning, metaphor, power, gender, illness, and the environment. Prereq: CMN 457 or permission. 4 cr.

CA 512. Scriptwriting
Examines the preproduction phase of moving image media, focusing especially on the art and business of writing for the screen. Covers the process of developing student work from original story idea to completed, first draft screenplay. Topics include script formats, narrative structure, plot development, characterization, style, and marketing strategies. Prereq: ENGL 401 plus either CMN 455 or 456; or permission. Writing intensive. 4 cr.

CA 513. Radio News Production
Theories and practice of producing news stories for radio. Covers the research, organization, and technical skills necessary to produce a basic three- and half to four-minute radio piece that includes three interviews, a scene created with sound, instructions for a studio mix, and a host introduction. Intended for beginning and intermediate students who have a strong interest in news writing and news production. Prereq: ENGL 401, plus CMN 455; or permission. Special fee. Writing intensive. 4 cr.

CA 514. Fundamentals of Video Production
Beginning electronic field production using digital video and nonlinear editing formats. Covers basic aesthetic principles and practices of video communication. Introduces techniques for effective image and sound recording in the field, fundamentals of shot and sequence construction, and basic post-production practices on nonlinear editing systems. Prereq: ENGL 401, CA 502 or CA 444, CMN 455, or permission. Preference given to CA majors. Special fee. 4 cr.
CA 515. Advanced Video Production
Advanced electronic field production and post production using digital video and nonlinear editing formats. Emphasizes original student work of increasing conceptual, formal, and technical complexity that begins to incorporate a wider range of images, sounds, and editing techniques. Prereq: CA 514 or permission. Preference given to CA majors. May be repeated, with permission, to a maximum of 8 credits. Special fee. 4 cr.

CA 516. Scriptwriting
The strategies of art and persuasion in the craft of professional scriptwriting for a variety of modes, audiences, and exigencies. Examines a wide array of famous speeches from political, literary and cinematic sources to uncover the fundamental theories of rhetoric and persuasion at work in these texts. Application of these theories and strategies of persuasion in original scriptwriting projects. Prereq: ENGL 401 plus CMN 456; or permission. 4 cr.

CA 520. Special Topics in Applied Communication
New or specialized topics in applied communication not covered in regular course offerings. Topics vary; descriptions listing course content and any prerequisites are available during preregistration. May be repeated for credit if topics differ for a maximum of 12 credits. Prereq: contingent on topic. 1 to 4 cr.

CA 525. Media Programming
Process of program planning for electronic media. Covers the contexts—social, cultural, institutional, economic, regulatory—within which decisions concerning program selection, form, content, and scheduling are made. Prereq: CMN 455 or permission. 4 cr.

CA 526. Organization of Newswork
Examines news as socially situated discourse. The professional norms, work routines, representational practices, ideologies, and ethics of news producing organizations. Prereq: CMN 455 or permission. 4 cr.

CA 527. History of Film
The history of film since 1948. Historical analysis of the development of cinema since the emergence of television, both in the United States and abroad. Selected topics include cinema and the cold war, international stylistic movements, film exhibition, the decline of the studio system, new technologies, third cinema, globalization and economic consolidation. Prereq: CMN 455 or permission. Special fee. 4 cr.

CA 528. Media Policy and Law
Nature, scope, history and current practice of federal regulation over broadcast and related telecommunications media. Emphasis on FCC policies and procedures in the United States with some coverage of comparative regulatory systems. Prereq: CMN 455 or permission. 4 cr.

CA 531. History and Organization of Advertising
Examines the development of advertising in historical context, focusing on the evolving structure and function of advertising agencies, market research practices, advertising design, anthropological approaches to advertising and consumer culture, and contemporary policy issues. Prereq: CMN 455 or permission. 4 cr.

CA 535. Marital Communication
Introduces students to the study of communication in marital relationships. Examines the major theoretical orientations that characterize the marriage field and investigates the processes by which communication facilitates or hinders marital adjustment and stability; understanding, and relationship satisfaction. Also explores popular cultural constructions of marriage and intimacy and how these influence personal expectations for marital relationships. Students need not be married to take or benefit from this course. Prereq: CMN 457, or permission. Writing intensive. 4 cr.

CA 539. Communicating in Families
Examines the role of communication in the creation, maintenance, and transformation of family systems. Focus on how meanings of "family" are constructed through familial and popular discourses, and the consequences these communication practices have for lived experience. Prereq: CMN 457 or permission. 4 cr.

CA 550. Special Topics in Communication Organization, History, and Policy
New or specialized topics in the organization, history, and policy of communication practices not covered in regular course offerings. Topics vary; descriptions of course content and any prerequisites are available during preregistration. May be repeated for a maximum of 12 credits if topics differ. Prereq: contingent on topic. 1 to 4 cr.

CA 600. Research Methods in Media
Qualitative research practices for the study of mass communication. Tools for investigating the production contexts of media institutions, the cultural and ideological meanings of media texts, and the social dimensions of media consumption in home and family. Emphasis on how to review literature, develop a research question, define a unit of analysis, select and apply method, interpret data, and draw conclusions grounded in theory. Prereq: any two courses from both areas A and B for which CMN 455 is prerequisite or permission. Writing intensive. 4 cr.

CA 601. Exploring Relationships
Critically examines the myriad ways qualitative researchers approach the study of interpersonal communication. With an emphasis on the artistic practice of Belk, the course considers the process of research design, the relationship between researcher and researched, the moral and ethical aspects of research, issues of representation and audience, and evaluation strategies. Students design, conduct, and present original qualitative research projects. Prereq: any two courses from both areas A and B for which CMN 457 is prerequisite or permission. Writing intensive. 4 cr.

CA 610. Communication Technologies and Culture
The role of communication technologies in shaping cultural meanings and human consciousness. Covers the work of Innis, McLuhan, Ong, Postman, Carey and others to understand the historical development of shifting communication technologies and patterns of culture from orality to computer communication. Also explores the dynamic between mass culture and subcultural appropriations of media forms and content. Prereq: any two courses from both areas A and B for which CMN 455 is prerequisite or permission. Writing intensive. 4 cr.

CA 611. Theories of Relational Communication
Critically examines a variety of theories which seek to explain the dynamics of interpersonal relationships including performance theory, social construction theory, systems theory, feminist theory, and narrative theory. Prereq: any two courses from both areas A and B for which CMN 457 is prerequisite or permission. Writing intensive. 4 cr.

CA 612. Narrative
Considers the ways humans make sense of experience through the stories they construct in particular relational, cultural, and historical contexts. Explores a variety of topics including narrative conventions, canonical stories, subjectivity and reflexivity, the relationship between story and audience, space and time, memory and imagination, and narrative truth. Each student will conduct an original narrative research project. Prereq: any two courses from both areas A and B for which CMN 457 is prerequisite or permission. Writing intensive. 4 cr.

CA 614. Communication and Power
Examines the concept of power—how we conceive of power, how we enact power, and the effects of power in our interpersonal relationships. Using a variety of theoretical approaches such as relational theory, feminist theory, and social constructionism, we will consider the idea that the expression of power is an act of self-definition, that power resides in the ability to define one's reality while identifying and choosing courses of action, and that disempowerment is the end result of the loss of freedom of action. Prereq: CMN 457 and any two courses from areas A and B for which CMN 457 is a prerequisite. Writing intensive. 4 cr.

CA 615. Film History/Theory and Method
Intensive study of philosophical, rhetorical, and methodological issues in film history research. Examines a series of selected historical problems in the areas of social, aesthetic, industrial, and technological film history up to 1948 and reviews existing historiography on these problems. Focus is on original student research. Prereq: any two courses from both areas A and B for which CMN 455 is prerequisite or permission. Writing intensive. 4 cr.

CA 618. Documentary
Exploration of the historical development, ethics, funding, sociocultural significance, and communication strategies of documentary film and video. May focus on a particular genre or genres. Prereq: any two courses from both areas A and B for which CMN 455 is prerequisite or permission. Writing intensive. 4 cr.

CA 720. Seminar
Intensive readings and research course in a highly focused area of study. Topics vary. Descriptions of course content and any prerequisites are available during preregistration. May be repeated for credit to a maximum of 12 credits if topics differ. Prereq: contingent on topic. Writing intensive. 4 cr.

CA 795. Independent Study
Advanced individual study under the direction of a faculty member. Content area and research project to be developed in consultation with faculty supervisor. Prereq: permission. May be repeated for up to 8 credits, with 4 credits maximum accepted toward satisfaction of requirements for the CA major. 1 to 4 cr.
Computer Information Systems (CIS)

(For program description, see page 135.)

CIS 405. Introduction to Internet and Web Authoring
The fundamental technologies, protocols, and practices that make up the Internet. The Internet as a global information system that has transformed the current business environment. Additional topics include: Internet structure; applications; business uses; legal and ethical issues introduced by networked computers such as privacy, fraud, and security. A significant portion of the course covers Web authoring procedures and languages. Students will complete CS 505. Credit cannot be earned for CS 405. 4 cr.

CIS 411. Introduction to Computer Applications
An introduction to computer technology, specifically microcomputer systems. Emphasis is on 1) using computers to manage information for personal and professional applications and 2) the impact of computer information technology on today's society. Software applications used include word processing, spreadsheets, database, and graphics. Independent lab activities are a major part of the course content. Prerequisite computer experience is required. No credit if credit was received for CS 405. 4 cr.

CIS 425. Introduction to Computer Programming
An introduction to computer programming and problem solving. Introduces the programming process and algorithm development. Students learn the Visual Basic programming environment. Emphasis is on Graphical User Interface issues and their relation to sub-programs. Assignments are drawn from applications in a wide range of business contexts. No credit for students who have completed CS 503. 4 cr.

CIS 510. Fundamentals of Computer Information Systems
Investigates the role and impact of computer applications on computer information systems in general and specifically as applied to business requirements. Surveys the components of a computer information system; explores computer information systems in areas such as manufacturing, medicine, education, and government; discusses the issues of computerizing information resources. Directs attention to computer information systems in business and identifies the need for and function of formal systems development methodologies. Prerequisite: CIS 411 or equivalent. Writing intensive. 4 cr.

CIS 515. Multimedia: Introduction and Applications
Examines the history and underlying theory behind computer integration of text, sound, video, and graphics. Topics include: hardware and software requirements, design criteria, analysis of current hypertext, and multimedia applications in education and business. Students gain practical experience in developing multimedia applications on the Macintosh platform. 4 cr.

CIS 520. Database Design and Development
Students will develop a database application using the relational model and DBMS. Special emphasis in understanding the steps involved in designing a database is placed on the design and implementation of the database. The design implementation starts from the conceptual design to the implementation of a database schema and user interfaces to the database. Students will use a commercial database management system, the database query language SQL. Considerations for database maintenance and security, relational database design principles, and current trends in object oriented databases and eCommerce applications. Prerequisite: CIS 510. 4 cr.

CIS 542. Operating System Applications
Introduction to operating system concepts with relevant lab experiences. Topics include the goals and objectives of operating systems; the management of memory, processing, files, and resources; and a survey of current operating components. Students will understand and apply basic operating system concepts and principles, learn an operating system in some detail, appreciate the design considerations involved in O/S development. Prerequisite: CIS 411, CIS 510, or permission. 4 cr.

