



Northeastern
UNIVERSITY

Higher Learning. Richer Experience.

Undergraduate Catalog

Full-time Day Programs

2003-2004



NORTHEASTERN UNIVERSITY

2003-2004

Undergraduate **Catalog**

Full-time Day Programs

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Message from the President

Greetings,

As a significant part of Northeastern's commitment to enhancing the quality of students' academic and co-op experiences, the University changes to a semester calendar in fall 2003. If you enrolled at Northeastern before the semester conversion, your quarter hour credits will be converted to semester hour credits at a rate of 4:3. As long as you stay on track with your classes and co-op assignments and work with your academic and co-op advisers to develop a personal transition plan, you will graduate on time and at no additional cost save annual tuition increases.

The academic year consists of a 15-week fall semester, a 15-week spring semester, and two 7 1/2 week summer sessions. If you enrolled after the semester conversion, normally you will be in class for seven semesters in the fall and spring and during two summer sessions. You will also typically complete three 6-month co-op assignments during your five years at Northeastern.

The semester conversion benefits you in two significant ways:

- 1.) It improves your academic experiences. Because semesters are substantially longer than quarters, you have more time to absorb and understand the material covered in your courses, and your professors are able to cover course material in more detail.
- 2.) It enhances your cooperative education experiences. The semester system standardizes the length of each co-op to six months, rather than dividing them into three-month segments as happened under the quarter system. The longer co-op placements are intended to provide you with higher-quality work experiences and greater opportunities for increased professional responsibilities. Employers we have surveyed are firmly in favor of six-month co-op assignments over shorter work periods.

All of us at Northeastern are strongly committed to a smooth and student-centered transition. I encourage you to talk to your advisers about your course/co-op schedule if you have any questions.

The move to a semester calendar is an exciting opportunity for us to improve the Northeastern University experience. I look forward to moving through this transition with you.

Richard M. Freeland
President

The excellence of a Northeastern education is a result of the integration of classroom learning and real-world experience. We combine course work in the liberal arts and professional studies with our signature cooperative education program (co-op for short) and other types of experiential learning to form the most complete education possible.

Higher Learning. Richer Experience

Northeastern's model of integrated learning provides you with intellectual stimulation and practical real-world experience through a program that typically takes five years, although four-year options are available in most programs. Your freshman year consists of classroom study in the liberal arts and your chosen field. You'll also take a seminar that will help you develop the skills you need to succeed in class and on co-op. During your upperclass years, you'll alternate periods of study with co-op work. You may also undertake group projects, independent research, clinical placements, service learning, and presentations to complete your academic experience.



U.S. News & World Report *ranks Northeastern #1 in the nation for co-ops and internships.*





Academic Excellence

Northeastern takes higher learning to a richer level. Our outstanding professors, an academically challenging curriculum, and high-profile research projects infuse the classroom with intellectual curiosity and the spirit of discovery. As a Northeastern student, you'll work alongside faculty who are pioneers in their fields, explore new areas of interest, and pursue independent or faculty-sponsored research. No matter which field of study you choose, the academic opportunities you encounter will challenge and reward you.

Choice and Opportunity

Northeastern offers you choice as well as challenge—seventy majors and concentrations, thirty-nine dual majors, and sixteen interdisciplinary majors and minors. Among our innovative academic programs: the Bachelor of Science in international business, which combines classes and co-op overseas; the East/West Marine Biology Program, which includes field study in Jamaica, Washington State, and Nahant, Massachusetts; and the six-year program leading to a doctoral degree in pharmacy.

Honors Program

More than 1,600 students participate in the Honors Program, which promotes an ambitious approach to academic life. As an Honors student you'll pursue advanced course work, including an interdisciplinary Honors Seminar; and special projects, such as independent research. The Honors Program also offers smaller classes and off-campus cultural activities. For more information on the Honors Program, visit www.honors.neu.edu

Study Abroad

Northeastern sponsors forty study-abroad programs in twenty-six countries. A diverse range of programs is available on six continents. You might study art and architecture in Florence, Italy; expand your knowledge of Vietnamese language and culture; or explore the ecology of Costa Rica's tropical forests. For more information on study abroad, visit www.casdn.neu.edu/sap



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The University

Admission

ADMISSION POLICY AND ENTRANCE REQUIREMENTS

Admission to Northeastern is selective and competitive. Each year, we receive more than 21,000 applications for 2,800 places in the freshman class. In building a diverse and talented incoming class, the Admissions Committee seeks to enroll students who have been successful academically and who have been involved in high school activities and their communities. Students who have earned strong grades in a rigorous college preparatory program, are innovative, and possess leadership abilities are most successful in our admission process.

The typical Northeastern applicant usually pursues a challenging high school course load that would include classes beyond the normal requirements for graduation. While considering each student's particular high school profile, the committee will consider whether the applicant's high school transcript reflects the various academic opportunities offered such as honors, advanced placement, international baccalaureate, or college-level courses.

We receive more than 3,000 transfer applications for 750 places each year. The Admissions Committee takes into consideration such factors as the candidate's academic transcript, résumé, and essay. Our most successful candidates for transfer admission typically have a minimum grade-point average of 3.000. The Admissions Committee encourages transfer applicants to submit a completed application and all supporting materials well before the priority deadline, as the number of students admitted to each program is limited.

Students may apply directly online; applying online at www.admissions.neu.edu is both preferred and a faster, more convenient method of submitting your application. Students may also apply with the Northeastern University paper application (which may be printed off our Web site) or with the Common Application. Please contact the Office of Undergraduate Admissions if you have any questions about the application process.

General information questions and all mailings should be directed to:

Office of Undergraduate Admissions
150 Richards Hall
Northeastern University
360 Huntington Avenue
Boston, MA 02115

admissions@neu.edu (e-mail)
www.Northeastern.edu (Web site)
AOL keyword: Northeastern University
617.373.2200 (voice)
617.373.8780 (fax)
617.373.3100 (TTY, for the hearing impaired)

Deadlines

Interested freshman and transfer applicants may apply for entrance to either the fall or spring semester.* Please note that there is limited space for spring entrance.

January 1	Priority consideration for admission, merit scholarships, and admission into the Honors Program
February 15	Regular decision deadline
May 1	Transfer students regular decision deadline

We strongly encourage prospective freshmen to submit their completed applications as early as possible because many of the most popular programs are competitive and fill quickly. Although February 15 is our regular decision deadline, it is in your interest to apply well before this deadline for best consideration for admission to your first- or second-choice major. Students who would like to be considered for merit scholarships and for admission to the Honors Program should submit a completed application by January 1. To meet our regular decision deadline, transfer students should submit a completed application by May 1. Due to the competitive nature of the applicant pool, it is in the transfer applicant's best interest to apply well before this deadline.

Decisions

Decisions will be released for freshman applicants between March 1 and April 1. Transfer students may expect to receive decisions on a rolling basis.

Required Materials

The committee will evaluate an applicant's candidacy for admission only when it has received a complete application package. Please ensure that your name and Social Security number are on every piece of your application package.

*Throughout this catalog, the word semester refers both to full semesters and to half semesters, except in cases where there is a cost or timeline difference. In such cases, the terms "full semester" and "half semester" are used.

Freshman Applicants

In addition to the application for admission, prospective freshmen must submit the following:

- official secondary school transcripts, including midyear senior grades. General Equivalency Diploma (GED) recipients should provide their official score reports. Students who received schooling at home should submit an academic portfolio consistent with their state guidelines and provide a list of all textbooks used. Home-schooled applicants must also provide proof that they have met all requirements to receive an official high school diploma.
- list of all current or in-progress high school classes or college courses (if applicable).
- official transcripts for any college-level course work taken while a secondary school student.
- portfolio. (The portfolio is required for music technology applicants and recommended for visual arts applicants. Please see “Admission Requirements for Art and Music Technology” on the following page for more information.)
- written recommendations from their secondary school guidance counselor and a teacher.
- results of the College Board Scholastic Assessment Test I (SAT I) or the American College Testing Program (ACT). Northeastern’s CEEB College Code is 3667.
- essays.
- activities list.

Transfer Applicants

In addition to the application for admission, prospective transfer students must submit the following:

- official transcripts for all college courses at all colleges and universities attended. There is no exception to this requirement. All academic credit with a C average or better will be evaluated.
- a list of current and anticipated courses, with their individual credit values, by term.
- two recommendations from academic advisers, professors, or employers, on official letterhead and submitted in sealed envelopes.
- SAT I or ACT results (only if the transfer applicant has completed fewer than twenty-seven semester-hours of college-level academic work).
- an official, final high school transcript or an official GED score report.

Transfer applicants who have earned credits at an international university must have a recognized agency evaluate their transcripts and translate them into English. If you are seeking to transfer into art and certain music programs, additional requirements may apply.

International Applicants

International applicants are encouraged to apply online at www.admissions.neu.edu. You also will find application procedures for international applicants and a PDF file of our application at our Web site. To request an international application package, please call the undergraduate admissions office at 617.373.2200.

In order to maintain lawful student status in the United States, international students must be very mindful of the rules and regulations that govern their nonimmigrant visa classification. Numerous U.S. federal mandates and regulations implementing the Student and Exchange Visitor Information System (SEVIS) make it especially important for students in the “F” (student) and “J” (exchange visitor) categories to consult regularly with an international student adviser at the International Student and Scholar Institute (ISSI) before taking any action that might impact their immigration status and educational endeavors in the United States.

International students must register full time, on time (within the appropriate registration period) during the regular academic year. In addition, international students must not begin or resume any type of employment without first obtaining proper employment authorization or verification from the ISSI. Any exceptions from full-time registration requirements must be preapproved by the ISSI in accordance with specified federal regulations.

Requirements for Applicants Whose Primary Language Is Not English

Freshman applicants and transfer students whose primary language is not English must take the Test of English as a Foreign Language (TOEFL), the Advanced Placement International English Language Proficiency (APIEL) Test, or the English Language Proficiency Test (ELPT). Freshman applicants whose primary language is not English must also submit test results from either the SAT I or the ACT. It is your responsibility to ensure that your test scores are either submitted directly to Northeastern by the testing service or are included on your official high school transcript.

In certain cases, students whose primary language is not English may be exempt from the above testing requirements. The following are the conditions under which such students do not need to submit English proficiency test results:

- if your primary language is not English, and you have received a score of at least 450 on the verbal section of the SAT I.
- transfer applicants who have completed English Composition I and II at a college or university in the United States or Canada, and earned a grade of B or higher in both courses.

Please contact the undergraduate admissions office at 617.373.2200 with any questions about English proficiency requirements.

College, Major, and Length of Program Selection

Applicants to Northeastern University apply to one of our six undergraduate colleges or the School of Engineering Technology. Because admission to some programs is more selective than others, you are asked to identify both a first and second-choice major or concentration. For best consideration, you are strongly encouraged to select a second-choice major.

Although an “undecided” or “open option” category has been made available in most colleges, we encourage you to select a major that reflects your current academic interests and aspirations.

Please note that freshmen may not apply directly to the School of General Studies program. The Admissions Committee refers appropriate applicants to this program.

While you are attending Northeastern University, we expect that most students will follow the five-year model to maximize Northeastern's co-op opportunities. However, four-year options are available in most of our programs. The four-year program with co-op may require you to enter Northeastern with advanced placement or college credit and/or take a more demanding course load. You are not required to make a decision on the four-year option upon entry, but are requested to indicate your preference on your application for admission.

Early Admission

In certain cases, students may enroll at Northeastern before the expected year of their high school graduation. Before enrolling at the University, all applicants for early admission must have completed all units required for high school graduation (including senior English), or must have earned the General Equivalency Diploma (GED). Endorsements by the student's school principal, guidance counselor, and parents are required for early admission. The applicant must also provide a 200-word personal statement outlining his or her educational and/or career aspirations.