CIS 550. Networking Computers
Explores the fundamentals of data communications and networking requirements for an organization, including the standard layers of network organization; network technologies; and architectures and protocols for WAN, LAN, and Internet systems. Includes issues of security, design, management, and future developments, particularly in a business environment. Knowledge of computer hardware and operating systems is required. Prerequisite: CIS 510, CIS 542, or equivalent. 4 cr.

CIS 560. Computer Law and Ethics
Examines the ethical and legal issues that face a computer professional. Surveys ethical theories and moral problems related to information technology. Emphasis stressed on students ability to take a personal point of view on computer issues based on sound ethical principles and consider the impact of such views on co-workers, employers, and society in general. Topics also include: major social issues involving computerization such as intellectual property, privacy, computer reliability, and security; current U.S. and international laws concerning computer use and network usage. Case study analysis is a major component in course delivery. Prerequisite: CIS 510 or permission. Writing intensive. 4 cr.

CIS 570. Web Applications Development
This course provides experience in design and coding of interactive business web sites. Students learn planning and design issues for an organization's application. Course covers advanced XHTML, CSS implementation, JavaScript, ASP.NET, web tools for electronic commerce, options for adding security, and electronic payment to a web site. Students will create and manage an application on a web server. Prerequisite: CIS 405, CIS 425, CIS 510, or relevant experience and permission of the instructor. 4 cr.

CIS 599. Special Topics
Topics covered will vary depending on contemporary computer topics, programmatic need, availability and expertise of faculty. Barraging duplication of subject, may be repeated for credit. 1 to 4 cr.

CIS 610. System Analysis and Design
Addresses procedures to analyze, evaluate, and articulate requirements for an information system to accomplish project goals. Implementing a new information system, or enhancing an existing system, requires a formalized process to study an organization's needs; gather and analyze appropriate data; and report on existing systems, new systems requirements, and project priorities. The class will survey tools and techniques used in the analysis and design phases; emphasize documentation and procedures; and research trends in modeling and design software. Communication, group interaction, interviewing, and presentation skills are stressed to effectively articulate the analysis and design proposals. Open to majors who have completed Level 1 and Level 2 coursework. Writing intensive. 4 cr.

CIS 620. Network Administration and Maintenance
Develops the theory of networks through practical application of administering and maintaining a LAN. Includes the routine tasks of a network administrator using a common network operating system. Routine tasks include: setup directory services, network access privileges, the network services, understand and implement network security, perform routine maintenance, and practice troubleshooting techniques. Prerequisite: Majors must complete Level 1 and Level 2 requirements, or permission. 4 cr.

CIS 630. Application Programming Using JAVA
Students apply the basic concepts and techniques of object-oriented programming to an information processing application. The course covers basic data structures such as lists, stacks, and queues. Control structures, file manipulation, recursion and an introduction to graphic user interface design are covered and applied to programming business applications. Introduces students to object-oriented design and analysis. Good programming style is stressed. Significant out of class programming is required. Prerequisite: Majors must complete Level 1 and Level 2 requirements, or permission. 4 cr.

CIS 650. System Implementation with DBMS
This course provides practical experience in developing a detailed application for a subsystem of a computer information system. Students will implement a physical and logical design for the application using a DBMS. Topics include the conceptual, physical, and logical data models, design, and project management tools. Students will specify the logical design for output, input, processing of the database as well as implement and evaluate the database application and will identify a security and maintenance plan. Emphasis will be on the implementation process, software tools, and development team through the completion of a computer information system. Prerequisite: Majors must complete Level 1 and Level 2 requirements, including CIS 520, CIS 610, or permission. 4 cr.

CIS 680. Internship
Provides field-based learning opportunity through placement in a computer information system environment. Students will gain practical computer experience in a business or non-profit organization. Under the direction of a faculty adviser and workplace supervisor, the student is expected to contribute to the work of the organization. Students will create a portfolio of their professional activities. May be repeated for a maximum of 8 credits. Prerequisite: Majors must complete Level 1 and Level 2 requirements, or permission. 4 cr.
Economics-UNHM (ECN)

ECN 411. Introduction to Macroeconomic Principles
Studies how an economy functions. Develops measures and theories of economic performance to study such issues as unemployment, inflation, international trade and finance, and the level of national production. Examines government policies designed to correct for unemployment and inflation with close attention to the use of fiscal and monetary policies in the U.S. No credit for students who have received credit for ECON 401. 4 cr.

ECN 411W. Introduction to Macroeconomic Principles
Studies how an economy functions. Develops measures and theories of economic performance to study such issues as unemployment, inflation, international trade and finance, and the level of national production. Examines government policies designed to correct for unemployment and inflation with close attention to the use of fiscal and monetary policies in the U.S. No credit for students who have received credit for ECON 401. Writing intensive. 4 cr.

ECN 412. Introduction to Microeconomic Principles
Studies the behavior and interaction of fundamental decision-making units in an economy, especially consumers and business firms. Applies such economic principles as scarcity, supply and demand, and elasticity to a variety of social issues. Topics include the resource allocation problems of households and business firms, economic theories of social problems (such as crime, divorce, and discrimination), and the economic implications of government policies affecting the environment, the workplace, and industrial organization. No credit for students who have received credit for ECON 402. 4 cr.

ECN 412W. Introduction to Microeconomic Principles
Studies the behavior and interaction of fundamental decision-making units in an economy, especially consumers and business firms. Applies such economic principles as scarcity, supply and demand, and elasticity to a variety of social issues. Topics include the resource allocation problems of households and business firms, economic theories of social problems (such as crime, divorce, and discrimination), and the economic implications of government policies affecting the environment, the workplace, and industrial organization. No credit for students who have received credit for ECON 402. Writing intensive. 4 cr.

ECN 444. Power
What is "power"? How does it originate and influence events? Are there, or should there be, limits to power? How does power (or powerlessness) manifest itself within your life and community? This semester we will explore the concept of "power", including its sources, deployment and effects, using a variety of sources, methods, and disciplinary perspectives. To raise and address questions about power, we will carefully read, view, discuss and listen to primary source material related to our topic including texts, film, art and music. Course content includes the perspective of philosophers (Friedrich Nietzsche, Thomas Hobbes), dramatists (Samuel Beckett, Christopher Marlowe) scientists (Rene Descartes, Albert Einstein), essayists (Ralph Waldo Emerson), autoethnographers (Carolina Maria DeJesus), as well as the work of historians, economists, psychologists, and scholars working in the fields of communication and gender studies. In addition students will design a service learning project(s) to research aspects of power and/or powerlessness within their life and community. Writing intensive. 4 cr.

ECN 625. Regulation of Business
Examines the impact of governmental regulatory agencies and regulatory legislation on the operation of business in the United States. Topics include: the theory of regulation; the regulation of natural monopoly; antitrust economics; deregulation; social regulation, and interaction with regulatory agencies. Prereq: ADM 400, ECN 412. Not open to first year students except with instructor's permission. 4 cr.

ECN 635. Money, Banking and Macroeconomic Activity
A study of the financial sector of the economy including commercial banks, thrifts, and other depositary institutions. Examines the meaning and determinants of the money supply, credit and interest rates. Close attention paid to the role of the Federal Reserve and the economic effects of its monetary policy. Prereq: ECON 411, ECN 412. 4 cr.

ECN 640. Business Law and Economics
A study of the legal environment of business. Emphasis is on using economic analysis to examine laws of property, contract, and tort affecting business. Includes the ethical foundations of law and ethical issues involving business. Specific topics may include commercial free speech, white collar crime and managerial responsibility, product liability, cyberlaw, copyright, trademark and patent law. Prereq: ADM 400, ECN 412, and sophomore standing or permission of the instructor. Writing intensive. 4 cr.

ECN 650. Economics for Managers
Examines how economic principles can be applied to resource allocation problems confronted by managers in a variety of industry settings. Emphasis is on both theory and application. Topics include cost analysis, production decisions, and pricing policies of business managers within perfectly competitive, monopolistic, oligopolistic, and monopolistically competitive environments. Prereq: ADM 400, ECN 412 and sophomore standing or permission of instructor. 4 cr.

Engineering Technology (ET)

ET 601. Data Structures and Data Bases
A brief review of fundamental container classes; stacks, queues and link lists followed by more advanced data structures and concepts using search algorithms, iterators, and efficiency indicators. The second part of the course will include the development and use of relational databases using a commercial database engine. Java console applications and minimal Graphic User Interface applications will be used throughout the course to develop and test concepts. 4 cr.

ET 625. Technical Communications
Designed to improve students' capabilities to prepare and present technical information in written and oral form and through electronic means. ET majors should take this course early in their program of study so that proficiencies developed can be utilized in later courses. Writing intensive. 4 cr.

ET 630. Analytical Methods in Engineering Technology
Review of college-level mathematics including differential and integral calculus with applications and advanced topics, e.g., Fourier analysis, Laplace transform technique, and probability and statistics. Prereq: engineering technology majors only. 3 cr.

ET 639. Heating, Ventilation and Air Conditioning I
First in a two course sequence designed to familiarize the student with the design and operation of fluid thermal systems with specific applications in the heating, ventilating, and air conditioning of occupied spaces and some reference to industrial process control. Prereq: thermodynamics, calculus, or permission. Lab. Special fee. 4 cr.

ET 640. Heating, Ventilation and Air Conditioning II
Second in a two course series designed to acquaint the student with the fundamentals of fluid thermal system design with specific topics in solar loads on buildings, ventilation system requirements, pump and fan selection, piping and duct system design, and an introduction to controls. Prereq: ET 639 or permission. Lab. Special fee. 4 cr.

ET 641. Production Systems
Market forecasting; waiting line theory; manufacturing inventories and their control; production scheduling; quality control. Prereq: differential and integral calculus. 4 cr.

ET 644. Mechanical Engineering Technology Concepts in Analysis and Design
Dynamics, kinetics, work and energy, fluids, heat transfer, application of these concepts to problems in mechanical design. Prereq: strength of materials and dynamics and ET 637. 4 cr.

ET 647. Advanced Perspectives on Programming
Several programming languages will be selected for study and analysis. Students will gain knowledge regarding the languages studied and conduct analysis related to comparisons and divergence in capabilities. Prereq: intermediate programming skills in three or more programming languages. Major suggested languages of interest are: Java, C++, Visual Basic, Visual C++ Windows, Visual Basic.Net and C# or permission. 4 cr.

ET 667. Graphics and Animation
The fields of graphics and animation are critical to programming applications. Advanced display techniques of information are critical to the success of many programmed applications. Current technology will be used in intensive hands-on projects. Prereq: ET 601 or intermediate programming skills in two or more of the following languages: Java, C++, Visual Basic, Visual C++ Windows, Visual Basic.Net and C# as well as intermediate level skills in data structures or by permission. 4 cr.

ET 671. Digital Systems
Digital systems design and application using TTL and CMOS devices, design of systems, and interfacing. Digital design project required. Prereq: introductory digital design. Special fee. Lab. 4 cr.

ET 674. Control Systems and Components
Topics include linear systems analysis, the Laplace transform and its properties, controllers, root locus technique, transient response analysis, first- and second-order systems, error analysis, and control system design. Prereq: differential and integral calculus. Lab. 4 cr.
ET 675. Electrical Technology
Electrical circuits: DC and AC; network analysis, power factors, transformers, power supplies. Electronic circuits—diodes, transistors and operational amplifiers. Digital circuits and introduction to computer-aided engineering. Prereq: differential and integral calculus. Lab. 4 cr.

ET 677. Analog Systems

ET 680. Communications and Fields
Topics include Fourier series analysis; the Fourier transform and its properties; convolution; correlation including PN sequences; modulation theory; encoding and decoding of digital data (NRZ-M, NRZ-S, RZ, Biphasic-L, and Manchester); antennas and antenna pattern; Radar Range Equation; and an introduction to information theory. Prereq: differential and integral calculus. Lab. 4 cr.

ET 695. Independent Study
Individual reading, writing, or laboratory work carried out under the tutelage of a faculty member. Prereq: approval of the adviser. 1 to 4 cr.

ET 696. Topics in Mechanical Engineering
New or specialized courses not covered in regular course offerings. Prereq: permission. May be repeated to a maximum of 4 credits. 1 to 4 cr.

ET 697. Topics in Electrical Engineering Technology
New or specialized courses not covered in regular course offerings. Prereq: permission. May be repeated to a maximum of 4 credits. 1 to 4 cr.

ET 706. Internship
On-the-job skill development through fieldwork in industry. Normally, supervision is provided by a qualified individual in the organization with consultation by a faculty sponsor. Written report required. Internships may be part or full time, with course credits assigned accordingly. May be repeated to a maximum of 4 credits. Credit/No Credit. 1 to 4 cr.

ET 707. Object Oriented Design and Documentation
Current design techniques and strategies, including State Transition Diagrams (STD) and Unified Modeling Language (UML), provide the core of the course. Case studies of large programming projects will be developed. Group programming projects will be completed based upon case studies. Prereq: intermediate programming skills in one or more of the following OOP languages: Java, C++, Visual C++ Windows, Visual Basic.Net and C# or by permission. 4 cr.

ET 717. Network Security
The technical, operational, and managerial issues of computer systems and network security in an operational environment. Addresses the threats to computer security including schemes for breaking security, and techniques for detecting and preventing security violations. Emphasis on instituting safeguards, examining different types of security systems, and applying the appropriate level of security for the perceived risk. Prereq: Java programming. 4 cr.

ET 733. Business Organization and Law
Corporations; proprietorships; product liability; contracts; federal agencies; commercial paper; conditions of employment; business ethics; bankruptcy; U.C.C. Special fee. Writing intensive. 4 cr.

ET 734. Economics of Business Activities
Elementary financial accounting; compound interest and time value of money; sources of capital; cost estimating; depreciation; risk and insurance; personal finance. Prereq: differential and integral calculus. Special fee. 4 cr.

ET 737. Web Server Databases
Multiple tiered database and commercial databases are the focus of study. Practical application programs provide hands-on experiences. Prereq: ET 627 or by permission. 4 cr.

ET 745. Instrumentation
Statistics of experimentation; quantity standards and measurement; design of experiments; use of laboratory gear including dynamometer; field trips. Prereq: differential and integral calculus. ET 644 or equivalent. Lab. 4 cr.

ET 747. User Interface Design
Standards in user interface design of programs applied to practical programming applications. Consistency in look and feel often forms the core of software certification requirements. Prereq: intermediate Graphic User Interface programming skills in one or more of the following languages: Java, Visual Basic, Visual C++ Windows, Visual Basic.Net and C# or permission. 4 cr.

ET 751. Mechanical Engineering Technology Project
Students are required to find solutions to actual technological problems in design, fabrication, and testing as posed by industry. Students define the problem, prepare a budget, and work with the client company to research, design, build, and test the software and/or hardware needed. Prereq: senior standing in E.T. A year-long course: 4 credits per semester; an IA grade (continuous course) given at the end of first semester. Withdrawal from course results in loss of credit. 4 or 8 cr.

ET 762. Illumination Engineering
Radiation; spectra, wave, and particle nature of light; physics of light production, light sources and circuits, luminaries; science of seeing, color theory, control of light, measurements, light and health, lighting calculations. Prereq: MATH 426, PHYS 408 or equivalent. Lab. 4 cr.

ET 763. Lighting and Design Applications
Lighting design process, modeling, interior and exterior lighting calculation and design, flux transfer, form and configuration factors, lighting quality and aesthetics, daylighting calculations, lighting economics, lighting power and energy analysis, selected applications of light in interior and exterior spaces. Prereq: ET 762 or equivalent. 2 or 4 cr.

ET 777. Advanced Distributed Programming Trends
Distributed applications use a network or the Internet in a multi-tier architecture to distribute their presentation services, business logic, and data services. These applications often access many different data sources. The components contained in these applications typically participate in transactions and they can be shared by multiple users and multiple applications. Prereq: ET 647 or by permission. 4 cr.

ET 778. Advanced Electronic Design Methods
Design methods for analysis and synthesis of state-of-the-art circuits and systems, with real-world examples. A design project will be required. Laboratory work will form an important part of the course. Prereq: intro. analog and digital design. Special fee. Lab. 4 cr.

ET 787. Artificial Intelligence and Expert Systems
How to identify what an expert system is, and what an artificially intelligent system would be, if AI (artificial intelligence) actually existed beyond theory. Course explores some of the pitfalls that have plagued the AI community, such as why parallel processing has not provided the solution to bring theory to reality. Includes history behind AI, including connections to the human brain. Students create a mini expert system. Prereq: senior standing or by permission. 4 cr.

ET 788. Introduction to Digital Signal Processing
This course will deal with the topics of spectral representation of periodic and non-periodic analog signals followed by discrete sampling and aliasing and how it relates to Nyquist sampling theorem. The z-transform will be introduced as the required mathematical tool along with an introduction to MATLAB and its associated DSP tool box. Spectral analysis of digital signal will be accomplished using these tools. Convolution and digital filtering will also be covered. Prereq: ET 680 Communications and Fields or equivalent. 4 cr.

ET 790. Microcomputer Technology
Microcomputer systems design, including assembly language, interfacing, processor timing and loading, and interprocessor communication via local area networks. Hardware, software, and architecture of both Intel 80X86 and Motorola 68XX0 microprocessors. Microcomputer applications with emphasis on lab work using Motorola HC11 microcontroller. Prereq: ET 671. Special fee. Lab. 4 cr.

ET 791. Electrical Engineering Technology Project
Students are required to find solutions to actual technological problems in design, fabrication, and testing, as posed by industry. Students define the problem, prepare a budget, and work with the client company to research, design, build, and test the software and/or hardware needed. Prereq: senior standing in E.T. A special fee. A year-long course: an IA grade (continuous course) given at end of first semester. Withdrawal from course results in loss of credit. 4 or 8 cr.

English (ENG, ENGL)
(For program description, see page 136.)

ENG 301. Introduction to College Composition and Reading
Introduces students to academic standards of writing and reading at the college level through a variety of reading and writing tasks utilizing reflection, review and revision. Designed as a preparatory course for ENGL 401. Students are required to meet individually with instructors outside of class. May not be taken for credit toward a bachelor's degree. Special fee. 4 cr.

ENGL 400. English as a Second Language
Improves the competence of foreign students in listening comprehension, speaking, reading, and writing. Recommended as preparation for ENGL 401. May be repeated up to a total of 16 cr. Writing intensive. Special fee. Cr/F. 1-16 cr.
ENGL 401. Freshman English
Training to write more skillfully and to read with more appreciation and discernment. Frequent individual conferences for every student. Special fee. Writing intensive. 4 cr.

ENGL 401A. Freshman English for English as a Second Language Students
A special section of Freshman English for students whose native language is not English. Training to write more skillfully and to read with more appreciation and discernment, with special attention to the problems of non-native speakers of English. Supplemental work on listening and speaking as necessary. Frequent individual conferences for every student. Students may not take both ENGL 401 and 401A for credit. Special fee. Writing intensive. 4 cr.

ENGL 419. Introduction to Critical Analysis
Critical analysis of fiction, poetry, and drama. Frequent short papers. This course, or 529, is a prerequisite with a minimum grade of C for those intending to declare an English major. Writing intensive. 4 cr.

ENGL 500. Writing about Reading: Writing about Nonfiction
Emphasis on close reading of a variety of nonfiction sources and on intensive writing to develop interpretive skills. Prereq: ENGL 401 or permission. Special fee. Writing intensive. 4 cr.

ENGL 501. Introduction to Creative Nonfiction
A writing course that explores types of creative nonfiction such as nature writing, the profile, the memoir, and the personal essay. Extensive reading of contemporary authors to study the sources and techniques used in creative nonfiction. Regular papers, conferences, and workshops. Special fee. Writing intensive. 4 cr.

ENGL 503. Persuasive Writing
Writing of all types of persuasive nonfiction prose, including argumentative essays and position papers. Special attention to argumentative structures and analysis of audiences. Weekly papers of varying lengths and formats, frequent conferences. Special fee. Writing intensive. 4 cr.

ENGL 511. Major Writers in English
In-depth study and discussion of a few American and/or British writers. Topics and approaches vary depending on instructors. Writing intensive. 4 cr.

ENGL 513, 514. Survey of British Literature
Selected works in poetry and prose considered in chronological order and historical context. Attention to the works and to the ideas and tastes of their periods. 513: Bunyan through 18th Century. 514: 1800 to the present. Writing intensive. 4 cr.

ENGL 515. Survey of American Literature
From the beginning of American literature to the Civil War. For non-English majors ENGL 515 meets the group 4 requirement. Writing intensive. 4 cr.

ENGL 516. Survey of American Literature
From the Civil War to the present. Writing intensive. 4 cr.

ENGL 517. Introduction to African American Literature and Culture
An introduction to African American literature in the context of a variety of cultural perspectives. Course topics may include: major writers, genres, historical periods, Harlem Renaissance, Black Arts Movement, fine and folk arts, religion, music, and film. (Also offered as AMST 502.) Writing intensive. 4 cr.

ENGL 521. The Nature Writers
Fiction, poetry, and nonfiction books on the natural environment. Such books as Thoreau's Walden, or Maine Woods, Leopold's Sand County Almanac, Bosten's Outermost House, Dillard's Pilgrim at Tinker Creek—books by naturalists who observe nature vividly and knowingly and who write out of their concern for the environment. Writing intensive. 4 cr.

ENGL 595. Literary Topics:
Various faculty members investigate topics of special interest at a level appropriate for non-majors. Past topics have included Irish literature, animals in literature, and literature of the Vietnam War. See department for details of current offerings. Writing intensive. 1-4 cr.

ENGL 608. Arts and American Society:
Women Writers & Artists 1850-Present
Team-taught course studying the impact of gender definitions on the lives and works of selected American artists. Considers lesser-known figures such as Fannie Fern, Lilly Martin Spencer, and Mary Hallock Foote as well as better-known artists such as Willa Cather and Georgia O'Keeffe. Prereq: permission or one of the following: WS 401, HIST 566, ENGL 585, 586, 685, 785, or a 600-level art history course. (Also offered as ARTS 608, HIST 608, and HUMA 608.) Writing intensive. 4 cr.

ENGL 627, 628. Writing Poetry
Workshop in the fundamental techniques of poetry writing. Class discussion and criticism of poems by students. Individual conferences with instructor. Prereq: ENGL 501 or equivalent. Written permission of instructor required for registration. May be repeated for credit with the approval of the department chairperson. Special fee. Writing intensive. 4 cr.