Advanced Credit

You may enter the University with advanced credit on the basis of your test scores on advanced placement (AP) examinations, the international baccalaureate (IB), or on successful completion of accredited college-level courses that you took before you enrolled at Northeastern. Students must submit official score reports for credit evaluation.

International Baccalaureate

Only higher-level final examinations with grades of 5, 6, or 7 will be considered for college credit. Standard-level examinations are not considered for college credit. For information about other international examinations, contact the Office of Undergraduate Admissions.

Advanced Placement

An applicant may receive college credits if he or she has received a 3, 4, or 5 in the following subject exams: art history, biology, chemistry, English "A," geography, history (contemporary, European, or modern), language (French, German, Italian, Russian, or Spanish), mathematics, philosophy, physics, social anthropology, art-design, classical languages, music, Islam (humanities elective), history of the Americas, and other languages (elective credit).

Admission Requirements for Art and Music Technology

For candidates applying for admission into the music technology program, a portfolio is required and will be reviewed by a committee of faculty. For candidates applying for admission into the visual arts programs (including art, animation, photography, and graphic design), it is strongly recommended that

a portfolio be submitted. The portfolio may include work in a variety of media; no particular subject matter or style is required. Rather, you should select work that best shows your personal style, skills, creativity, and commitment to innovation.

Music Technology and Portfolio Requirements

Portfolio for music technology must include:

- three representative examples of your creative work in a form that best represents the project, including lead sheets of original songs or printed scores of original compositions or arrangements; digital format, which might include MIDI or digital audio files on floppy disk, data CD, or Zip disks (PC and Mac formats are acceptable); or URLs for Web sites that include original music or sounds. Audio recordings of compositions are highly recommended (audio CD or cassette preferred). Videotape recordings of live performances of your music are also acceptable. (Supply a self-addressed, stamped envelope if you wish to have your materials returned.)
- a short statement explaining your involvement in the creation of the work. The statement should note whether you are the sole creator or a collaborator; the composer, arranger, or remixer; and whether you are performing the work on the recording(s).
- a separate, typed one-page statement of your musical background, influences, and goals.

Music technology applicants are strongly encouraged to arrange an in-person or telephone interview with a music technology faculty member by calling 617.373.2440. Once enrolled, students seeking to pursue a concentration in music literature and performance must audition as part of the evaluation process.

Visual Arts and Portfolio Requirements

Portfolio requirements for visual arts include:

- fifteen slides of original artwork presented in an 8" x 11" slide sheet. (Supply a self-addressed, stamped envelope if you wish to have your materials returned.)
- all slides should be numbered and clearly labeled on the front with your name, title of work, date completed, dimensions, and media used. An arrow should indicate the top of the slide. Include a separate, typed slide list with your name, address, telephone number, and Social Security number.
- a separate, typed one-page artist's statement that describes your artwork, background, interests, goals, artistic influences, and other pertinent information.

Applicants without portfolios may be accepted into the department as probationary art majors. Final acceptance into the art major, graphic design major, photography concentration, or animation concentration is dependent upon a review of the applicants' grades and a portfolio created during their freshman year. Students will be aided in the development of this portfolio through first-year course work. For further information about portfolio development, please refer to the Department of Visual Arts in the College of Arts and Sciences on page 111.

MERIT SCHOLARSHIPS

Scholarships reward academic excellence. Northeastern has established several competitive scholarship programs to reward and recognize outstanding academic achievement. To be considered for one or more of these prestigious awards, you must apply for undergraduate admission to Northeastern by January 1. Only U.S. citizen (or permanent resident) fall freshman applicants are eligible for these scholarships.

Boston Achievement Awards

Award: Full tuition. Recipients who maintain normal progress toward a degree, with a minimum GPA of 3.000, may renew the award for the full four- or five-year program. Applicants must submit their complete application by February 15 to be considered for this award.

Eligibility: Applicants for fall freshman admission who are residents of Boston and who graduated from high school in the top 25 percent of their class.

Carl S. Ell Scholarships

Award: Full tuition, campus room and board (double occupancy). Recipients who maintain normal progress toward a degree, with a minimum GPA of 3.000, may renew the award for the full four- or five-year program.

Eligibility: The top 1 percent of freshman applicants may be considered for this award. Each year, we enroll twenty-five Ell scholars.

Deans', Excellence, and Achievement Awards

Awards: Partial tuition scholarships ranging from \$2,500 to \$16,000. Recipients who maintain normal progress toward a degree, with a minimum GPA of 3.000, may renew these awards.

Eligibility: The top 25 percent of freshman applicants may be considered for these awards.

Phi Theta Kappa Scholarships (Transfer Students Only)

Award: \$5,000 grant. Recipients who maintain normal progress toward a degree, with a minimum GPA of 3.000, may renew the award.

Eligibility: Applicants for fall transfer admission who have earned a 3.500 grade-point average in 27 semester-hours or 36 quarter hours, or who have earned an AA, AS, or AAS degree. A letter of recommendation from a Phi Theta Kappa adviser is required. The application deadline for this award is April 1.

Ralph J. Bunche Scholarships

Award: Full tuition, campus room and board (double occupancy). Recipients who maintain normal progress toward a degree, with a minimum GPA of 3.000, may renew the award for the full four- or five-year program.

Eligibility: The top 2 percent of freshman applicants may be considered for this award. In awarding this scholarship, the University will consider the extent to which the applicant furthers the University's commitment to a diverse student body.

Reggie Lewis Memorial Scholarships

Award: Full tuition. Recipients who maintain normal progress toward a degree, with a minimum GPA of 3.000, may renew the award for the full four- or five-year program.

Eligibility: The top 2 percent of freshman applicants may be considered for this award. In awarding this scholarship, the University will consider the extent to which the applicant furthers the University's commitment to a diverse student body. Factors such as family income, family history of higher education, race, ethnicity, and geographic location will be incorporated into the selection process.

Information for Entering Students

NEW STUDENT ORIENTATION

Undergraduate students entering the University are required to participate in an orientation program prior to their arrival. This required program is a valuable opportunity to prepare for a successful academic career at Northeastern University. During the months of June, July, and August for fall start and November and January for spring start, freshmen and transfer students will attend a selected orientation session designed to meet their particular needs. Several of the sessions are designated for freshmen; others are designated for transfer students. Each of Northeastern's schools and colleges is assigned to specific sessions. Participants will attend a session hosted by the school or college to which they have been admitted.

The new student orientation staff includes orientation leaders, students who will serve as valuable resources for information and assistance throughout the program. In addition to the orientation leaders, staff and faculty from various campus offices and the school or college will be available to answer questions and to provide assistance in making arrangements for the fall or spring. During new student orientation, participants will complete placement exams, meet with representatives from their school or college to develop a fall class schedule, register for classes, and obtain a student identification card. Participants will also learn about life at Northeastern, including services and opportunities that will assist with their transition to the University. Students will be able to finalize details related to dining services, housing, and financial aid. In addition, participants will be able to meet other students from their respective college or school, discover the myriad of student involvement opportunities, and explore how cooperative education will enhance their experience at Northeastern. Student participants will stay in a campus residence hall during June, July, and August orientation; housing is not provided for the November or January orientation programs. Parents/family will participate in a separate but parallel program and will also be invited to stay in a campus residence hall during the summer program. Registration information will be mailed to incoming students who have paid their tuition deposit.

PARENT AND FAMILY SERVICES

The Office of Parent Programs and Services serves as a resource to parents and families of Northeastern University students. Through active participation in internal and external University events and programs, this office outlines its services and programs and begins to develop a relationship with the NU parent and family population. Ongoing newsletters and

programs will keep parents and family members connected to the University and informed of deadlines, events, and services, which will assist them as they support their student's educational pursuits. During the academic year, parents and family members are invited to contact the office as they seek information or assistance in addressing concerns related to their student's enrollment.

The Office of Parent Programs and Services will be expanding its active Parent Advisory Board to a larger, more comprehensive Parents Association. The association, NU PA, will be geared toward involving all NU families in the campus community and providing a greater scope of information and networks while your student is enrolled at Northeastern University.

NU parents and family members are encouraged to become members of the Parents Association as a means of participating in the student's academic and cocurricular life.

ORIENTATION ASSISTANCE FOR INTERNATIONAL STUDENTS

The International Student and Scholar Institute (ISSI) organizes Orientation Assistance for International Students (OASIS) to facilitate the acculturation process for newly arrived international students while also providing a forum for intercultural interaction and learning. OASIS activities include an "airport welcome," cultural enrichment programming, information sessions, immigration advising, regional excursions, intercultural/diversity education seminars, and workshops on topics ranging from academic success to student life. The OASIS program, beginning prior to the start of the fall and spring semesters, comprises several weeks of programming that provides the international student an opportunity to gain familiarity with Northeastern in a cross-cultural context while forming friendships across cultures.

RESIDENTIAL LIFE

Northeastern University is pleased to offer all freshman students a housing guarantee through the sophomore year. More than 90 percent of the incoming class resides in one of our ten coed residence halls.

The University offers a variety of housing options tied to specific programs of study. These halls offer students a supportive, achievement-oriented environment with opportunities for continued learning and sharing outside the classroom. Academic floors commonly feature tutoring, advising, and

study groups, as well as unique programs designed to promote student growth and advancement. The University also recognizes that some students prefer to live in an environment of shared values and choices. Lifestyle/cultural housing options are also available.

The Department of Residential Life strives to create a community for students by providing programs, services, and facilities that promote all residents' educational, social, and cultural development. Resident assistants and professional staff are skilled in counseling, crisis intervention, and conflict resolution. Each floor and building is a unique community, and anything that affects the welfare of that community is of concern to staff. Each residence hall is staffed by a complex coordinator, resident director, assistant resident director, and/or graduate assistant who maintain close contact with students and serve as administrators for the building.

HEALTH REQUIREMENTS—LANE HEALTH CENTER

The Lane Health Center's Health Report is included with confirmation of the new student orientation session date. It must be completed and returned when students register at their orientation session. The health statement section (to be signed by a health-care provider) provides an assessment of the entering student's health status. The completed required record of immunity section is necessary for compliance with the Massachusetts College Immunization Law. Failure to meet the requirement will prevent future course registration. Additionally, further documentation of immunity is mandatory for students in Bouvé College of Health Sciences.

Visit www.lanehealthcenter.neu.edu to access the Health Report online.

ENGLISH LANGUAGE CENTER

The English Language Center (ELC) conducts English language testing for incoming international students. This testing is mandatory for undergraduate conditionally admitted students.

The testing consists of five tests: grammar, writing, reading, listening, and speaking. Most departments on campus require that students achieve a score of at least seventy on all five tests in order to be admitted into full-time academic studies. The School of Nursing and the College of Computer and Information Science require scores of eighty.

Any department may refer students for testing. Students must come on time on designated test days with a referral form in hand. Students without referral forms will not be tested. Referral forms and a schedule of test dates are available by request through the ELC.

The ELC also offers a variety of language support courses for students who need assistance.

Advisers and departments are encouraged to contact the associate director of the ELC with any questions regarding testing or language support for international students.

For further information about English language testing, visit the ELC Web site, www.ace.neu.edu/elc or contact the ELC office, 406 Ell Hall, 617.373.2455.

College Expenses

Northeastern University is eager to assist you in developing a plan for financing a Northeastern education. Through a variety of options—financial aid, Northeastern's Monthly Payment Plan, supplemental loans, and your own resources—a plan can be designed that will make your education costs affordable. Visit us on the Web at www.customerservice.neu.edu or call 617.373.2270.

FINANCIAL AID

For many families, financial aid is a major element in making Northeastern University affordable. The Office of Student Financial Services provides a full range of options that help undergraduate and graduate students establish a comprehensive plan to finance their educations. To take advantage of Northeastern's financial aid programs, freshmen must submit the FAFSA and CSS PROFILE forms and returning students must submit the FAFSA. For more information, please visit www.customerservice.neu.edu or contact the Office of Student Financial Services at 617.373.3190.