ENGL 632. Fiction
Modern novels and/or short stories. The way in which fiction communicates its meanings; the tools and methods at the fiction writer's disposal, primarily as they function in individual works. See course descriptions available in department office for further information. (Not offered each semester.) Writing intensive. 4 cr.

ENGL 650. Studies in American Literature and Culture
Special topics in American studies, varying from year to year. (Not offered every year.) Writing intensive. 4 cr.

ENGL 657. Shakespeare
Ten major plays representative of the main periods of Shakespeare's career and the main types of drama which he wrote (tragedy, comedy, history). Live and filmed performances included as available. Restricted to undergraduates and designed for both English majors and students majoring in other fields. Writing intensive. 4 cr.

ENGL 685. Women's Literary Traditions
Intensive study of themes, topics, and techniques in women's literature. Topics vary from year to year. Writing intensive. 4 cr.

ENGL 693, 694. Special Topics in Literature
A) Old English Literature; B) Medieval Literature; C) 16th Century; D) 17th Century; E) 18th Century; F) English Romantic Period; G) Victorian Period; H) 20th Century; I) Drama; J) Novel; K) Poetry; L) Nonfiction; M) American Literature; N) A Literary Problem; O) Literature of the Renaissance. The precise topics and methods of each section vary. Barring duplication of subject, course may be repeated for credit. For details, see course descriptions available in the English department. (Not offered every year.) Writing intensive. 4 cr.

ENGL 710. Teaching Writing
Introduction to various methods of teaching writing. Combines a review of theories, methods, and texts with direct observation of teaching practice. Writing intensive. 2 or 4 cr.

ENGL 716. Curriculum, Materials, and Assessments in English as a Second Language
Study of the problems in designing an effective teaching program for various types of ESL students. Competence and aptitude testing; choosing and adapting materials for ESL classes. Writing intensive. 4 cr.

ENGL 742. American Literature, 1815-1865
Fiction, nonfiction, and poetry in the period of romanticism, transcendentalism, nationalism. Individual works and cultural background. (Not offered every year.) Writing intensive. 4 cr.

ENGL 743. American Literature, 1865-1915
Fiction, nonfiction, and poetry in the period of realism, naturalism, industrialism, big money. Individual works and cultural background. Writing intensive. 4 cr.

ENGL 744. American Literature, 1915-1945
Fiction, poetry, and drama in the period of avant-garde and leftism, jazz age, and Depression. Individual works and cultural background. Writing intensive. 4 cr.

ENGL 745. Contemporary American Literature
A gathering of forms, figures, and movements since 1945. Individual works and cultural background. Writing intensive. 4 cr.

ENGL 768. Literature of the Later Eighteenth Century
Poetry, drama, fiction, letters, journals, essays, and biography from the period that culminated in the American and French Revolutions. Works by such figures as Henry Fielding, Samuel Johnson, Frances Burney, Laurence Sterne, William Blake, and Mary Wollstonecraft studied in historical context and compared to the colonial world and the continent (in translation) when appropriate. Writing intensive. 4 cr.

ENGL 771. English Victorian Period
The English Victorian Period—Fiction, nonfiction and poetry from 1832-1900. Money, Science, and Love. Authors include the Brontes, Dickens, Hardy, Wilde, Tennyson. (Not offered every year.) Writing intensive. 4 cr.

ENGL 773, 774. British Literature of the 20th Century
Poets and novelists of the modernist and postmodernist periods. 773: W. B. Yeats, James Joyce, Virginia Woolf, E. M. Forster, D. H. Lawrence, and other modernists. 774: a selection of postmodernist or contemporary writers, such as William Golding, Doris Lessing, John Fowles, Philip Larkin, Seamus Heaney, Margaret Drabble, and others. Writing intensive. 4 cr.

ENGL 791. English Grammar
Instructor: Dr. L. S. M. Language and Communication. Survey of the grammar of English (pronunciation, vocabulary, sentence structure, punctuation, dialect variation, historical change) with special attention to the distinction between descriptive and prescriptive grammar and to the problems students have with formal expository writing. Writing intensive. 4 cr.
ENGL 792. Teaching Secondary School English
Methods of teaching language, composition, and literature in grades 7-12. Required of all students in the English teaching major. Open to others with permission. Writing intensive. 4 cr.

ENGL 795. Independent Study
Open to highly qualified juniors and seniors. To be elected only with permission of the department chairperson and of the supervising faculty member or members. Barring duplication of subject, may be repeated for credit up to a maximum of 16 credits. Writing intensive. 1-16 cr.

ENGL 797, 798. Special Studies in Literature
A) Old English Literature; B) Medieval Literature; C) 16th Century; D) 17th Century; E) 18th Century; F) English Romantic Period; G) Victorian Period; H) 20th Century; I) Drama; J) Novel; K) Poetry; L) Nonfiction; M) American Literature; N) A Literary Problem; O) Literature of the Renaissance. The precise topics and methods of each section vary. Barring duplication of subject, may be repeated for credit. For details, see the course descriptions available in the English department. Writing intensive. 2-6 cr.

HIST 400. Introduction to Historical Thinking
Basic skills essential to the study of history: critical reading of historical literature, improvement of written and oral analysis of historical material, and use of library resources. Intensive study of books and documents from varying historical fields and periods. Required of history majors; open to other interested students. Writing intensive. 4 cr.

HIST 505, 506. African American History
Experiences, aspirations, and contributions of black Americans from their ethnic origins in Africa to the present American crisis in race relations; comparative study of cultures and institutions. 505: Colonial America to the Civil War. 506: Reconstruction to the present. Writing intensive. 4 cr.

HIST 511. History of New Hampshire
From pre-settlement times to the present, emphasizing the use of locally available materials and sources. 4 cr.

HIST 595. Explorations
See department listings for semester topic. 1-4 cr.

HIST 600. Advanced Explorations
See department listings for semester topic. Barring duplication of subject, may be repeated for credit. 1-4 cr.

HIST 603. The European Conquest of America
Study of the social consequences of colonization, migration, and war in America, 1500-1775. Emphasis on the interaction of British colonies with competing European cultures (French, Dutch, Portuguese, and Spanish), with Native Americans, and with African American slaves. 4 cr.

HIST 651. History of New Hampshire
From pre-settlement times to the present, emphasizing the use of locally available materials and sources. 4 cr.

HIST 654. World War I to the Present
The rise and decline of Western global domination and emergence of new states and changing societies throughout the world. 4 cr.

HIST 655. Western Civilization
The classical origins and evolution of European civilization through the Renaissance, Reformation, and voyages of discovery. The rise of Europe to global supremacy in the 19th century and its transformation in the 20th century. 4 cr.

HIST 656. 20th-Century America
World War I, European totalitarianisms, World War II, the loss of European primacy, and the search for a new Europe. 4 cr.

HIST 679 - Rights Revolution
It is all but impossible to think or talk about contemporary legal and moral controversies without invoking the idea of "rights." Yet few of us can claim a clear understanding of this pivotal concept. Historically, how have particular claims, preferences, and socio-economic interests attainted the status of publicly-recognized "rights?" Are there other ways to conceptualize and prioritize rights, other forms of "rights talk," than the ones we currently employ? History 679 takes as its point of departure the "Scientific Revolution" and the "World War II" - the "rights revolution." This development has elicited both praise and alarm, and we will examine the philosophical, moral, and political dimensions of each. 4 cr.
HUMA 620. Development of Early Christianity
Examines the emergence of Western Christianity. Explores primary literature relating to religious concepts and theological positions during the first centuries of the Church from the Pauline letters, through the period of Roman Emperor Constantine, culminating in the writings of Augustine, Bishop of Hippo. Considers both Christian and non-Christian texts and assesses the forces that helped to shape the fledgling religion. Gives special attention to social, political, and cultural influences. 4 cr.

HUMA 632. Beginning and the End of the Western World: Genesis and Revelation in Western Humanities
Genesis and Revelation examined for the bibli-views of history and time in general and then an exploration of various interpretations of this material in Western thought. After a careful reading of the texts, students examine how themes in these biblical works have influenced art and architecture, literature, science, history, and culture. Advantageous for students in English, literature, history, and religious studies as well as for individuals who want a nondocumental reading of selections from one of the most influential literary works in the West. Special fee. 4 cr.

HUMA 640. Birth of Rock and Roll
An interdisciplinary study of the cultural forces that brought the birth of rock and roll in the 1950’s. This study of pre-rock music and culture will be further enriched by art, literature, and photography which focuses on the roots of rock and roll. Writing intensive. 4 cr.

HUMA 645. American Culture and Communication Through the Life and Work of F. Scott Fitzgerald
Investigates the development of 20th Century American culture and communication through the prism of F. Scott Fitzgerald. A major writer, social observer, employee of the advertising and film industries and prominent public figure, Fitzgerald’s life and literature provide a rich context for examining various dimensions of American culture and for exploring the nature of authorship as an aspect of communication. Topics covered include: modernity, the rise of mass media, consumerism, social class, imperialism, mechanization, gender, youth culture and generational identity. Prereq: One 400- or 500-level HUMA course. 4 cr.

HUMA 660. Moral Dimensions of Economic Life
Interdisciplinary examination of the moral implications of economic decisions, practices, issues, and events from ancient and modern perspectives. Topics include morality of trade, interest, profit, entrepreneurship, corporate takeovers, poverty, and wealth. Materials include philosophical and religious works (Aristotle, St. Thomas Aquinas), drama (Shakespeare), art and literature (André Warhol, Theodore Dreiser, F. Scott Fitzgerald), economics (Adam Smith, Jacob Viner), and films (Werner Herzog). 4 cr.

HUMA 680. New England Culture: Roots and Branches
Interdisciplinary examination of the richness, variety, and significance of selected periods of New England culture using literature, history, art and photographic images, music, artifacts, and oral histories. Subjects include Native American lore, European American contributions to regional culture, New England’s literary tradition and influence on American culture. 4 cr.

HUMA 795. Study of Creativity
A study of human creativity through representative lives and works of such figures as daVinci, Einstein, Kathe Kollwitz, Bach, Dickens, and Freud. Lectures, class discussions, films, and slides supplemented by gallery tours, plays, and concerts. Open to students with a background in humanities or by permission of the instructor. Special fee. (Normally offered every other year.) Writing intensive. 4 cr.

HUMA 796. Study of Contemporary Issues
Current social and political issues with focus on recent developments in public policy, science, and business, and their impact of social values. Prereq: junior status or permission. (Normally offered every other year.) Writing intensive. 4 cr.

Nursing (NURS)
(For program description, see page 138.)

NURS 606. Seminar on Professional Nursing
The role of health professionals from historical, social, political, economic, and technological viewpoints. Individual student examinations of values, attitudes and beliefs regarding professional role in relation to current nursing theory and practice. Open to RN students only by permission. Prereq: NURS 646. Special fee. Writing intensive. 7 cr.

NURS 617. Nursing and Health Care Policy
Examination of the nature and quality of health care delivery systems and health related social programs from a nursing perspective. Critical thinking skills and strategies needed by professional nurses to participate in health care planning and health care consumer advocacy for improved health services emphasized. Prereq: for RNs with at least one year of clinical experience or permission. 3 cr.

NURS 622. Clinical Decision Making I
Emphasizes the clinical decision making process in the nursing care of individuals, families, and communities across the lifespan and from diverse backgrounds. Builds upon the theoretical foundation developed in 619, Clinical Decision Making I. Students strengthen expertise in developing clinical judgments, interventions, and outcomes evaluation. Skills practiced upon attending and processing relevant information from clinical situations. Students apply knowledge from clinical nursing courses in a variety of ways. Prereq: second-semester junior Nursing majors; NURS 619; or RN student. 4 cr.

NURS 645. Research
Focuses on enhancing the student’s ability to evaluate, read, comprehend, participate in, and apply research to the practice of nursing. RN students should take 645W. Pre- or Coreq: statistics. 645W is writing intensive. 4 cr.

NURS 655. Community Health Nursing I: Population Health
Explores role of community health nursing in health promotion, disease prevention, and long term care at the population level. Identifies population at risk and implications for aggregate level nursing care. Open to RN students only by permission. Prereq: NURS 606. Special fee. 3 cr.

NURS 656. Community Health Nursing II: Individuals, Families, and Aggregates
Explores a variety of contemporary topics relevant to community health and community health nursing.
Psychology (PSYC)

(For program description, see page 138.)

PSYC 401. Introduction to Psychology
Psychology as a behavioral science; its theoretical and applied aspects. Content includes research methods, behavioral neuroscience, sensation and perception, cognition, learning, development, personality, psychopathology, and social psychology. To experience actively the nature of psychological research students have an opportunity to participate in a variety of studies as part of a laboratory experience. 4 cr.

PSYC 402. Statistics in Psychology
Design, statistical analysis, and decision making in psychological research. Probability, hypothesis testing, and confidence intervals. Conceptualization, computation, interpretation, and typical applications for exploratory data analysis (including measures of central tendency, variability), t-tests, correlations, bivariate regression, one-way analysis of variance, and chi square. Introduction to computer methods of computation. No credit for students who have completed ADM 430; BIOL 258; PSYCH 525; HHIS 540; MATH 639; MATH 644; SOC 502. 4 cr.

PSYC 502. Research Methods in Psychology
Research design, including experimental and correlational design; internal versus external validity; measurement; writing a research report; graphic and statistical methods for summarizing data; sampling; and special problems such as experimenter effects, reactivity of measurement, and others. The use of hypothesis testing and data analysis in research. Prereq: PSYC 401 and 402. Writing intensive. 4 cr.

PSYC 511. Sensation and Perception
The study of how humans (and some other animals) sense and perceive their environment. Topics include seeing (vision), hearing (audition), tasting (gustation), smelling (olfaction), feeling (somatosensation), and the variety of state-of-the-art methods used by psychologists to study these senses. Illusions and other sensory and perceptual phenomena are treated. Prereq: PSYC 401.

PSYC 513. Cognitive Psychology
The study of human cognition, its basic concepts, methods, and major findings. Human knowledge acquisition and use. Attention; perception; memory; imagery; language; reading; problem solving; and decision making. Prereq: PSYC 401. 4 cr.

PSYC 521. Behavior Analysis
Principles derived from the experimental study of human and animal learning and their theoretical integration. Respondent and operant conditioning. Reinforcement and punishment; stimulus control; choice and preference; conditioned reinforcement. Prereq: PSYC 401. 4 cr.

PSYC 531. Psychobiology
Introduction to the behavioral neurosciences. Surveys research conducted by psychologists to learn about the biological basis of behavior: development, sensation, perception, movement, sleep, feeding, drinking, hormones, reproduction, stress, emotions, emotional disorders, learning, and memory. Prereq: PSYC 401. 4 cr.

PSYC 553. Personality
Major theories, methods of assessment, and research. Prereq: PSYC 401. 4 cr.

PSYC 561. Abnormal Behavior
Causes, diagnosis, and treatment of abnormal behavior. Implications of varying theoretical viewpoints. Prereq: PSYC 401. 4 cr.

PSYC 571. The Great Psychologists
Historical introduction to some of the great psychologists and their classic works. Group 8. 4 cr.

PSYC 581. Child Development
The developing child in the context of his/her society. Current problems in, and influences on, development of the child. Personality and cognitive development; exceptional children. Prereq: PSYC 401. 4 cr.

PSYC 582. Adult Development and Aging
A life-span developmental framework for the study of growth, decline, and stability on adult development. Developmental methods in adult development research; biological basis for aging; patterns of change and stability in diverse domains of psychological functioning, e.g., perception, cognition, intellectual performance, and personality organization. Prereq: PSYC 401. 4 cr.

PSYC 591. Special Topics in Psychology
New or specialized courses are presented under this listing. Staff present material not normally covered in regular course offerings. May repeat but not duplicate content.

PSYC 710. Visual Perception
The study of how humans (and some other animals) see. Topics include color vision, depth perception, form and pattern vision, visual learning and development, eye movements, diseases of the visual system, illusions, and other visual phenomena. Prereq: PSYC 402; 502; 531; or permission. Writing intensive. 4 cr.

PSYC 711. Sensation and Perception
Anatomy, physiology, psychophysics, and perceptual processes of the visual, auditory, gustatory, olfactory, and cutaneous senses. Topics include stimulus definition, psychophysics, sensory transduction, sensory and perceptual adaptation, neural coding of space, time, magnitude, and quality. Prereq: PSYC 402; 502; 531; or permission. Writing intensive. 4 cr.

PSYC 713. Psychology of Consciousness
This course explores questions of consciousness—What is it? How does it develop? Are infants and animals conscious? Why did consciousness evolve? Includes a review of historical background, including the ideas of James, Piaget, James, Freud, and others. Contemporary topics may include the role of language and other representational systems, blindsight, subliminal perception, priming and other implicit cognitive phenomena, hypnosis, confabulation and attribution, dreaming, multiple personality and conceptions of self and free will, from simultaneous perspectives of phenomenology, behavior, and neuroscience. Specific topics governed by class interests. Prereq: PSYC 402; 512; or 513; or permission. Writing intensive. 4 cr.

PSYC 741. Advanced Topics
Advanced material in which instructor has specialized knowledge through research and study. May be repeated for different offerings. Topics under this listing may be utilized to fulfill a major requirement in category CII. A) Psychology as a Natural Science; B) Cognition; C) Behavior Analysis; D) Biological/Sensory

PSYC 758. Health Psychology
Survey of current topics in health psychology, including: social stress and the etiology of disease; Type A and other personality factors related to health; modification of risk factors; the practitioner-patient relationship; chronic pain; and the emotional impact of life-threatening illness. Prereq: PSYC 401; 502; or permission. Writing intensive. 4 cr.

PSYC 762. Counseling
Theories of counseling; ethical considerations; professional and paraprofessional activities in a variety of work settings. Prereq: PSYC 402; 502; 553; or permission. Writing intensive. 4 cr.

PSYC 791. Advanced Topics
Advanced material in which instructor has specialized knowledge through research and study. May be repeated for different offerings. Topics under this listing may be utilized to fulfill a major requirement in category CII. A) Psychology as a Social Science; B) Social Psychology; C) Personality; D) Abnormal/Counseling; E) History of Psychology; F) Child Development; G) Adult Development.
PSYC 793. Internship
Supervised practicum in one of several cooperating New Hampshire mental health/rehabilitation facilities. Coursework knowledge applied to meaningful work and team experience. Commitment includes a negotiated number of weekly work hours and weekly seminars. Supervision by institution personnel and the instructor. A maximum of 4 credits may be applied to the psychology major. Prereq: permission; PSYC major; PSYC 402; 502; 561; additional psychology courses desirable. 4-8 cr.

PSYC 795. Independent Study
A) physiological; B) perception; C) history and theory; D) behavioral analysis; E) social; F) cognition; G) statistics and methods; H) experimental; I) personality; J) developmental; K) counseling; L) psychotherapy; M) research apprenticeship; N) teaching of psychology; O) advanced externship (content area to be determined). Arranged by the student with a psychology faculty sponsor. Learner/sponsor contract required. Minimum time commitment: three hours per credit per week. Enrollment by permission only. Prereq: PSYC 402; 502; or permission. 1-4 cr.

Sign Language Interpreting (INTR)
(For program description, see page 139.)

INTR 430. Introduction to Interpretation
A survey of traditional and contemporary perspectives on interpretation and interpreters; introduces the cognitive processes involved in interpretation and factors that influence those processes. Several models of interpretation explored. Particular attention given to interpretation as an intercultural, as well as interlingual, process. Students engage in a research project related to course content. 4 cr.

INTR 438. A Sociocultural Perspective on the Deaf Community
Introduction to the deaf community and deaf culture. Discussion of similarities to, and differences from, mainstream hearing culture. Supplemental videotapes focus on aspects of culture including deaf education, autobiographical sketches, deaf norms and values, and deaf literature and folklore. Theoretical issues of culture and linguistics applied to deaf culture, American Sign Language, and the variety of cultural perspectives of the deaf community. Students engage in a research project related to course content. Pre- or Coreq: ENGL 401. Writing intensive. 4 cr.

INTR 439. Ethics and Professional Standards for Interpreters
Seminar course using readings, theory, and discussion of hypothetical situations and role plays to explore ethical standards and dilemmas in ASL-English interpretation. Covers personal and professional values, ethics, and morality; professional principles; power, responsibility, and group dynamics; the interpreter's role; cross-cultural issues; and the decision-making process. Students engage in a research project related to course content. Prereq: INTR 430. Writing intensive. 4 cr.

INTR 539. Comparative Linguistic Analysis for Interpreters
Examines the basic similarities and differences between the linguistic structure of American Sign Language and spoken English; focuses on each language's communication functions and how they serve these functions. Students engage in a research project related to course content. Prereq: ENGL 505; Pre- or Coreq: ASL 532. 4 cr.

INTR 540. Principles and Practices of Translation
Introduction to theory and practice of translation. Students analyze pre-prepared interpretations and translations to discover how expert interpreters produce target language messages which are pragmatically equivalent to the source language messages. Particular attention paid to the form/meaning distinction. Students prepare translations from texts of their choosing. Pre- or Coreq: ASL 532. 4 cr.

INTR 599. Special Topics
Occasional offerings dependent on availability and interest of faculty. Barring duplication of subject, may be repeated for credit. 1 to 4 cr.

INTR 630. Principles and Practices of Consecutive Interpretation
Introduction to the theory and practice of consecutive interpretation. Analyzes and integrates specific subtasks of the interpreting process culminating in the performance of prepared and spontaneous consecutive interpretations. Students work with a variety of texts, language models, and settings with the goal of producing a grammatically correct target language text which is equivalent to the source language text. Prereq: INTR 540. 4 cr.

INTR 636. Principles of Simultaneous Interpretation
Introduces the theory and practice of simultaneous interpretation. Particular attention is given to processes involved in translation from consecutive to simultaneous interpreting. The advantages and limitations of both types of interpreting are compared. Students apply theoretical information to the process of simultaneous interpreting. Students engage in a research project related to course content. Prereq: INTR 630. 4 cr.

INTR 658. Deaf/Hearing Cultural Dynamics
Deaf culture and mainstream American culture compared, contrasted, and analyzed from a variety of perspectives. Cultural interactions between deaf and hearing people are examined, and students will explore potential cultural conflicts between deaf and hearing people. This course is team taught by deaf and hearing instructors, and is conducted primarily in ASL. Students also engage in a research project related to course content. Prereq: ASL 532; INTR 438. 4 cr.