STUDENT/PARENT LOANS

In addition to the federal loans that may be on your Offer of Financial Assistance, there are additional loans that can assist you in financing your Northeastern education. Federal PLUS loans for parents/guardians are available at competitive interest rates; you may borrow up to the cost of your education less any financial aid or loans you are receiving. The MEFA loan, a family loan program, is available to all Northeastern families (regardless of state of residence), subject to credit requirements. For information about these and additional borrowing options, please contact the Office of Student Financial Services at 617.373.3190.

Northeastern's Monthly Payment Plan

All full-time students have the option to enroll in Northeastern's Monthly Payment Plan. This plan allows students and families to spread their annual tuition costs (less the financial aid) over eleven months. (See enrollment dates below.) The plan is administered by Academic Management Services (AMS). For additional information, contact the Customer Service Center at 617.373.2270 or AMS at 800.635.0120, or visit their Web sites at www.customerservice.neu.edu or www.tuitionpay.com, respectively.

Enroll by Monthly payments

June 15	Budget amount/11 payments
July 15	Budget amount/10 payments
August 15	Budget amount/9 payments

Three- and four-month payment plans for individual semesters are also available.

PAYMENT METHODS AND DUE DATES

The following are accepted methods of payment:

- Check or money order made payable to Northeastern University.
- MasterCard, VISA, American Express, or Discover. Payments may be made by calling our 24-hour automated charge line, 617.373.2319 or, outside Massachusetts, 800.937.4067.
- Enrollment in Northeastern's Monthly Payment Plan.

Full payment of tuition, residence hall fees, and other related charges are due two weeks prior to the start of each semester.

Students are responsible for the prompt payment of all bills. If you have not received a bill by the first week of the semester, please contact the Customer Service Center and a bill will be generated for you.

Discrepancies in your bill should be addressed in writing to the Customer Service Center. Include your name, account number, dollar amount in question, date of invoice, and any other information you believe is relevant. Address the correspondence to: Customer Service Center, 254 Richards Hall, Northeastern University, 360 Huntington Avenue, Boston, MA 02115 or e-mail customerservice@neu.edu. If there is a billing problem, pay the undisputed portion of the bill to avoid responsibility for any late fees.

Overloads/Reduced Loads

Undergraduate day tuition is charged on a flat per-semester basis that includes the cost of each student's normal academic curriculum requirements for that semester. An overload occurs when a student is enrolled in more courses than prescribed by the program's curriculum. Undergraduate full-time day students may register for an additional 1 semester-hour course from a selected list, without added charge, as long as they are registered for a full course load. Adjustments are made for undergraduate full-time students with reduced loads only when the course load falls below twelve credits. Students taking a course when on a co-op placement are charged at the overload rate.

Delinquent Balances

In cases of student default on tuition payments, the student is liable for the outstanding tuition as well as for all reasonable collection costs and any legal fees incurred by the University during the collection process. Accounts may be subject to monthly interest charges. *Transcripts and other academic records will not be released until all financial obligations to the University have been met.*

Refunds and Complete Withdrawal

Students who officially withdraw during a semester will receive a tuition refund based on the refund policy stated below. Institutional funds awarded by Northeastern University will be adjusted based on the actual charges incurred during the semester. Funds from Title IV programs will be returned to the government according to federal regulations. The federal government "return of funds" policy dictates that a student's eligibility for federal financial aid is determined by the number of days enrolled in the semester. The refund will be calculated from the date the student submits a notification of withdrawal to the Office of the Registrar.

Official Withdrawal Adjustment

Tuition credits are based on the date of the official withdrawal processed by the registrar's office. *Nonattendance does not constitute official withdrawal.* Credit policies vary according to the duration of the course. Tuition adjustments are made according to the following schedule. Note that the first week ends on the Friday following the first day of classes.

Full semesters

During the first week	100% refund
During the second week	90% refund
During the third week	80% refund
During the fourth week	60% refund
During the fifth week	40% refund
After the fifth week	no refund

Half semesters

During the first week	100% refund
During the second week	75% refund
During the third week	50% refund
During the fourth week	25% refund
After the fourth week	no refund

Medical and Nonmedical Leave

Medical and nonmedical leaves are granted when a student cannot complete the current academic period for health or personal reasons but is confident that he or she will *reenroll within six months*. Northeastern's medical and nonmedical leave policy states that all tuition paid for such periods of leave will be held by the University and applied to future charges. Outstanding balances (including unpaid balances) for the semester in which leave is taken are still due the University during that semester. Financial aid recipients should contact their financial aid counselor to understand the effects on aid

received. Note: Leave petitions are available in college deans' offices and specify the conditions and procedures under which leaves may be granted. Leaves are described more fully on pages 19 and 20.

Disability Resource Center Adjustments

Students who are registered with Northeastern's Disability Resource Center are eligible to petition the center for tuition adjustments directly related to their documented disability. Further information is available from the Disability Resource Center.

TUITION, ROOM, BOARD, AND FEES PER SEMESTER 2003–2004 ACADEMIC YEAR

Full-time freshmen spend two semesters in classes and summer on vacation. Full-time upperclass students participating in the co-op program typically spend a full semester and a half semester in classes and six months on co-op. The number of semesters a transfer student spends in school depends on the curriculum of the student's college. You are advised to verify your curriculum with your dean's office so that you may plan accordingly.

The total costs for students living in our residence halls and enrolled in the nineteen-meal plan are as follows:

Tuition and fees	Per full semester	Per summer half semester
Tuition	\$12,800	\$6,400
Student center fee	70	35
Student activities fee	100*	
<i>Room, board, and fees per semester</i>		
Residence activity fee	28	14
Housing	range from 1,750–4,550**	1/2 of semester rate**
Fifteen-meal plan***	2,100	1,050

*Annual fee

**Rates vary depending on occupancy and assignment. Visit www.housing.neu.edu for a detailed list of housing rates.

***See Meal Plan section for additional meal plan options.

To plan for tuition and fees better, please refer to the following tables showing the most commonly used class/cooperative education patterns of attendance.

Cooperative education in second half of summer and in fall:

Year	Fall	Spring	Summer 1	Summer 2
1	Class	Class	Vacation	Vacation
2	Class	Class	Vacation	Co-op
3	Co-op	Class	Class	Co-op
4	Co-op	Class	Class	Co-op
5	Co-op	Class		

Cooperative education in spring and in first half of summer:

Year	Fall	Spring	Summer 1	Summer 2
1	Class	Class	Vacation	Vacation
2	Class	Co-op	Co-op	Class
3	Class	Co-op	Co-op	Class
4	Class	Co-op	Co-op	Vacation
5	Class	Class		

No cooperative education:

Year	Fall	Spring	Summer 1	Summer 2
1	Class	Class	Vacation	Vacation
2	Class	Class	Vacation	Vacation
3	Class	Class	Vacation	Vacation
4	Class	Class		

Please note that not all of the above patterns are available in all academic programs and that some programs follow patterns different from those shown above.

In addition to the expenses itemized above, families should plan on the normal costs of living that students incur for transportation, books, and personal expenses. These vary depending upon such things as lifestyle and distance from home, but for the purpose of approximating a student budget, the University estimates these items at \$2,900/year for residents and \$5,100/year for commuting students.

Tuition rates, room and board charges, and fees are subject to revision by the Board of Trustees at any time.

The following fees are required of all students:

Application Fee

This nonrefundable \$50 fee must accompany an application for admission.

Tuition Deposit

A nonrefundable tuition deposit of \$200, which is applicable toward the first semester's tuition, is due by May 1 from all students entering in September. Students entering at other times of the year should note the required deposit date on their letter of acceptance.

Summer Orientation Fees

A nonrefundable fee will be charged to the student's account upon registration for the orientation session. This fee covers all program materials, meals, staffing, and housing. The fee is \$125 for the two-day program for new students and \$80 for the one-day program for transfer students. Any parent or family member wishing to participate in the concurrent parent and family orientation session may register and must also include a nonrefundable fee of \$125 with his or her registration. There are separate fees for housing for the parent and family orientation programs.

Student Services Fee

Students pay a \$70 per full semester or \$35 per half semester student center fee to support the Curry Student Center and a \$100 annual student activities fee to support student clubs.

Husky Card (Photo-Identification Card)

This card is issued to new full-time students at orientation and registration. Students must have a properly validated card to use most University facilities. A replacement card costs \$10.

University Health Insurance

Massachusetts state law requires that all full-time and three-quarter-time matriculated college students be enrolled in a health insurance plan that meets the state requirements. Northeastern University Student Health Insurance Plan (NUSHIP) meets and exceeds state requirements and is required for those students who do not have comparable coverage with another health insurance plan. If you have comparable health insurance coverage, you may waive NUSHIP by completing a waiver form by the designated deadline date. For more information on the state regulation, please visit www.state.ma.us/dhcfp/ or visit www.chickering.com for more information regarding NUSHIP.

Sports Pass Fee (Not Required)

This \$70 annual fee allows students to attend all regular home games without additional charges. This fee can be waived via myNEU Web Portal (myNEU.neu.edu) or through the telephone voice response system (617.373.8000).

Other fees may include the following:

Housing Prepayment

New students seeking on-campus housing must submit a non-refundable \$400 prepayment along with a completed housing application form to complete the housing application process. The upperclass housing prepayment is \$200 for one semester or \$150 per semester for two or more semesters.

Residence Hall Activities Fee

All students living in the residence hall system pay a full-semester \$28 fee or half-semester \$14 fee for activities sponsored by the Residence Student Association.

Late Fees

All accounts not paid in full by the indicated due dates will be subject to a late fee.

International Student Fee

A one-time fee of \$200 is charged to new undergraduate international students, payable after their acceptance at Northeastern University. The fee supports services available at the International Student and Scholar Institute (ISSI).

Room and Board

Room Rates per Semester, 2003–2004

Please visit the Department of Residential Life Web site, www.housing.neu.edu, for a complete display of room rates and residence halls.

Termination Fee and Room Rate Adjustment Policy

The University provides on-campus and leased accommodations that are assigned each semester. Students are billed at the beginning of each semester and are obligated to pay the full charge for the semester. The high demand for on-campus housing makes it necessary for Residential Life to strictly enforce its cancellation policy.

It is imperative to note that a student whose Residence Hall and Dining License Agreement is revoked for disciplinary reasons is subject to the same financial assessments as outlined below.

Termination Fee Policy for Withdrawal from the University Full Semester:

Official withdrawal from University	Percentage of full semester room charge
During the first week	0%
During the second week	10%
During the third week	20%
During the fourth week	40%
During the fifth week	60%
After the fifth week*	100%

*Students withdrawing after the fifth week incur a 100% room charge for the full semester.

Half Semester:

Official withdrawal from University	Percentage of half semester room charge
During the first week	0%
During the second week	25%
During the third week	50%
During the fourth week	75%
After the fourth week**	100%

**Students withdrawing after the fourth week incur a 100% room charge for the half semester.

Termination Fee Policy for Withdrawal from the Residence Halls

Failure to provide timely written notification of cancellation of housing will result in a charge to students for their assigned space. If the cancellation deadline has passed, students who can demonstrate a significant change in academic, co-op, financial, or personal circumstances may petition for a waiver of this fee. See cancellation fee schedule that follows:

Amount Charged	Fall Notification	Spring Received	Summer 1 and 2
Deposit refunded; no charge	Before 6/16/03	Before 11/1/03	Before 3/1/04
25% of semester room charge***	After 6/16/03	After 11/1/03	After 3/1/04
50% of semester room charge***	After 7/15/03	After 11/15/03	After 3/15/04
75% of semester room charge***	After 8/1/03	After 12/1/03	After 4/1/04
100% of semester room charge***	After 8/15/03	After 12/15/03	After 4/15/04

***The student's deposit for the semester is applied to the cancellation charge assessed.

University Dining Service

All students who live in traditional University residence halls and suites are required to participate in the food plan run by University Dining Service.