INTR 732. Simultaneous Interpretation of Discussions, Speeches, and Reports
Focuses on simultaneous interpretation of group discussions, speeches, and reports. Students apply theory learned in INTR 636 to a variety of texts, language models, and settings. Students engage in a research project related to course content. Prereq: INTR 636. Writing intensive. 4 cr.

INTR 734. Field Experience and Seminar I
Gives students the opportunity to observe professional working interpreters, with some direct interpreting experience as deemed appropriate. Students integrate knowledge, theoretical understanding, and skills acquired in the interpreting program by working closely with on-site supervisors (interpreters) in addition to attending a bi-weekly seminar with the UNHM field experience coordinator. Pre- or Coreq: INTR 732. 4 cr.

INTR 735. Field Experience and Seminar II
Gives students the opportunity to gain supervised interpreting experience. Students engage in actual interpreting assignments and receive support and mentorship from a professional interpreter, enabling them to integrate knowledge, theoretical understanding, and skills acquired in the interpreting program. Students work closely with on-site supervisors (interpreters) in addition to attending a bi-weekly seminar with the UNHM field coordinator. Prereq: INTR 734. 4 cr.

INTR 798. Special Topics
Selected topics that vary by semester. Possible course topics are interpreting in educational settings, working with specific populations, or other topics of importance to interpretation. Descriptions available in departmental office during preregistration. Students engage in a research project related to course credit. Prereq: INTR 636; permission. May be repeated for credit if topics differ. 4 cr.

Independent Study (UMIS)

UMIS 599. Independent Study
Independent study with the approval and sponsorship of UNHM faculty of material not covered in regular course offerings. Barring duplication of subject, may be repeated for credit up to a maximum of 8 credits. 1 to 4 cr.

Special Topics (UMST)

UMST 500. Internship
The UNHM internship places students in a variety of business and organizational settings under the direction of a faculty adviser and workplace supervisor. Students fulfill the obligations of the workplace internship plan, as well as complete individually-designed projects of academic merit under the direction of UNH faculty. Open to matriculated students with a 2.5 GPA or better. Students must receive approval of the UNHM internship coordinator. May be taken from 1-4 elective credits per semester, to a maximum of 8 credits. Credit/Fail. 1 to 4 cr.

UMST 521. Tutor Development
This interdisciplinary course, team-taught by the Director and Assistant Director of the Learning Center, is intended to prepare undergraduates for working as peer tutors. Students will study theories of adult development, learn several approaches to tutoring in their discipline(s), and practice their tutoring and communication skills. This course may be taken for 2- or 4-credits. Cannot be repeated. Prereq: permission of instructor is required. 2 or 4 cr.

UMST 522. Tutor Development II
This interdisciplinary course, team-taught by the director and assistant director of the learning center, expands and deepens undergraduate preparation for peer tutoring. Students study theories of adult development, learn additional approaches to tutoring in their discipline(s), and practice their tutoring and communication skills. Prereq: permission of instructor. Cannot be repeated. 2 or 4 cr.

UMST 599. Special Topics
Occasional offerings dependent on availability and interest of faculty, barring duplication of subject, may be repeated for credit. 1 to 4 cr.
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Updated April, 2007
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<tr>
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<th>Title/Gender</th>
<th>University/State/Year(s)</th>
<th>Degree(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrams, Eleanor D. (1994)</td>
<td>Associate Professor of Education</td>
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<td></td>
</tr>
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<td>Barber, Heather (1993)</td>
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<tr>
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<tr>
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<tr>
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McIntosh, Edward D.

Meadows, Dennis (1988)
Director of the Institute for Policy and Social Research and Professor Emeritus of Policy Analysis; B.A., Carleton College, 1964; Ph.D., Massachusetts Institute of Technology, 1969; (1988 to 2005).

Meeker, Bonnie Sharon
Extension Specialist Emerita; B.S., Oregon State University, 1957; M.E., University of New Hampshire, 1975; (1980 to 2004).

Meeker, Loren D.

Melvin, Donald W.
Associate Dean Emeritus of the College of Engineering and Physical Sciences and Associate Professor Emeritus of Electrical and Computer Engineering; B.S., University of New Hampshire, 1955; M.E., Yale University, 1957; Ph.D., Syracuse University, 1971; (1957 to 1995).

Menge, Carleton P.
Professor Emeritus of Education; B.S., Springfield College, 1939; M.A., University of Chicago, 1940; Ph.D., ibid., 1948; (1948 to 1990).

Mennel, Robert M. (1969)
Professor Emeritus of History and the Humanities; B.A., Denison University, 1960; M.A., Ohio State University, 1965; Ph.D., ibid., 1969; (1969 to 2005).

Merritt, Richard D.
Associate Professor Emeritus of the Arts, Certificate, Rochester Institute of Technology, 1948; (1948 to 1986).

Metcal, Theodore G.
Professor Emeritus of Microbiology; B.S., Massachusetts College of Pharmacy, 1940; Ph.D., University of Kansas, 1950; (1956 to 1981).

Miller, Edmund G.
Professor Emeritus of English; A.B., Dartmouth College, 1943; M.A., Columbia University, 1947; Ph.D., ibid., 1951; (1951 to 1987).

Mills, B. Joyce
Assistant Professor Emerita of Kinesiology; B.S., Georgia State College for Women, 1949; M.S., University of Tennessee, 1958; (1967 to 1992).
Mills, Richard L.

Mitchell, James R.
Associate Professor Emeritus of Plant Biology and Extension Agronomist, Forage Crops; B.S., University of New Hampshire, 1957; M.S., Pennsylvania State University, 1960; Ph.D., ibid., 1969; (1964 to 1998).

Morrison, James D.
Professor Emeritus of Chemistry; B.S., Franklin and Marshall College, 1958; Ph.D., Northwestern University, 1963; (1965 to 1998).

Mosberg, William
Associate Professor Emeritus of Mechanical Engineering; B.S.M.E., Columbia University, 1956; M.Eng., Yale University, 1960; (1958 to 1997).

Moyer, Lynan
Professor Emeritus of Physics; B.S., University of California at Berkeley, 1949; Ph.D., Massachusetts Institute of Technology, 1953; (1957 to 1990).

Mulhern, John E., Jr.
Professor Emeritus of Physics; B.S., Oklahoma State University, 1948; M.A., Boston University, 1949; Ph.D., ibid., 1954; (1954 to 1993).

Murdoch, Joseph B.
Professor Emeritus of Electrical and Computer Engineering and Affiliate Professor of Electrical Engineering Technology; B.S., Case Western Reserve University, 1950; M.S., University of New Hampshire, 1955; Ph.D., Case Western Reserve University, 1962; (1952 to 1995).

Murphy, William F.

Murray, Frederick P.
Associate Professor Emeritus of Communication Sciences and Disorders; B.A., Stanford University, 1948; M.A., University of Southern California, 1950; Ph.D., University of Denver, 1966; (1966 to 1991).

Nahin, Paul J.
Professor Emeritus of Electrical and Computer Engineering; B.S.E.E., Stanford University, 1962; M.S.E.E., California Institute of Technology, 1963; Ph.D., University of California at Irvine, 1972; (1975 to 2004).

Nevin, John A.
Professor Emeritus of Psychology; B.E., Yale University, 1954; M.A., Columbia University, 1961; Ph.D., ibid., 1963; (1972 to 1995).

Nicoloff, Philip L.
Professor Emeritus of English; B.A., University of California at Los Angeles, 1949; M.A., Columbia University, 1952; Ph.D., ibid., 1959; (1954 to 1995).

Nielsen, Alfred Melville
Associate Professor Emeritus of Sociology; B.S., Bowling Green State University; 1942; M.A., Ohio State University, 1947; Ph.D., ibid., 1955; (1950 to 1986).

O'Connell, Lawrence W.
Associate Professor Emeritus of Political Science; B.A., University of New Hampshire, 1956; Ph.D., Syracuse University, 1968; (1966 to 1999).

O'Donnell, Dorothy C.
Associate Professor Emerita of Home Economics and Extension Specialist Emerita, Interior Design; B.S., Cornell University, 1946; M.S., University of Wisconsin at Madison, 1952; M.S., ibid., 1955; (1961 to 1980).

Olson, David P.
Professor Emeritus of Wildlife Management; B.S., University of Minnesota, 1954; M.S., University of Maine at Orono, 1958; Ph.D., University of Minnesota, 1964; (1964 to 1995).

Ossenbruggen, Paul J.
Professor Emeritus of Civil Engineering; B.C.E., Syracuse University, 1963; M.S., University of Connecticut, 1967; Ph.D., Carnegie Mellon University, 1970; (1975 to 1999).

Palmer, Stuart
Dean Emeritus of the College of Liberal Arts and Professor Emeritus of Sociology; B.A., Yale University, 1949; M.A., ibid., 1951; Ph.D., ibid., 1955; (1953 to 1996).

Parrissin, T. A.
Assistant Professor Emeritus of Mechanical Engineering Technology; B.S.M.E., University of New Hampshire, 1960; (1977 to 1998).

Patmos, Raymond M., Jr. (1972)

Pearson, David A.
Professor Emeritus of Health Management and Policy; B.S., State University of New York College at Cortland, 1956; M.P.H., University of Michigan at Ann Arbor, 1961; Ph.D., Yale University, 1970; (1989 to 2002).

Peirce, Lincoln C.
Professor Emeritus of Plant Biology and Genetics; B.S., Cornell University, 1952; Ph.D., University of Minnesota, 1958; (1964 to 1992).

Petillo, Juliette D.
Associate Professor Emerita of Nursing; B.S.N., St. Anselm College, 1961; M.S., Boston University, 1973; Ph.D., Boston College, 1993; (1973 to 1998).

Petroski, Joseph J.
Associate Professor Emeritus of Education; B.S., University of New Hampshire, 1947; M.Ed., ibid., 1952; Ed.D., Harvard University, 1960; (1966 to 1978).

Pilar, Frank L.
Professor Emeritus of Chemistry, B.S., University of Nebraska at Lincoln, 1951; M.S., ibid., 1953; Ph.D., University of Cincinnati, 1957; (1957 to 1992).

Pilowman, Faye T.

Pohl, Peter W. (1969)

Pokoski, John L.
Professor Emeritus of Electrical Engineering; B.S., St. Louis University, 1959; M.S., Arizona State University, 1965; Ph.D., Montana State University, 1967; (1967 to 2001).

Pols, Keith
Professor Emeritus of Music; B.A., San Diego State University, 1956; M.M., University of Wisconsin at Madison, 1958; Ph.D., University of California at Berkeley, 1968; (1964 to 2000).

Porter, John C.

Pratt, Leighton C.
Assistant Extension Educator Emeritus and County Extension Agent, Agriculture and County Coordinator, Coos County; B.S., University of Vermont, 1951; M.S., University of Rhode Island, 1953; (1969 to 1988).

Prince, Allan B.
Professor Emeritus of Soil and Water Science; M.S., Rutgers University, 1947; Ph.D., ibid., 1950; (1954 to 1990).

Pritchard, Hugh C.
Professor Emeritus and Reference Librarian; B.A., University of Washington, 1939; M.A., University of North Carolina at Chapel Hill, 1942; M.S., Columbia University, 1950; (1954 to 1985).

Puth, Robert C.