Meals per week	Full semester	Summer half semester
19	\$2,275	\$1,150
15	2,100	1,050
10	1,825	925
5 (upperclass only)	925	475

Husky Account

Students deposit funds into a Husky Account and, using their Husky Cards, may purchase books, groceries, tickets, and snacks at convenient locations on and off campus.

The account accrues no interest. Contact the Customer Service Center at 617.373.2270 or visit www.customerservice.neu.edu/huskycard.html for additional information. To add funds to your Husky Account using your credit card, call 617.373.2319 or, outside Massachusetts, 800.937.4067, or to bill it to your tuition account, call 617.373.8000, choose option 4.

Academic Policies and Procedures

This section presents general information about what is expected of students and how progress toward matriculation is measured. For specific details on individual degree programs, students should consult their academic advisers. The University assumes no liability for any delay in providing or failing to provide educational or related services or facilities due to causes beyond the reasonable control of the University. Causes include, but are not limited to, power failure, fire, strikes by University employees or others, weather damage, and acts of public authorities. However, when in its judgment it is appropriate to do so, the University will exert reasonable efforts to provide comparable or substantially equivalent services, facilities, or performance; but its inability or failure to do so shall not subject it to liability. No faculty member, administrator, or other representative of the University shall make any representations to, or enter into any agreements with, or act toward any student or other person in any manner that is not in conformity with established University policies, practices, and procedures as expressed in this or any other official University document.

ACADEMIC HONESTY AND INTEGRITY POLICY

Essential to the mission of Northeastern University is the commitment to the principles of intellectual honesty and integrity.

Academic integrity is important for two reasons. First, independent and original scholarship ensures that students derive the most from the educational experience and the pursuit of knowledge. Second, academic dishonesty violates the most fundamental values of an intellectual community and depreciates the achievements of the entire University.

Accordingly, Northeastern University views academic dishonesty as one of the most serious offenses that a student can commit while in college. Academic dishonesty includes cheating, fabrication, plagiarism, unauthorized collaboration, participation in academically dishonest activities, and facilitating academic dishonesty.

All members of the Northeastern University community—students, faculty, and staff—share the responsibility to bring forward known acts of apparent academic dishonesty. Any member of the academic community who witnesses an act of academic dishonesty should report it to the appropriate faculty member or to the Director of Judicial Affairs.

The charge will be investigated and if sufficient evidence is presented, the case will be referred to the Northeastern University Student Judicial Hearing Board.

Visit www.atsweb.neu.edu/judicialaffairs/academicintegrity.html for a full description of these policies and procedures.

ATTENDANCE REQUIREMENTS

The University expects students to meet attendance requirements in all courses to qualify for credit. Attendance requirements vary; it is the student's responsibility to ascertain what each instructor requires. Failure to meet attendance requirements may force a student to drop the course, as recommended by the instructor and with the approval of the Academic Standing Committee of the college. Classes for day students are normally scheduled from 8:00 AM to 5:40 PM, Monday through Friday. Students should not make conflicting commitments until the class schedules for each semester are final. Schedule changes to accommodate part-time work are difficult and rarely made. Permission to make up work may be granted by instructors for reasonable cause. Requests must be made immediately upon a student's return to class. Laboratory work can be made up only during the hours of regularly scheduled instruction.

Excused Absences

Absence Because of Student Activities

If students must miss classes to participate in athletic contests or other forms of scheduled intercollegiate activity, they are entitled to makeup privileges. Faculty members may require a written statement from the administrator in charge of the activity.

Absence Because of Illness

A student who is absent from school for an extended period of time must inform his or her college by letter, e-mail, or telephone. The expected length of the absence will determine whether the student should apply for a medical leave of absence; see "Medical Leave of Absence" on page 19.

Absence Because of Religious Beliefs

Any student who is unable, because of his/her religious beliefs, to attend classes or to participate in any examination, study, or work requirement shall be provided with an opportunity to make up such examination, study, or work requirement that he/she may have missed because of such absence on any particular day; provided, however, that such makeup examination or work shall not create an unreasonable burden upon such school. No fees of any kind shall be charged by the institution for making available to the said student such opportunity. No adverse or prejudicial effects shall result to any student because of availing himself/herself of the provisions of this section (Massachusetts General Laws, Chapter 151C, Section 2B, 1985).

Absence Because of Jury Duty

Members of the University community are expected to fulfill their obligations to serve on a jury if called upon. A student selected for jury duty should inform his or her instructors. They will provide a reasonable substitute or compensatory opportunities for any required work missed. Such an absence will not be penalized in any way.

Absence Because of Military Deployment

The policy for military leave of absence is set forth on page 20.

CLASS SCHEDULES

All classes start promptly according to the class schedule shown. Most classes at Northeastern are scheduled in the time periods listed.

Students are expected to be punctual. Students who are late for classes should attend for the balance of the period. Instructors will not tolerate habitual tardiness.

Students may leave fifteen minutes past the scheduled opening of class if the instructor is not present. In such cases, students should notify the department giving the course that the instructor was not present.

Fall and Spring Schedule

Sequence 1	MWTh	8:00–9:05
Sequence 2	MWTh	9:15–10:20
Sequence 3	MWTh	10:30–11:35
Sequence 4	MWTh	1:35–2:40
Sequence 5	MWTh	4:35–5:40
Sequence 6	TuThF	11:45–12:50
Sequence 7	TuWF	3:25–4:30
Sequence A	MTh	11:45–1:25
Sequence B	MW	2:50–4:30
Sequence C	TuF	8:00–9:40
Sequence D	TuF	9:50–11:30
Sequence E	TuF	11:45–1:25
Sequence F	TuF	1:35–3:15
Sequence G	TuF	3:25–5:05
Sequence L	MWTh	8:00–11:35
Sequence M	MTh	11:45–2:40
Sequence N	MW	2:50–5:40
Sequence P	MWTh	8:00–10:20
Sequence Q	MTh	10:30–1:25
Sequence R	MW	1:35–5:40
Sequence S	MW	1:35–4:30
Sequence T	TuF	8:00–11:30
Sequence U	TuF	11:45–3:15
Sequence V	TuF	3:25–5:25
Sequence W	TuF	1:35–5:05

Summer Schedule

Sequence 1	MTuWTh	8:00–9:40
Sequence 2	MTuWTh	9:50–11:30
Sequence 3	MTuWTh	1:30–3:10
Sequence 4	MTuWTh	3:20–5:00
Sequence 5	TuWTh	11:40–1:20
Sequence A	MW	8:00–11:30
Sequence B	MW	1:30–5:00
Sequence C	TuTh	8:00–11:30
Sequence D	TuTh	1:30–5:00

Activities Periods

Undergraduate activities hours are Wednesday, 11:45 AM–1:25 PM, and Thursday, 2:50 PM–4:30 PM, during fall and spring semesters. Summer activities hours are Monday, 11:40 AM–1:20 PM. No classes or other academic functions are held during these hours. Violations of this regulation should be reported to the Office of Student Affairs or to the Student Government Association.

GRADING SYSTEM

Grades are officially recorded by letters, evaluated as follows.

Grades	Numerical equivalent	Status
A	4.000	Outstanding achievement
A–	3.667	
B+	3.333	
B	3.000	Good achievement
B–	2.667	
C+	2.333	
C	2.000	Satisfactory achievement
C–	1.667	
D+	1.333	
D	1.000	Poor achievement
D–	0.667	
F	0.000	
I		Incomplete in a letter-graded course.
S		Satisfactory achievement in pass/fail course; counts toward degree requirements.
U		Unsatisfactory achievement in pass/fail course.
X		Incomplete in a pass/fail course.
NE		Not enrolled. Did not attend after the date of record, the start of the second full week.
IP		Course in progress. Intended for courses such as senior thesis or a project that extends over several semesters. An IP can be replaced by a regular grade with a standard change-of-grade card. The time restrictions on the I grade do not apply to the IP grade. While unchanged, it is not included in computing the GPA. If never changed, the course does not count toward graduation requirements.

An I, IP, or X grade shows that the student has not completed the course requirements.

Individual faculty may choose not to use plus or minus designations. If faculty elect to use only whole letters, they must announce this to the class at the beginning of the semester.

Pass/Fail System

The individual schools and colleges state how and when the pass/fail system may be used. An outline of the general system follows.

- Any student not on academic probation may register for one pass/fail course per semester if permission is granted by the college in which the student is enrolled and if the course is offered on a pass/fail basis. Students may take 1 semester-hour courses in physical education and dance on a pass/fail basis in any semester. Enrollment in these courses does not prevent students from electing an additional 4-semester-hour course on a pass/fail basis.
- Pass/fail courses are normally restricted to electives outside the major field. The college faculty, however, may choose to adopt the pass/fail system of grading when it appears pedagogically sound for required courses within a program.
- Before requesting a pass/fail grade from an instructor, students should meet with their academic adviser to determine whether doing so will disqualify the course from satisfying a program requirement or elective. In general, courses taken on a pass/fail basis cannot be used to meet program requirements or to satisfy required-elective options.
- Individual faculty members may decide whether any of their courses may be taken on the pass/fail system of grading, except when uniformity is necessary. In such cases, the department and/or college faculty offering the course determine whether the pass/fail system is used.
- Grades recorded on the basis of the pass/fail system do not figure in the computation of the grade-point average. Satisfactory completion of all courses taken on the pass/fail system is designated on the student's permanent record by the letter S. Unsatisfactory work is designated by the letter U. Any unsatisfactory grade must be handled according to the existing policy of the college but must never be cleared through the election of the same course pass/fail, except when this system is the only one used by the college for grading the course.
- An incomplete in a course taken on a pass/fail basis is designated by the letter X on the permanent record and treated according to the normal procedure for incomplete grades.
- To use the pass/fail system, students must meet all prerequisites for the course. They have until the end of the second week of the semester to declare their intention to receive a pass/fail grade. This deadline may be extended to the end of the eighth week at the option of the instructor.

Clearing an Incomplete (I) or Changing Other Grades

An I grade may be reported by the instructor when a student has failed to complete a major component of a required course, such as homework, a quiz or final examination, a term paper, or a laboratory project. Students can make up an I grade by satisfying the requirements of the instructor or, if the instructor is absent, the chair of the department. Be aware that instructors' policies on the granting of incomplete grades may vary, and that the final decision on an incomplete grade is up to the instructor. The period for clearing an I grade and for changing a grade other than an I or failure (F or U) is restricted to one calendar year from the date it is first recorded on the student's permanent record.

Freshmen with multiple course deficiencies, including I grades, may be required by their dean's office adviser to rectify the deficiencies within a period of time less than the normal year.

Students wishing to make up an I grade should not do so by registering for the course again in a future semester when they are completing missing course work. Doing so will keep the original I on the student's record with a "repeat" notation, as well as the new course and grade; the new course is also subject to tuition billing. After the student has fulfilled the terms of the incomplete agreement (described below), the instructor will use standard University grade-change procedures to replace the I with a course grade without billing implications.

To clear an I grade, a student must obtain a triplicate form on which the precise agreement for clearing an incomplete (I or X) grade is specified and which is signed by the student and the instructor. Forms are available in the college or departmental office. The student must make an appointment with the instructor to arrange for clearing the I grade. He or she must then complete the form, sign the agreement, and obtain the instructor's signature; leave a copy with the instructor, take one copy to the dean's office, and retain a copy as a personal receipt. Any exception to this policy on change of grades must be recommended by the Academic Standing Committee of the college in which the course was offered and must be forwarded in writing by the dean to the registrar for implementation. (This process must be completed within one calendar year from the end of the semester in which the course was offered.)

Commencing with grades given in the fall quarter of 1986, the University policy is that any grade outstanding for twelve or more months cannot be changed.

Credit Hours

Course credit hours are assigned to a course based on the established educational standard that one credit hour is equal to approximately three hours of student learning time per week over a period of a semester (usually one hour of lecture or discussion, plus two hours of individual study outside class). When much individual study is involved, as in directed study or certain graduate courses, each additional hour of credit should represent at least three hours of student work.

Repeating Courses

Courses may be repeated in order to earn a better grade. In all cases the most recent grade earned in a course is the one used in calculating the overall grade-point average; however, previous grades remain on the transcript followed by the word "Repeat." Consult your academic adviser before repeating a course. Students are required to pay normal tuition charges for all repeated course work.

Clearing an Academic Deficiency

An academic deficiency occurs when a student fails to complete a course with a satisfactory grade. The deficiency may occur because the student has failed the course or because the student has passed the course but with a grade that does not meet the minimum required by the student's program.

Students who have academic deficiencies may be required to clear them before progressing within the curriculum, especially if the course work is a prerequisite for future course work. Deficiencies can affect the student's expected year of graduation.

With the approval of the appropriate program faculty and/or academic adviser, students can clear deficiencies in the following ways:

1. Repeat the same course at one of Northeastern's colleges.
2. Substitute a comparable course.
3. Take a comparable course at Northeastern's University College.
4. Take a comparable course outside of Northeastern University.

Dean's List

A dean's list, or honors list, is issued at the end of each fall and spring semester containing the names of students who have a 3.250 grade-point average or higher with no I grade or grade below C-. Students who are on any form of probation, who are enrolled in a course on a pass/fail basis (except where there is no alternative or where required by the program), or who are not carrying a full load as determined by their undergraduate college are not eligible. With a few exceptions as approved by the respective colleges, a full load for fall and spring semesters is considered to be a minimum of four courses or 16 semester-hours.

There is no dean's list in the School of General Studies.

Grade-Point Average

Numerical equivalents for scholastic averages are weighted according to the number of hours the course carries. For example, suppose a student receives a grade of B in a course carrying 4 semester-hours and a grade of A in a course carrying 1 semester-hour. The weightings are as follows:

Grade	Numerical Equivalent	Semester Hours	Weight
B	3.000	4	12
A	4.000	1	4
Totals:		5	16

The grade-point average for both courses would then be the total weight (16) divided by the total semester-hours (5), or 3.200. Grades of X, I, IP, S, and U are not included in the calculation of the grade-point average.

Grade Reports

Grades are mailed to students approximately three days after the end of each semester. Grades are also available on the Telephone Voice Response System (617.373.8000), the myNEU Web Portal (myNEU.neu.edu), and the on-campus student services kiosks. A missing grade ("*" on grade report) means that none was received from the instructor.

Transcripts

Official transcripts are available upon request at the Transcript Office, 118 Hayden Hall, during regular business hours. Written requests for official transcripts can be mailed to: Transcript Office, 118 Hayden Hall, 360 Huntington Avenue, Northeastern University, Boston, MA 02115-5000. Fax requests are also accepted at 617.373.5351; however, official transcripts are delivered only in person and by mail, not by fax. For further information on what needs to be included in the fax request, please visit www.registrar.neu.edu and click on "transcript requests." All questions concerning transcript requests should be directed to the above address or to 617.373.2199, TTY 617.373.5360. Currently enrolled students may obtain unofficial transcripts from the myNEU Web Portal (myNEU.neu.edu) and at the on-campus student services kiosks.

EXAMINATIONS

Final examinations are held during the last week of each semester. An examination schedule is posted on the Web at www.registrar.neu.edu and on the registrar's official bulletin board on the first floor of Hayden Hall. It is the student's responsibility to know the time and location of each of his or her examinations.

- Students who have a final examination conflict (two examinations at the same hour or three examinations in one day) should go to the Office of the Registrar, 120 Hayden Hall, within the first two weeks of classes.
- Instructors may not give more than one half-hour examination in the week prior to final examinations.
- Final examinations must be held when scheduled by the Office of the Registrar.
- Students must adhere to instructor's rules of conduct during examinations.
- Students who have concerns about exams scheduled during the final week of classes, rescheduling of final examinations, or conduct during an examination should report their concerns to their college dean's office.

ACADEMIC PROGRESSION STANDARDS

Academic Status

Students at Northeastern maintain good academic standing when they meet the following criteria: (1) have an overall GPA of 1.800 at the end of their freshman year and a minimum cumulative GPA of 2.000 at the end of each semester thereafter and (2) earn at least 12 semester-hours in the semester just completed. Individual colleges may have additional requirements that are specified in each college section that follows.

In addition, many programs require that specific courses be successfully completed to progress to the next year. Students who do not make satisfactory progress will not graduate with their class and may be withdrawn. For more information about additional academic progression standards for each college, program, or major, refer to the curriculum guidelines that can be found in the college sections of this catalog.

Academic Probation

Full-time students who fail to meet the criteria for good standing described above will be placed on academic probation effective for the following semester. The action will appear on the internal record, but not on the transcript.

Academic Dismissal

Students who remain on probation for two semesters will be dismissed from the University. This action will appear on the transcript.

Academic Standing Appeals

Students may appeal academic standing status if they can provide documented evidence supporting an appeal. A student on probation may be granted no more than one additional semester to meet the criteria for good academic standing. Students appeal to the College Academic Standing Committee to review probation cases, and to the University Academic Standing Committee for dismissals.

Academic Eligibility for Participating in Student Organizations and Athletics

All students must have a minimum 2.000 overall grade-point average to be eligible for an elected or appointed leadership position in any student organizations. Athletes must adhere to NCAA standards.

Repeating Courses to Clear Deficiencies

Please see “Repeating Courses” and “Clearing an Academic Deficiency” on page 15.

GRADUATION REQUIREMENTS

To be eligible to receive degrees, graduating seniors must meet all academic and residency requirements. They must also clear all financial, cooperative education, and disciplinary deficiencies.

University-wide academic degree requirements are:

- Minimum of 128 semester-hours to graduate with bachelor's degree. Some programs have higher semester-hour requirements.
- An overall GPA of 2.000.
- Students must be in residence 32 of the last 40 semester-hours.
- Satisfaction of the diversity requirement as specified for the student's program.
- Completion of College Writing and Advanced Writing in the Disciplines, with grades of C or better.

In addition, each program of study has specific academic requirements. These are specified for each program in this catalog.

Prior to completion of their program, students are expected to complete a graduation degree audit at their college's Undergraduate Student Services Office.

Graduation with honors and selection as the class marshal (spring commencement only) are reserved for students who have completed 60 semester-hours in residence. To graduate with honors, the student must meet the following GPA requirements.

Grade-point average	Honor conferred
3.250–3.499	Graduate with honor (<i>cum laude</i>)
3.500–3.749	Graduate with high honor (<i>magna cum laude</i>)
3.750–4.000	Graduate with highest honor (<i>summa cum laude</i>)

Attendance at commencement is optional. Information concerning commencement is mailed to all graduating seniors during the spring semester for spring commencement or during the summer semester for fall commencement. Seniors are notified by mail if they fail to qualify for their degrees. No special notice is sent to students who do qualify.

REGISTRATION PROCEDURES

Students are expected to preregister for classes during the published registration times in the academic calendar. Freshmen may be preregistered for some or all of the courses they need. Most registration after the freshman year is accomplished through the Telephone Voice Response System (617.373.8000) or the myNEU Web Portal (myNEU.neu.edu). Confirmations of class registrations are mailed to students prior to the start of classes. Students must complete “I Am Here” registration just prior to the start of classes in order to remain enrolled.

Course Prerequisites

Students are expected to meet prerequisites as listed in the course description of each course in which they enroll. Grades of F, U, I, X, or W in prerequisite courses do not normally fulfill requirements. Exceptions must be authorized by the instructor teaching the course.

Overload Policy

An overload occurs when a student is enrolled in more courses than prescribed by the program's curriculum. To register for an overload, students must obtain permission from their college dean's office. Students who enroll in overload courses will be billed at the overload rate, 1/16 of the full-semester tuition for that semester per semester-hour. Undergraduate full-time students may register for an additional 1 semester-hour course without added charge, as long as they are registered for a full course load.

Reduced Load Policies

A tuition adjustment is made for full-time undergraduate students when they register for fewer than 12 semester-hours in full semesters and 6 semester-hours in half semesters. No rebate or credit is granted when a student voluntarily drops a course. A reduced load may impact the student's housing, financial aid, visa status, and health insurance. Students should consult applicable departments before committing to a reduced load.

Declaring Majors and Minors

Undergraduate students generally declare their majors upon admission to the University or in the spring semester of their freshman year. Majors are described under the various schools and colleges in this catalog.

Students should declare their intent to earn a minor as early as possible, and no later than the end of the junior year, by applying to the department offering the minor.

Double Major or Dual Degree, Double Degree, Second Baccalaureate

Double Major or Dual Major

Students may earn a double major or dual major by completing all requirements for both majors (double major) or the dual degree program specified in this catalog. Students completing a double major or dual degree receive one diploma. The double major or dual major is noted on the transcript. When the two parts of the double major or dual major have different degree designations, such as BSBA and BS, the student chooses which degree designation will appear on the diploma.

Double Degree

To earn two degrees, a student must complete all requirements for both degrees and must complete 30 semester-hours

beyond the semester-hour requirement for the degree with the lesser requirement. Two diplomas will be awarded and both degrees will be noted on the transcript.

Second Baccalaureate

To earn a second baccalaureate, a student must complete all the requirements for the degree and must complete 30 semester-hours beyond the semester-hour requirement for the first baccalaureate degree. A second diploma will be awarded and the second degree will be noted on the transcript.

Internal Transfers

Students wishing to transfer to another college within Northeastern University or to change majors within the same college should consult the office of the dean of the college to which they want to transfer. Transfer to another college is not automatic but is based on a number of factors, including academic achievement and availability of space. Deadlines are at the discretion of the colleges.

Transfer Credits for Current Students

With the approval of the college dean's office, students may take courses in Northeastern's University College, Lowell Institute School, part-time engineering program, or in one of the graduate schools. The courses and grades may be recorded on the transcript at the discretion of the student's college.

Students who want to take courses at another institution and transfer the credit to Northeastern must obtain prior approval from the college dean's office. The student must earn a C (2.000) or better for a course to be considered for transfer.

Special Students

Students who are not enrolled at Northeastern University may petition the college dean's office to take courses on a semester-by-semester basis. Approval is based on the student's academic qualifications and on the availability of class space. If the college dean's office approves the course enrollment, the student pays the bill and then returns the completed forms to the Office of the Registrar.

Class/Cooperative Education Conflicts

Students are billed for tuition when they are expected to be in class. A student scheduled for cooperative education will have any preregistered courses scheduled during that period purged. To avoid this, students must contact their college dean's office or cooperative education coordinator to have their pattern of attendance changed.

A student who wishes to take a course while on co-op must complete a petition form in their college dean's office.

Dropping Courses

Not attending class does not constitute withdrawal. Students must drop the course using processes described below:

In Fall and Spring Semesters

- Through the third week of the semester, students may withdraw without any grade being posted to the transcript. Courses may be dropped using the Telephone Voice Response System (617.373.8000) and the myNEU Web Portal (myNEU.neu.edu).
- Between the fourth and eleventh week, students must complete a course drop form (available at the Office of the Registrar or the college dean's office), and have it signed by their instructor and by a representative of either their college dean's office or the department that offers the course. Students must return the original copy to the Office of the Registrar and keep a copy for themselves. Course withdrawals during this time are indicated by a W on the student's record. A faculty member may choose not to sign a course withdrawal form if a student was involved in any kind of academic dishonesty in the class.
- After the eleventh week, no withdrawals are accepted for any reason. At this point, a letter grade is posted on the transcript.