Rasmussen, Mary H.
Professor Emerita of Music; B.A., University of New Hampshire, 1952; M.M., University of Illinois at Urbana-Champaign, 1953; M.L.S., ibid., 1956; (1968 to 1997).

Reed, Robert C.

Ringrose, Richard C.
Professor Emeritus of Animal Science; B.S., Cornell University, 1932; Ph.D., ibid., 1936; (1942 to 1975).

Roberts, Betty Holroyd
Professor Emerita of Social Work; B.A., West Virginia University, 1953; M.S.W., ibid., 1970; Ph.D., Brandeis University, 1975; (1974 to 1991).

Roberts, Lewis, Jr.

Rogers, John E.

Rogers, Owen M.
Professor Emeritus of Plant Biology and Genetics; B.V.A., University of Massachusetts at Amherst, 1952; M.S., Cornell University, 1954; Ph.D., Pennsylvania State University, 1959; (1959 to 1995).

Romoser, George K.

Rosen, Sam
Professor Emeritus of Economics; B.A., University of Wisconsin at Madison, 1942; M.A., Harvard University, 1948; Ph.D., ibid., 1952; (1957 to 1985).
Ross, Shepley L.

Rothwell, Kenneth J.
Professor Emeritus of International Economics; B.A., University of Western Australia, 1949; M.A., ibid., 1954; Ph.D., Harvard University, 1961; (1963 to 1991).

Rouman, John C.
Professor Emeritus of Classics; B.A., Carleton College, 1950; M.A., Columbia University, 1951; Ph.D., University of Wisconsin at Madison, 1965; (1965 to 1999).

Routley, Douglas G.
Professor Emeritus of Plant Biology; B.S.A., University of British Columbia, 1952; M.S., Pennsylvania State University, 1953; Ph.D., ibid., 1957; (1957 to 1991).

Rupp, Nancy C.
Assistant Professor Emerita of Kinesiology; B.S., Sargent College, Boston University, 1950; M.A., University of Iowa, 1957; (1970 to 1991).

Samuels, Frederick
Professor Emeritus of Sociology; B.S., City College of New York, 1950; M.A., University of Hawaii, 1963; Ph.D., University of Massachusetts at Amherst, 1966; (1966 to 1993).

Sasner, John
Professor Emeritus of Zoology and Affiliate Professor of Zoology; B.A., University of New Hampshire, 1957; M.S., ibid., 1959; Ph.D., University of California at Los Angeles, 1965; (1965 to 2000).

Savage, Godfrey H.
Professor Emeritus of Mechanical and Ocean Engineering; B.S.E., Princeton University, 1950; M.B.A., Harvard University, 1954; Ph.D., Stanford University, 1970; (1965 to 1997).

Sawyer, Albert K.
Professor Emeritus of Chemistry; A.B., Colby College, 1940; M.S., University of Maine at Orono, 1947; (1949 to 1985).

Schibanoff Susan
Professor Emerita of English; B.A., Cornell University, 1966; M.A., University of California at Los Angeles, 1967; Ph.D., ibid., 1971; (1971 to 2006).

Schlobohm, Starr F.
Associate Professor Emeritus of Marketing; B.A., Ohio Wesleyan University, 1958; M.B.A., Harvard University, 1952; M.Phil., Graduate School of Business Administration, New York University, 1978; Ph.D., ibid., 1980; (1975 to 1992).

Schnee, Cecil J.
Professor Emeritus of Geology and the History of Science; A.B., Harvard University, 1943; A.M., ibid., 1949; Ph.D., Cornell University, 1954; (1954 to 1988).

Schoeder, Calvin E.

Schwarz, Marc L.
Associate Professor Emeritus of History; A.B., Bates College, 1959; M.A.T., Harvard University, 1960; Ph.D., University of California at Los Angeles, 1965; (1967 to 2006).

Schweickart, Patrocinio P
Professor Emerita of English; B.S., University of the Philippines, 1963; M.Ch.E., University of Virginia, 1965; M.A., ibid., 1969; M.A., Ohio State University, 1974; Ph.D., ibid., 1980; (1979 to 1998).

Seavey, David C.

Seidel, Alice C.
Associate Professor Emerita of Occupational Therapy; B.S., University of Wisconsin at Madison, 1963; M.P.H., University of Michigan at Ann Arbor, 1971; Ed.D., Vanderbilt University, 1994; (1976 to 2004).

Shepard, Harvey K.
Professor Emeritus of B.S., University of Illinois at Urbana-Champaign, 1960; M.S., California Institute of Technology, 1962; Ph.D., ibid., 1966; (1969 to 2006).

Shore, Carol

Shottet, John D.

Silva, J. Donald

Silverman, Robert J.
Professor Emeritus of Mathematics; S.B., University of Chicago, 1947; S.M., ibid., 1948; Ph.D., University of Illinois at Urbana-Champaign, 1952; (1962 to 1987).

Simic, Charles D.

Simpson, Robert E.
Professor Emeritus of Physics; B.S., University of Rochester, 1953; A.M., Harvard University, 1956; Ph.D., ibid., 1960; (1963 to 2002).

Sir, W. Niel

Skoglund, Winthrop C.
Professor Emeritus of Animal Science; B.S., University of New Hampshire, 1938; M.S., Pennsylvania State University, 1940; Ph.D., ibid., 1958; (1950 to 1981).

Smith, Gerald L.
Associate Professor Emeritus of Animal Science and Extension Animal Scientist; B.S., University of New Hampshire, 1948; M.S., Pennsylvania State University, 1951; (1948 to 1980).

Smith, M. Daniel

Smith, Mark R.
Professor Emeritus of English; B.A., Northwestern University, 1960; (1966 to 1999).

Smith, Samuel C.

Sorensen, David C.

Spears, Margaret W.
Associate Professor Emeritus of Nursing; B.S.N., University of Pittsburgh, 1952; M.S., University of Lowell, 1979; Ed.D., Vanderbilt University, 1985; (1981 to 1996).

Sprague, Linda G.

Sproul, Otis J.
Dean Emeritus of the College of Engineering and Physical Sciences and Professor Emeritus of Civil Engineering; B.S., University of Maine at Orono, 1952; M.S., ibid., 1957; Sc.D., Washington University, 1961; (1982 to 1995).

Stewart, James A.
Professor Emeritus of Biochemistry; B.A., St. Anselm College, 1963; Ph.D., University of Connecticut, 1967; (1968 to 2001).

Stoekling, Marion I.
Associate Extension Educator Emerita and County Extension Agent, Home Economics, Carroll County; B.S., Simmons College, 1949; M.A., University of Connecticut, 1971; (1958 to 1988).

Stone-Meadams, Deborah E.
Associate Professor Emerita of Education; B.Ed., Plymouth Teachers College, 1940; M.Ed., Boston University, 1951; Ed.D., ibid., 1971; (1962 to 1990).

Sullivan, Judith A.
Professor Emerita of Nursing; B.S., Boston University, 1962; M.S., Case Western Reserve University, 1967; Ed.D., University of Rochester, 1972; (1990 to 2006).

Sussenberger, Barbara
Associate Professor Emeritus of Occupational Therapy; B.S., Tufts University, 1961; M.S., Boston University, 1975; (1978 to 2003).

Sweet, Paul C.
Coach of Track and Cross Country and Professor Emeritus of Kinesiology; B.S., University of Illinois at Urbana-Champaign, 1923; M.S., University of Southern California, 1941; (1924 to 1970).

Szymaniko, Joseph A.

Taft, Charles K.
Professor Emeritus of Mechanical Engineering; B.A., Amherst College, 1951; B.S., Massachusetts Institute of Technology, 1953; M.S., Case Western Reserve University, 1956; Ph.D., ibid., 1960; (1967 to 1991).

Tillinghast, Edward K.
Professor Emeritus of Zoology and Affiliate Professor of Zoology; B.S., University of Rhode Island, 1955; M.S., ibid., 1959; Ph.D., Duke University, 1967; (1967 to 1999).
Tischler, Herbert
Professor Emeritus of Geology; B.S., Wayne State University, 1950; M.A., University of California at Berkeley, 1955; Ph.D., University of Michigan at Ann Arbor, 1961; (1965 to 1997).

Ulrich, Gael D.
Professor Emeritus of Chemical Engineering; B.S., University of Utah, 1959; M.S., ibid., 1962; Sc.D., Massachusetts Institute of Technology, 1964; (1970 to 1997).

Urban, Willard E., Jr.
Professor Emeritus of Biometrics; B.S., Virginia Polytechnic Institute and State University, 1958; M.S., Iowa State University, 1960; Ph.D., ibid., 1963; (1963 to 1997).

Ury, Ann D.
Associate Professor Emerita of Occupational Therapy; B.S., University of New Hampshire, 1937; B.S.F., University of New Hampshire, 1947; M.S., ibid., 1954; (1958 to 1982).

Van Osdl, Donovan H.

Verrette, Paul F.
Associate Professor Emeritus of Music; B.A., University of New Hampshire, 1952; M.A., Boston University, 1971; (1962 to 1995).

Vreeland, Robert P.
Associate Professor Emeritus of Civil Engineering; B.S., Yale University, 1932; M.S., Columbia University, 1933; M.E., Yale University, 1941; (1966 to 1977).

Wallace, Oliver P., Sr.
Professor Emeritus of Forest Resources; B.S., University of New Hampshire, 1937; B.S.F., University of Michigan at Ann Arbor, 1938; M.E., ibid., 1947; Ph.D., ibid., 1945; (1958 to 1982).

Wang, Rosemary A.
Associate Professor Emerita of Nursing; Diploma, Good Samaritan School of Nursing, Cincinnati, 1957; B.S., College of Mount St. Joseph, 1959; M.S., Boston College, 1962; Ph.D., ibid., 1982; (1971 to 1999).

Wang, Tung-Ming
Professor Emeritus of Civil Engineering; B.S., National Chiiao-Tung University, China, 1945; M.S., University of Missouri at Columbia, 1954; Ph.D., Northwestern University, 1966; (1961 to 1992).

Ward, Judith D.
Associate Professor Emerita of Occupational Therapy; B.S., University of New Hampshire, 1964; M.O.E., ibid., 1976; Ph.D., The Fielding Institute, 1997; (1972 to 2006).

Wear, Robert E.
Associate Professor Emeritus of Kinesiology; B.A., Oberlin College, 1941; M.A., University of Michigan at Ann Arbor, 1946; Ph.D., ibid., 1955; (1964 to 1986).

Weathersby, Rita

Weber, James H.
Professor Emeritus of Chemistry; B.S., Marquette University, 1959; Ph.D., Ohio State University, 1963; (1963 to 1999).

Weeks, Silas B.

Welland, Walter E.
Associate Professor Emeritus of Kinesiology; B.S., State University of New York College at Cortland, 1957; M.S., Pennsylvania State University, 1958; Ph.D., ibid., 1964; (1964 to 1996).

Wells, Otho S.
Professor Emeritus of Plant Biology and Extension Horticulturist, Vegetables; B.S., North Carolina State University, 1961; M.S., Michigan State University, 1963; Ph.D., Rutgers, The State University of New Jersey, 1966; (1966 to 1999).

Wetzel, William E., Jr.

Weyrick, Richard R.
Associate Professor Emeritus of Forest Resources; B.S., University of Minnesota, 1953; M.F., ibid., 1961; Ph.D., ibid., 1968; (1964 to 2004).