In Summer Half Semesters

- Through the second week of the half semester, students may withdraw without any grade being posted to the transcript. Courses may be dropped using the Telephone Voice Response System (617.373.8000) and the myNEU Web Portal (myNEU.neu.edu).
- Between the third and fifth week, students must complete a course drop form (available at the Office of the Registrar or the college dean's office), and have it signed by their instructor and by a representative of either their college dean's office or the department that offers the course. Students must return the original copy to the Office of the Registrar and keep a copy for themselves. Course withdrawals during this time are indicated by a W on the student's record. A faculty member may choose not to sign a course withdrawal form if a student was involved in any kind of academic dishonesty in the class.
- After the fifth week, no withdrawals are accepted for any reason. At this point, a letter grade is posted on the transcript.

Late Admission to a Course

Students may petition to register for a course after the second week of a full semester or after the first week of a half semester. Permission may be granted if seats are available and at the discretion of the instructor. If students are not already registered for a full course load, late admissions may jeopardize full-time status.

Forms for late admission are available at the Office of the Registrar and the college dean's office.

PERSONAL INFORMATION

Change of Name

Report all name changes to the Office of the Registrar immediately. This is especially important when students marry and wish to use a new name on University records.

Change of Address

Notify the Office of the Registrar, Customer Service Center, or Office of Student Financial Services promptly of any address change. Both the permanent home address and the local address are needed.

ACCESS TO STUDENT RECORDS

The Family Educational Rights and Privacy Act (FERPA) and Student Records

Notification of Rights under FERPA

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. These rights are:

1. The right to inspect and review the student's education records within forty-five days of the day the University receives a request for access. Students should submit to the registrar, dean, or head of the academic department (or appropriate official) written requests that identify the record(s) they wish to inspect. The University official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the University official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.
2. The right to request the amendment of the student's education records that the student believes is inaccurate or misleading. Students may ask the University to amend a record that they believe is inaccurate or misleading. They should write the University official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading. If the University decides not to amend the record as requested by the student, the University will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.
3. The right to consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent. One exception, which permits disclosure without consent, is disclosure to school officials with legitimate educational interest. A school official is defined as a person employed by the University in an administrative,

supervisory, academic, or support staff position (including law enforcement unit and health staff); a person or company with whom the University has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.

4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the University to comply with the requirements of FERPA. At Northeastern, the Office of the University Registrar, 120 Hayden Hall, administers FERPA.
5. Information concerning the following items about individual students is public and the offices listed below have the most accurate and up-to-date information:
 - Office of the Registrar
(120 Hayden Hall)
Full name, major field of study, dates of attendance, class year, degrees and awards received, most recent previous educational institution attended.
 - Department of Athletics
(219 Cabot Physical Education Center)
Participation in formally recognized University athletics, weight and height of members of athletic teams.
 - Student Activities
(228 Curry Student Center)
Participation in officially recognized University activities and student organizations.

FERPA and the USA Patriot Act

The USA Patriot Act preempts FERPA, described above. The act provides federal law enforcement agencies access to otherwise confidential student records upon the presentation of specified authority. The act also says that the University cannot notify the individual whose records or information is being sought that the request has been made. All requests for student information made under the authority of the USA Patriot Act are handled by the Office of University Counsel, 115 Churchill Hall.

UNIVERSITY WITHDRAWAL

Students seeking to withdraw from the University for any reason should contact the office of the dean of their college.

Students may be withdrawn from the University for financial, disciplinary, academic, or health reasons. In the last case, a committee will review the recommendations of the director of health services to determine whether the student should withdraw. The student has an opportunity to present his or her case to the committee. Withdrawals are made only when it is determined that the student is a danger to himself or herself or to other members of the University community, or when the student has demonstrated behavior detrimental to the educational mission of the University.

LEAVE OF ABSENCE

General Leave of Absence Policy

Students who wish to take a leave of absence are encouraged to apply for the leave by filling out the proper petition with their college one month prior to the start of the effective semester. The usual limit for a leave of absence is for one or one and a half academic semesters (a semester plus a half semester). A leave of absence, if approved, will take into account the following conditions:

- Students who do not return at the end of the leave will be withdrawn and must submit a petition for subsequent readmission to the program.
- Students must return to classes, not co-op.
- Students must be currently enrolled in academic courses or co-op. If a student is withdrawn for any reason, a request for a leave of absence cannot be considered until the withdrawal is resolved.
- Students who receive financial aid should meet with a financial aid counselor before going on a leave.
- Students in University housing should refer to the Office of Residential Life for policy information.
- Students' enrollment status cannot include more than one academic year of consecutive nonclass enrollments.
- After the eleventh week of a full semester or after the fifth week of a half semester, a student may apply for a leave of absence only for medical reasons or due to military deployment.

Students returning from an approved leave of absence must submit a notification of intent to return to their college student services office no later than one month prior to the start of the semester in which they intend to return. Students are required to preregister for courses upon returning from a leave of absence.

Medical Leave of Absence

A student taking a leave of absence from academic work for medical reasons must contact the college dean's office. Medical reasons are considered to include both physical and emotional well-being. A representative of the dean's office will discuss the situation with the student and refer the student to the Lane Health Center with a petition form. The petition for medical leave of absence must be made prior to the end of the semester. The student's physician must provide appropriate medical information to the Lane Health Center physician. A student who is on co-op when he or she needs a medical leave of absence must contact the co-op coordinator.

A medical leave of absence may be effective for up to six months. During this period the student maintains all the rights and responsibilities of a Northeastern University student. If the student is covered under the Northeastern-sponsored Blue Cross/Blue Shield insurance, it remains in effect. If the student does not obtain permission to reenter by the end of six months, he or she will be withdrawn from the University.

When the student is ready to return to the University, he or she must again contact the appropriate college representative, who in turn refers the student to the Lane Health Center. The center must be provided with medical documentation validating the treatment and the student's fitness to return to school. Strict confidentiality is maintained in all aspects of medical leaves of absence. Exceptions to these procedures are handled by the appropriate academic standing committee.

Leave of Absence Due to Military Deployment

When a student in the U.S. Reserves or in the National Guard is called to active duty or when an international student is called to active duty in his or her home country, the student must notify his or her college dean's office and provide proof of deployment prior to being deployed. The proof may be faxed, mailed, or hand-carried to the college dean's office. It may take the form of general orders cut by the company commander.

When a student is activated during the semester, the University will:

- excuse tuition for that semester. Any payment made will be credited to the student's account.
- expunge the student's record of registration so that the student is not penalized for being called to active duty.

If a student is called to active duty near the end of the semester, the student and faculty members may determine that incomplete (I) grades are more appropriate. In this case, tuition will not be waived.

When a student returns to the University after completion of the tour of duty, he or she will notify the college dean's office. The college dean's office will assist the student with reentry and registration.

Academic Programs and Curriculum Guide

COOPERATIVE EDUCATION**DOREEN L. HODGKIN, MEd, *Senior Associate Dean*****CANDACE A. HERENE, BA, *Assistant Dean*****PATRICIA A. VENTER, BS, *Diversity Coordinator*****ASSOCIATE PROFESSORS****Betsey W. Blackmer, PT, EdD****Elizabeth A. Chilvers, MEd****Ann M. Galligan, EdD****Stephen M. Kane, EdD****Melvin W. Simms, EdD****Robert Tillman, EdD****ASSISTANT PROFESSORS****Veronica L. Porter, MEd****William A. Sloane, MBA****ASSOCIATE COOPERATIVE EDUCATION COORDINATORS****Robert J. Blaser, RPh, MS****Charles Bognanni, MEd****Alicia A. Canali, MEd****Martha F. Connors, MSN****Jacqueline Diani, MEd****Rosemarie DiMarco, MS****Jean F. Egan, MEd****Mark Erickson, MEd****Pamela W. Goodale, MA****Clinton R. Holland, MS****Karen P. Kelley, MEd****George F. Kent, MBA****Kellianne Murphy, MA****Behrooz (Barry) Satvat, PE, ScD****Jacqueline F. Sweeney, MS****Scott Weighart, MBA****William E. Wray, JD****Mark L. Yorra, RPh, MS****ASSISTANT COOPERATIVE EDUCATION COORDINATORS****Filomena M. Borba, MS****Anne Brady, MS****Richard C. Conley, MA****Cynthia A. Crespin, MSEd****Kimberly C. Eldred, MS****Lisa M. Foster, MS****Nancy Geoffrion, MEd****Michelle L. Israel, MS****Nora K. Jemison, MEd****Mary Kane, MEd****Lester P. Lee Jr., MA****Patricia B. Leonard, MEd****Kathryn Malloy, MS CCC-SLP****Dianne E. Matos, MA****Katherine Meller, MEd****William Munze, MS****Linda O'Connor, MS****David Potter, MSEE****Yvonne F. Rogers, MS****Jacqueline Salcedo, JD****Robert B. Sherman, PhD****Maria K. Stein, MEd****Kathy M. Tanner, MEd****Nancy Tavares, MSW, LICSW****Lorraine A. Walsh, MSME****Stephen Williams, JD****Lynn H. Yaffee, MEd**

Cooperative education is a key component of a Northeastern University education. The cooperative education curricula leading to the baccalaureate degree generally require five years at Northeastern University. Programs typically consist of a freshman year of two consecutive semesters of full-time study followed by four upperclass years in which students alternate periods of classroom study with six-month cooperative education experiences. At graduation, students in the cooperative education program will have twelve to eighteen months of work experience. All of the colleges except the Bouvé College of Health Sciences also offer a four-year co-op option.

Cooperative education is based on the principle that what students learn in the workplace is a valuable complement to what they learn in the classroom. Studies show that reinforcing classroom learning with job responsibilities increases a student's motivation and self-confidence. Greater interest in academic work develops when students are able to see the link between the co-op experience and classroom study. The academic faculty and cooperative education coordinators have worked together to create Integrated Learning Models that reinforce and leverage the experiences that students have in the classroom and in the workplace.

Co-op students also have opportunities to evaluate career decisions early in their college years, while gaining meaningful work experience before graduation and establishing valuable professional contacts and references. Students also earn experiential learning credit by satisfactorily completing the required components of the cooperative education learning process, and the salaries students earn may help defray a portion of the cost of their education.

Responsibility for all phases of the co-op program rests with the cooperative education faculty. In general, co-op experiences become increasingly challenging and career-specific as students continue their education and acquire greater skills. With permission from their cooperative education coordinator, students may use their co-op period for study abroad, for volunteer work, or to take specialized courses at another institution.

International Cooperative Education

The Department of International Cooperative Education offers a variety of services to international students as well as to U.S. citizens. Through the International Exchange Program, undergraduates may be placed abroad for their cooperative work experience. Placements are available in Europe, Australia and New Zealand, and Israel for students who have the appropriate background and experience.

In addition, the department helps to prepare international students for co-op placements in the United States and in their home country.

Co-op Policies

Co-op start and end dates and college-specific policies may be found in the *Co-op Handbook*. Listed here are general policies regarding participation in the cooperative education program.

- Students must maintain the GPA required by their college to qualify for co-op. Students with deficiencies in course work or GPA should arrange a remedial schedule with their academic adviser and co-op faculty member. They will not be permitted to have a co-op placement until the deficiencies have been eliminated.
- Students must register for co-op just as they register for academic classes. Students register for eight semester hours of experiential learning credit for fall or spring semester and four semester hours of experiential learning credit for each summer half semester.
- Students earn grades of Satisfactory (S), Unsatisfactory (U), or Incomplete (X). Although experiential learning credit is not added to the academic credit hours required for graduation, students' transcripts reflect their grades for each co-op placement.
- Students do not pay tuition for co-op.
- Students who are not registered for co-op or for academic course work will be withdrawn from the University. Withdrawal may affect eligibility for financial aid and, for international students, visa status.

HONORS PROGRAM

The University offers to qualified students a comprehensive Honors Program designed to foster high intellectual development and achievement. The program provides numerous academic course options as well as cultural events for students from all colleges at the University. Entering freshmen are invited to join the program based on their high school record and academic preparation, and current students may join after certain semesters when they have a cumulative 3.400 grade-point average.

The program provides a rich academic experience for students. At the freshman and sophomore levels, selected honors sections are available in place of larger introductory

courses. In honors sections, course material is covered more intensively in a classroom setting with fewer students and greater opportunities for student-faculty interaction. At the sophomore and middler levels, these seminars are designed specifically for honors students. They focus on contemporary issues as well as topics related to the University's mission as a place of scholarship and inquiry in an urban setting. Honors students also may enroll in a one-credit honors adjunct attached to an existing nonhonors course. In an honors adjunct, students and the professor meet outside of class to engage in additional discussions and projects to explore course work in greater depth. And finally, honors students complete a junior/senior honors project as a culminating experience in their academic field. The junior/senior honors project typically involves an independent research project or a set of courses designed for upperclass honors students.

Honors students may earn one of three Honors Program distinctions. Honors course distinction is earned after completion of six honors courses in the semester system, including one honors seminar. College honors project distinction is earned after completion of the junior/senior honors project. University Honors Program distinction is earned after completing requirements for both of the previous distinctions. These distinctions appear on a student's transcript and in the commencement program.

The program offers cultural opportunities, including theatre, ballet, symphony, and sporting events tickets, at subsidized prices. The honors experience at Northeastern also includes special housing opportunities and facilities for study and interaction with other honors students. An honors residence hall is available primarily for freshmen and sophomores and includes a computer lab and study rooms as well as special activities. The Honors Program office, 1 Nightingale Hall, also offers a lounge and computer room for honors students who live on or off campus.

For more information about the Honors Program, including up-to-date listings of honors courses, please consult the program's Web site at www.honors.neu.edu or contact the staff at 617.373.2333.

ROTC, MILITARY OFFICERS' TRAINING PROGRAM

The Department of Military Science offers the Reserve Officers' Training Corps (ROTC) program. The goal of the program is to develop leadership potential in men and women and to prepare them for an officer's commission in the military service of the United States. The curriculum teaches principles of personnel management and seeks to develop leadership traits such as teamwork, ready acceptance of responsibility, desire to achieve, self-confidence, and discipline.

Army ROTC Program

THOMAS M. CREA, LTC, U.S. ARMY, MCS

Professor and Chair, Department of Military Science

ASSISTANT PROFESSORS

Dana P. Barrette, MAJ, BS

Malcolm S. Burr, LTC, BS

Nathan P. Gruver, CPT, BS

Michael F. Howe, MAJ, MS

Sarah L. Johnson, MAJ, BS

Philip M. Peck, MAJ, BA

Nina Reyes-Richard, MAJ, BA

Brett P. Tashiro, CPT

John D. Williamson, MAJ, MBA

INSTRUCTORS

Christopher Carter, MSG

James Zadra, SFC

The Army ROTC program is conducted at Northeastern University. For more information, write the Department of Military Science, 335A Huntington Avenue, Northeastern University, Boston, MA 02115, or call 617.373.2372.

Completion of the Army ROTC program may lead to a commission as a second lieutenant in the United States Army, United States Army Reserve, or the Army National Guard. The program consists of the basic course (freshman and sophomore years) and advanced (middler through senior years) course. The program does not conflict with co-op schedules.

Enrollment in the basic course is voluntary and is open to all full-time students. However, only formally enrolled cadets may participate in leadership labs and other exercises. Students in the basic course do not incur a military obligation.

The advanced course is open to all qualified students who have basic course credit or equivalent military experience, as well as meet the Army's physical, medical, and age requirements. Contracted students (advance course and scholarship) receive a monthly cash stipend while in school. Scholarship students also receive \$17,000 and an additional grant of 20 percent tuition per year, as well as \$600 for books. Scholarships are merit-based.

Air Force and Navy Nurse ROTC Programs

The Air Force and Navy Nurse ROTC programs are conducted at Boston University.

For more information about the Air Force ROTC program, write the Department of Aerospace Studies, Boston University, 118 Bay State Road, Boston, MA 02215-1501, or call 617.353.4705.

For more information about the Navy ROTC Nurse program, write the Office of the Commanding Officer, NROTC Unit, Boston University, 116 Bay State Road, Boston, MA 02215-1796, or call 617.353.2535.

UNIVERSITY-WIDE WRITING REQUIREMENT

The faculty expect all students to become effective writers in their disciplines. To help ensure this, two writing courses are required of all full-time undergraduate students: College Writing and Advanced Writing in the Disciplines.

All freshmen take College Writing, ENG U111. Entering freshmen write a diagnostic essay during summer orientation. Based on that essay, some students will first be placed into Introductory Writing, ENG U110. They must also complete ENG U111. Students whose first language is not English may be placed into Introductory Writing-SOL, ENG U101, and must also complete College Writing-SOL, ENG U102, to satisfy the requirement. Students must earn a grade of C or better in College Writing to satisfy the requirement.

Once students have earned 64 semester hours of academic credit, they are expected to register for the second half of the University-wide writing requirement: Advanced Writing in the Disciplines. Students are encouraged to complete this requirement before they have accrued 96 semester hours. They must earn a C or better in this course to satisfy the requirement. Transfer credit cannot be used to satisfy this requirement.

DIVERSITY REQUIREMENT

Northeastern University requires that all students complete a diversity requirement before graduation. The requirement may be fulfilled by completing a preapproved course or by participation in an activity such as international co-op, study abroad, or diversity training. Each college has developed its own program to satisfy this requirement, so please consult your college for more details.

THE ACADEMIC COMMON EXPERIENCE

In June 1995, Northeastern University adopted the Academic Common Experience (ACE), a new general education model for all undergraduate programs. In ACE, the faculty identified a set of shared general education goals for all students in all majors. The ACE shared goals are:

- *Skills:* Effective thinking, effective communication, information literacy, and interpersonal skills.
- *Contexts:* The natural world, and the social/cultural world.
- *Perspectives:* The historical, the ethical, the aesthetic, and the personal.
- *Connections:* Across disciplines, between the theoretical and the applied, between the academy and the world of work, and between college study and lifelong learning.

The Northeastern faculty, administrators, and students who worked together to create ACE believe that the best education instills a spirit of inquiry, a love of learning, and a habit of reflective thought. It prepares students for the future by enabling them to build on the knowledge they have already

acquired. It also helps develop skills and understanding that can be transferred from one academic discipline to another and from the classroom to life experiences.

Course content and course assignments throughout the program of study reflect these shared goals. As students progress through their individual academic and cooperative education programs, progressive and cumulative learning reinforces and broadens understanding and appreciation of these goals, both personally and professionally.

ABOUT SAMPLE CURRICULA

Each major description includes a sample of the curriculum a student might follow to meet degree requirements. These sample curricula are for general information. Course requirements, elective course distribution, and achievement levels vary from program to program, and even from class to class. Consult with your academic advising office, listed below, to make certain you have all the necessary resources before planning your own curriculum.

College of Arts and Sciences, Dean's Office	100 Meserve
Academic Program Offices	
African-American Studies	132 Nightingale
American Sign Language– English Interpreting	405 Meserve
Architecture	151 Ryder
Behavioral Neuroscience	125 Nightingale
Biochemistry	414 Mugar
Biology	414 Mugar
Chemistry and Chemical Biology	102 Hurtig
Communication Studies	101 Lake
Economics	301 Lake
Education	54 Lake
English	406 Holmes
Geology/Environmental Geology	14 Holmes
History	249 Meserve
Human Services	33 Lake
Interdisciplinary Studies	9 Holmes
International Affairs	303 Meserve
Journalism	102 Lake
Linguistics	563 Holmes
Mathematics	567 Lake
Modern Languages	400 Meserve
Music	351 Ryder
Philosophy and Religion	371 Holmes
Physics/Applied Physics/ Biomedical Physics	111 Dana
Political Science	303 Meserve
Psychology	125 Nightingale
Sociology and Anthropology	500 Holmes
Theatre	337 Ryder
Visual Arts	239 Ryder

Bouvé College of Health Sciences	120 Behrakis
College of Business Administration	250 Dodge
College of Computer and Information Science	161 Cullinane
College of Criminal Justice	204 Churchill
College of Engineering	220 Snell
School of Engineering Technology	120 Snell
School of General Studies	249 Ryder

Special Notes

- One semester-hour of credit is equal to fifty minutes of instruction per week, plus two hours of preparation.
- The Office of the Registrar, 120 Hayden Hall, maintains the official record for all courses. In the event of error in any publication, the academic record will reflect the correct semester hours applicable to any degree requirement.
- On occasion, course titles change, while the course number remains the same. Despite such title changes, the course is still considered to be the same course. Students who have taken the course under the old title and then take the course again under the new title are considered to have repeated the course.

UNDERGRADUATE COURSE NUMBERING SYSTEM

Every semester course number at Northeastern University consists of three parts:

- A two- or three-letter department code
- A single-letter code, most commonly U indicating an undergraduate course or G indicating a graduate course
- A three-digit number

For example, in the course number ECN U115, ECN is the department code, U indicates an undergraduate course, and 115 is the three-digit number.

For undergraduate courses, the three-digit number indicates the level of the course as follows:

001–099	Basic/preparatory
100–299	Introductory
300–499	Intermediate
500–699	Advanced
700–799	Research, thesis, capstone
900–999	Special course work (directed study, independent study, special topics, seminar, workshop, or practicum)

UNDERGRADUATE DEGREES

Listed below are the degrees conferred by the undergraduate full-time day colleges at Northeastern University.

College of Arts and Sciences

Bachelor of Arts

Bachelor of Science

Bouvé College of Health Sciences

Bachelor of Science

Bachelor of Science in Nursing

Bachelor of Science in Rehabilitation Science

Bachelor of Science in Toxicology

Master of Science in Physical Therapy

Doctor of Pharmacy (six-year program)

College of Business Administration

Bachelor of Science in Business Administration

Bachelor of Science in International Business

College of Computer and Information Science

Bachelor of Arts in Computer Science

Bachelor of Science in Computer Science

Bachelor of Science in Information Science

Bachelor of Science (dual majors only)

College of Criminal Justice

Bachelor of Science

College of Engineering

Bachelor of Science in Chemical Engineering

Bachelor of Science in Civil Engineering

Bachelor of Science in Computer Engineering

Bachelor of Science in Electrical Engineering

Bachelor of Science in Industrial Engineering

Bachelor of Science in Mechanical Engineering

School of Engineering Technology

Bachelor of Science in Engineering Technology

MAJORS AND CONCENTRATIONS

Listed below are the majors and, where applicable, concentrations offered by the undergraduate full-time day colleges at Northeastern University. In some cases, the academic area under which the major is listed in this catalog is indicated parenthetically.