Wheeler, Charles M., Jr.
Professor Emeritus of Chemistry; B.S., West Virginia University, 1947; M.S., ibid., 1949; Ph.D., ibid., 1951; (1950 to 1983).

Wheeler, Douglas L.
Professor Emeritus of History; A.B., Dartmouth College, 1959; A.M., Boston University, 1960; Ph.D., ibid., 1965; (1965 to 2002).

White, Barbara A.
Professor Emerita of Women's Studies; A.B., Cornell University, 1964; M.A., University of Wisconsin at Madison, 1965; Ph.D., ibid., 1974; (1976 to 1999).

White, Susan O.
Professor Emerita of Political Science; A.B., Bryn Mawr College, 1958; M.A., University of Minnesota, 1966; Ph.D., ibid., 1970; (1960 to 1997).

Wicks, John D.
Professor Emeritus of Music; A.B., Harvard University, 1944; A.M., ibid., 1947; Ph.D., ibid., 1959; (1956 to 1989).

Williams, Charles H.
Associate Extension Educator Emeritus and Extension Specialist, Ornamentals; B.S., Pennsylvania State University, 1956; M.S., Michigan State University, 1967; Ph.D., University of New Hampshire, 1981; (1969 to 1998).

Willits, Robin D.
Professor Emeritus of Administration and Organization; A.B., Middlebury College, 1949; B.S., Massachusetts Institute of Technology, 1948; Ph.D., ibid., 1965; (1965 to 1990).

Wilson, John A.
Associate Professor Emeritus of Mechanical Engineering; B.S., Tufts University, 1958; M.S., Northeastern University, 1960; Ph.D., ibid., 1970; (1960 to 1999).

Wing, Barbara H.
Associate Professor Emerita of Spanish; B.A., Middlebury College, 1955; M.A.T., Harvard University, 1956; M.A., Middlebury College, 1971; Ph.D., Ohio State University, 1980; (1970 to 1996).

Wing, Henry J., Jr.
Associate Professor Emeritus of Music; B.M., Oberlin Conservatory, 1952; M.M., ibid., 1953; Ph.D., Boston University, 1966; (1970 to 1996).

Winn, Alden L.
Professor Emeritus of Electrical and Computer Engineering; B.S., University of New Hampshire, 1937; S.M., Massachusetts Institute of Technology, 1948; (1948 to 1983).

Wood, Dorothy

Wood, Stephen A.
Assistant Extension Educator Emeritus of Forest Resources, Sullivan County; B.S., University of Maine, 1949; (1971 to 1989).

Wright, Paul A.
Professor Emeritus of Zoology; B.S., Bates College, 1941; A.M., Harvard University, 1942; Ph.D., ibid., 1944; (1958 to 1983).

Wrightsmans, Dwayne E.
Professor Emeritus of Finance; B.S., Manchester College, 1958; M.B.A., Indiana University at Bloomington, 1959; Ph.D., Michigan State University, 1964; (1964 to 1993).

Yamamoto, Yutaka
Associate Professor Emeritus of Philosophy; B.S., University of California at Berkeley, 1957; M.A., University of Michigan at Ann Arbor, 1967; Ph.D., ibid., 1973; (1973 to 1997).

Yount, John A.

Zabarsky, Melvin J.

Zaso, Gus C.
Associate Professor Emeritus of Tourism Planning and Development; A.B., Syracuse University, 1957; M.A., Central Michigan University, 1962; Re.D., Indiana University at Bloomington, 1965; (1970 to 1997).

Zsigany, Robert M.
Professor Emeritus of Microbiology and Genetics; A.B., Miami University, Ohio, 1961; M.S., Georgetown University, 1967; Ph.D., ibid., 1969; (1970 to 2004).
## Enrollment Statistics—Fall Semester

### UNH Durham

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<tr>
<td><strong>Freshman</strong></td>
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<td>1076/1529</td>
<td>1232/1587</td>
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<td>1144/1553</td>
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<td><strong>Junior</strong></td>
<td>1022/1421</td>
<td>1090/1453</td>
<td>1078/1499</td>
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<tr>
<td><strong>Senior</strong></td>
<td>1111/1558</td>
<td>1146/1479</td>
<td>1106/1503</td>
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<td><strong>Total</strong></td>
<td>3363/4723</td>
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<td><strong>1st Year—T.S.A.S.</strong></td>
<td>183/133</td>
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<tr>
<td><strong>2nd Year—T.S.A.S.</strong></td>
<td>78/58</td>
<td>94/65</td>
<td>110/76</td>
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<td><strong>D.C.E.—A.A.</strong></td>
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<td><strong>Graduate—Master’s</strong></td>
<td>737/1134</td>
<td>731/1212</td>
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<td><strong>Graduate—Doctoral</strong></td>
<td>242/211</td>
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<td><strong>Total Degree Candidates</strong></td>
<td>5654/7607</td>
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<td><strong>Continuing Education Credit</strong></td>
<td>454/716</td>
<td>399/657</td>
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### Baccalaureate Curricula

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<td>Freshman</td>
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<td>Junior</td>
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<td><strong>Engineering and Physical Sciences</strong></td>
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<td>Junior</td>
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<td>Senior</td>
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<td>Freshman</td>
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<td>Junior</td>
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<td>Senior</td>
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<td>455</td>
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<td><strong>Total</strong></td>
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<td>1619</td>
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### UNH Manchester

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<td><strong>Associate</strong></td>
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<td>108/118</td>
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<td><strong>Baccalaureate</strong></td>
<td>204/364</td>
<td>224/342</td>
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<td>255/344</td>
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<tr>
<td><strong>Total Degree Candidates</strong></td>
<td>312/490</td>
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<td>153/270</td>
<td>145/188</td>
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*Master's counts include Certificate of Advanced Graduate Study.*
Semester I

September 3, Monday
Labor Day, University Holiday

September 4, Tuesday
Classes begin

September 13, Thursday
Rosh Hashanah*

September 14, Friday
Last day to withdraw, to drop to part-time, or to reduce part-time load and qualify for tuition refund based on 3/4 difference in tuition

September 21, Friday
Last day to add courses or Honors designation
Last day to drop courses or change to Audit without $25 late fee
Last day to choose Pass/Fail grading option

September 22, Saturday
Yom Kippur*

September 28, Friday
Last day to file Intent-to-Graduate form for December, 2007 graduation without late fee

October 5, Friday
Last day to withdraw, to drop to part-time, or to reduce part-time hours and qualify for tuition refund based on 1/2 difference in tuition
Last day to drop courses or change to Audit ($25 late fee continues to apply)
Last day to drop Honors designation
Last day to carry more than 20 credits without tuition surcharge

October 12, Friday
Fall break day, no classes
Mid-semester
Last day to withdraw from the University without grades of WP or WF

November 6, Tuesday
Election Day – no exams scheduled

November 12, Monday
Veterans Day observed, University holiday, no classes, offices closed

November 13, Tuesday
Classes follow MONDAY schedule

November 21, Wednesday
Classes follow FRIDAY schedule

November 22-23, Thursday-Friday
Thanksgiving Holidays, no classes, offices closed

November 26, Monday
Classes resume

December 7, Friday
Last day an announced oral or written exam may be given before finals

December 14, Friday
Last day of classes
Last day to file Completion of Minor form for December graduates
Last day to change college until January

December 17, Monday
Reading Day; 6:00 p.m. final exams begin

December 18-22, Tuesday-Saturday
Final exams

December 23-January 1
Holiday break, offices closed

December 31, Monday
Graduation date (no ceremony)

Semester II

January 21, Monday
Martin Luther King, Jr. Day, University holiday

January 22, Tuesday
Classes begin

February 1, Friday
Last day to withdraw, to drop to part-time, or to reduce part-time hours and qualify for tuition refund based on 3/4 difference in tuition
Last day to drop courses or change to Audit ($25 late fee continues to apply)
Last day to drop Honors designation
Last day to carry more than 20 credits without tuition surcharge

February 15, Friday
Last day to file Intent-to-Graduate for May 2008 graduation without late fee

February 22, Friday
Last day to withdraw, to drop to part-time, or to reduce part-time hours and qualify for tuition refund based on 1/2 difference in tuition
Last day to drop courses or change to Audit ($25 late fee continues to apply)
Last day to drop Honors designation
Last day to carry more than 20 credits without a surcharge

March 14, Friday
Mid-semester
Last day to withdraw from the University without grades of WP or WF

March 17-21, Monday-Friday
Spring recess

March 21, Friday
Good Friday*

March 24, Monday
Classes resume

April 20, Sunday
Passover*

April 25, Friday
Orthodox Good Friday*

May 5, Monday
Last day an announced oral or written exam may be given before finals

May 12, Monday
Last day of classes
Last day to file Completion of Minor form for May graduates

May 13-14, Tuesday-Wednesday
Reading Days

May 15, Thursday
Final exams begin

May 17, Saturday
Thompson School Commencement ceremony

May 20, Tuesday
Thompson School final exams end

May 22, Thursday
Baccalaureate/graduate final exams end

May 23, Friday
Senior Day

May 24, Saturday
Baccalaureate/graduate Commencement ceremony

Summer Session 2008

May 26-August 15

*Religious and cultural holidays, although not University holidays, are important to many members of the University community and are noted here to facilitate planning of University events. A more comprehensive list may be found at www.interfaithcalendar.org.
DIRECTIONS TO CAMPUS

By Car

FROM BOSTON, MASS.
Take I-95 North to Portsmouth, N.H., bearing left towards NH Lakes and Mountains, on Routes 4 & 16 (Spaulding Turnpike) to Exit 6W (Concord-Durham). Follow Route 4 West to Route 155A. 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 26. 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
From Logan International Airport, Boston, you may use the C & J Trailways bus service. Advance reservations are not required. For further information call (603) 742-5111 or, outside New Hampshire, (800) 258-7111.

By Bus
Depart C & J Trailways bus service across from South Station in Boston. For further information call (603) 742-5111 from New Hampshire or (800) 258-7111 outside of New Hampshire.

FREQUENTLY CALLED NUMBERS

Directory Assistance and Information .......... (603) 862-1234
(on campus) ................... Dial 0
Office of Admissions ........... 862-1360
Financial Aid Office ........... 862-3600
Department of Housing .......... 862-2120
Business Services .............. 862-2230
Registration and Records .... 862-1500
Health Services ............... 862-1530
Honors Program ................ 862-3928
Orientation Scheduling ...... 862-3488
(e-mail: first.year@unh.edu)
Memorial Union and Information Center .. 862-2600
Off-Campus Housing ....... 862-3612
Traffic Services/Parking ...... 862-1010
University Police .......... 862-1427
The Access Office .......... 862-2607
(Support Services for Students with Disabilities)
Office of Multicultural Student Affairs ...... 862-2050
The Whittemore Center .... 862-1379
Campus Recreation .......... 862-2031
Athletics .................... 862-1850

Academic Advisers
College of Liberal Arts .......... 862-2064
College of Engineering and Physical Sciences .... 862-1783
School of Health and Human Services .... 862-1177
College of Life Sciences and Agriculture .......... 862-1451
Whittemore School of Business and Economics .. 862-3885
Thompson School of Applied Science .. 862-1025

Web: www.unh.edu
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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 and Equity 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.

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All aforementioned publications are available in alternate formats upon request.