College of Arts and Sciences

African-American Studies

American Sign Language

Anthropology (*listed under Sociology and Anthropology*)

Applied Physics (*listed under Physics*)

Architecture

Art (*listed under Visual Arts*)

Concentration in Animation

Concentration in Photography

Behavioral Neuroscience

Biochemistry

Biology

Biomedical Physics

Chemistry

Communication Studies

Concentration in Media Studies

Concentration in Organizational Communication

Concentration in Public Communication

Cultural Anthropology (*listed under Sociology and Anthropology*)

Economics

English

Environmental Geology (*listed under Geology*)

Environmental Studies

French (*listed under Modern Languages*)

Geology

Graphic Design (*listed under Visual Arts*)

History

Concentration in Public History

Human Services

International Affairs

Journalism

Linguistics

Mathematics

Multimedia Studies

Concentration in Animation

Concentration in Photography

Concentration in Graphic Design

Concentration in Music Technology

Music

Concentration in Literature

Concentration in Literature and Performance

Concentration in Music Industry

Concentration in Music Technology

Philosophy

Concentration in Law and Ethics

Concentration in Religious Studies

Physics

Physics, Applied (*listed under Physics*)

Physics, Biomedical (*listed under Biomedical Physics*)

Political Science

Concentration in Law and Legal Issues

Concentration in International and Comparative Politics

Concentration in Public Policy and Administration

Psychology

Sociology (*listed under Sociology and Anthropology*)

Spanish (*listed under Modern Languages*)

Theatre

Concentration in Performance

Concentration in Production

Dual Majors

Cinema Studies and Communication Studies (*listed under Cinema Studies*)
 Cinema Studies and English (*listed under Cinema Studies*)
 Cinema Studies and Journalism (*listed under Cinema Studies*)
 Cinema Studies and Modern Languages (*listed under Cinema Studies*)
 Cinema Studies and Theatre (*listed under Cinema Studies*)
 Computer Science and Cognitive Psychology (*listed under Computer Science*)
 Computer Science and Mathematics (*listed under Computer Science*)
 Computer Science and Physics (*listed under Computer Science*)
 Linguistics and English (*listed under Linguistics*)
 Linguistics and Psychology (*listed under Linguistics*)

Bouvé College of Health Sciences

Athletic Training
 Cardiopulmonary and Exercise Sciences
 Concentration in Respiratory Therapy
 Concentration in Exercise Physiology
 Clinical Exercise Physiology (*listed under Cardiopulmonary and Exercise Sciences*)
 Medical Laboratory Science
 Physical Therapy
 Speech-Language Pathology and Audiology
 Nursing
 Pharmacy
 Toxicology

College of Business Administration

Concentrations
 Accounting
 Entrepreneurship and Small Business Management
 Finance and Insurance
 Human Resources Management
 International Business (BSIB only)
 Management
 Management Information Systems
 Marketing
 Supply Chain Management

College of Computer and Information Science

Computer Science
 Information Science

Dual Majors

Computer Science and Cognitive Psychology (*listed under Computer Science*)
 Computer Science and Mathematics (*listed under Computer Science*)
 Computer Science and Physics (*listed under Computer Science*)

College of Criminal Justice

Criminal Justice

College of Engineering

Chemical Engineering
 Civil Engineering (*listed under Civil and Environmental Engineering*)
 Computer Engineering (*listed under Electrical and Computer Engineering*)
 Electrical Engineering (*listed under Electrical and Computer Engineering*)
 Electrical/Computer Engineering (*listed under Electrical and Computer Engineering*)
 Industrial Engineering (*listed under Mechanical, Industrial, and Manufacturing Engineering*)
 Mechanical Engineering (*listed under Mechanical, Industrial, and Manufacturing Engineering*)

School of Engineering Technology

Computer Engineering Technology
 Electrical Engineering Technology
 Mechanical Engineering Technology

MINORS

Listed below are the minors offered by the undergraduate full-time day colleges at Northeastern University. In some cases, the academic area under which the minor is listed in this catalog is indicated parenthetically.

College of Arts and Sciences

African-American Studies
 Animation (*listed under Visual Arts*)
 Anthropology (*listed under Sociology and Anthropology*)
 Architectural History (*listed under Architecture*)
 Art (*listed under Visual Arts*)
 Biology
 Biology, Marine (*listed under Biology*)
 Chemistry
 Cinema Studies
 Communication Studies
 Cultural Anthropology (*listed under Sociology and Anthropology*)
 East Asian Studies (*listed under Interdisciplinary Minors*)
 Economics
 English Literature (*listed under English*)
 English Writing (*listed under English*)
 Environmental Geology (*listed under Geology*)
 Environmental Studies
 French (*listed under Modern Languages*)
 Geology
 Graphic Design (*listed under Visual Arts*)
 History
 Human Services
 International Affairs
 Jewish Studies (*listed under Interdisciplinary Minors*)
 Journalism

Latino, Latin American, and Caribbean Studies (*listed under Interdisciplinary Minors*)

Linguistics

Literature (*listed under English*)

Marine Biology (*listed under Biology*)

Marine Studies (*listed under Interdisciplinary Minors*)

Mathematics

Middle East Studies (*listed under Interdisciplinary Minors*)

Music

Music Industry (*listed under Music*)

Music Theatre (*listed under Music*)

Philosophy

Photography (*listed under Visual Arts*)

Physics

Political Science

Psychology

Religious Studies (*listed under Philosophy*)

Sociology (*listed under Sociology and Anthropology*)

Spanish (*listed under Modern Languages*)

Technical Communications (*listed under English*)

Theatre

Urban Studies (*listed under Interdisciplinary Minors*)

Women's Studies (*listed under Interdisciplinary Minors*)

Writing (*listed under English*)

Bouvé College of Health Sciences

Clinical Chemistry (*listed under Medical Laboratory Science*)

Hematology (*listed under Medical Laboratory Science*)

Immunohematology (*listed under Medical Laboratory Science*)

Immunology (*listed under Medical Laboratory Science*)

Microbiology (*listed under Medical Laboratory Science*)

College of Business Administration

Business Administration

College of Computer and Information Science

Computer Science

Information Science

College of Engineering

Biomedical Engineering (*listed under Electrical and Computer Engineering*)

Computer Engineering (*listed under Electrical and Computer Engineering*)

Electrical Engineering (*listed under Electrical and Computer Engineering*)

School of Engineering Technology

Computer Engineering Technology

Electrical Engineering Technology

Mechanical Engineering Technology

College of Arts and Sciences

JAMES R. STELLAR, PHD, *Dean*

Timothy Donovan, PhD, *Associate Dean, External Affairs*

Luis M. Falcon, PhD, *Interim Associate Dean, Faculty Affairs,
and Director of the Graduate School*

Dawn Anderson, MA, *Coordinator, International Programs*

Bruce Ronkin, DMA, *Interim Associate Dean, Undergraduate
Affairs*

Kimberly Irmiter, MA, *Coordinator, Academic Student Services*

Gail F. Leclerc, MEd, *Academic Adviser*

Kate McLaughlin, MA, *Associate Director, Experiential Education*

Mary Mello, MA, *Director, Academic Student Services*

TBA, *Associate Director, International Study Programs*

Andresse St. Rose, MA, *Academic Adviser*

Gail Stubbs, MEd, *Senior Associate Director, Academic Student
Services*

Jan Swindlehurst, MFA, *Coordinator, Academic Student Services*

Carolyn Ketchum, MA, *Academic Adviser*

A broad study of disciplines in the arts and sciences is the core of higher education. Most students in the University—no matter what career training they choose—devote a substantial portion of their studies to the arts and sciences.

The college as a whole emphasizes general education through the college core curriculum. In addition, a large number of interdisciplinary and extradisciplinary programs are available. These include national and international programs for study and experience; programs in field settings at sea and abroad; and programs involving affiliations in such areas as professional performing arts organizations, media organizations, and government offices. The college also emphasizes experiential education through cooperative education, service learning, and other kinds of internships, student-faculty research collaborations, and study abroad.

Students may choose a four- or five-year experiential education plan in most programs. Either plan offers co-op opportunities for paid employment, often in an area related to the student's chosen academic area. Students are normally eligible to participate in co-op in the second semester of their sophomore year and after they have declared a major.

Students may enter the college with a specified major or with an unspecified liberal arts major preference (LAMP). Students in the LAMP program, however, are strongly encouraged to declare a major, particularly if they are interested in the co-op program, by the beginning of the sophomore year. Considerable flexibility exists, and many students change majors during the first two years. The college offers a Bachelor of Arts degree and a Bachelor of Science degree in most programs. In general, the Bachelor of Arts degree requires more college core curriculum courses as well as a foreign language or American Sign Language. The Bachelor of Science degree requires fewer core curriculum courses but more work in the specific majors.

Many programs are flexible enough to allow students to pursue a double major, and the college offers a number of specific integrated dual-major programs. In order to facilitate students' ability to pursue either a double major or an integrated dual major, the college allows unlimited double counting between major and core curriculum courses, as well as more flexibility in the core curriculum. In addition, the college offers the option of an independent major for students whose interests and goals are not met by a specific major program.

Class Entrance Requirements

In order to make normal progress, students in the College of Arts and Sciences are expected to maintain a minimum cumulative grade-point average of 2.000 and to earn

16 semester hours of credit each semester. Some majors have additional specific requirements in order to progress from year to year.

Transferring to Arts and Sciences Majors

Students wishing to transfer into arts and sciences majors should consult with the Center for Experiential Education and Academic Advising (CEA) in 1 Meserve Hall. Although students may meet transfer criteria, acceptance into certain majors is also based on space availability.

Graduation Requirements

Quantitative. Candidates for either the Bachelor of Arts (BA) or Bachelor of Science (BS) degree must successfully complete a minimum of 128 semester hours.

Qualitative. Candidates must achieve a minimum cumulative average of 2.000 (grade of C).

Transfer credit. Transfer credit is granted initially for courses that fulfill major, college, or elective requirements in an arts and sciences program. Courses must be from an accredited college or university, and credit will be granted only for courses in which the student earned a grade of at least C (2.000). Courses taken pass/fail are not eligible for transfer credit. To receive credit for courses in progress at the time of application, the student must submit an updated official transcript for review once grades for the courses have been posted. Students should contact a major or dean's office adviser prior to enrollment or during their first semester to have transfer credits evaluated, both for major and college requirements. Students who believe that they should be granted additional transfer credit should consult with an academic adviser in Meserve Hall.

Core curriculum. All students in the College of Arts and Sciences must complete the college's core curriculum in order to graduate. The core curriculum is a set of course requirements intended to offer the breadth of experience essential to a well-rounded individual and the broad base of knowledge traditionally associated with a liberal arts education, as well as to promote lifelong learning. The core curriculum complements students' major programs by providing opportunities to present ideas from other disciplines found in the arts, humanities, mathematics, social sciences, and sciences. The college believes that the core curriculum should enhance students' critical reading, writing, thinking, and communication skills; introduce the foundational methods of perception and inquiry; engage interest in the analytical and integrative tools used in disciplines outside the students' major; and encourage constructive thought about identity and respect for other ethnic and cultural heritages. Instruction in core courses strives to emphasize the critical skills, reflective thought, and ethical standards that form the basis of a well-educated, productive, creative, and intellectually responsible citizen.

The college core requirements, combined with the students' major requirements, enable Arts and Sciences students to satisfy the University's academic common experience (ACE) and diversity objectives for all undergraduate curricula.

The core curriculum encompasses the following areas:

- English. College writing (one or two courses depending on placement level upon entry to the University) and one advanced writing in the disciplines (AWD) course (Core Category I)
- Mathematics. One to three courses depending on placement level upon entry to the University (Core Category I)
- Foreign Language. A modern language or American Sign Language (one full year of college-level study required of all Bachelor of Arts candidates) (Core Category I)
- Methods of Inquiry. Arts context, humanities context, natural world context, and social world context (Core Category II)
- Diversity. (Core Category III)
- Historical, Ethical, and Aesthetic Perspectives. (Core Category IV)
- Analysis. (Core Category V)

For placement information on college writing, college mathematics, modern languages, or American Sign Language, students should consult the appropriate department or the Center for Experiential Education and Academic Advising (CEA), 1 Meserve Hall.

Descriptions for all College of Arts and Sciences courses begin on page 189. Courses approved for the college's core curriculum are listed beginning on page 40. Students are required to complete courses in each category of the core, depending on the major and degree pursued.

Experiential education requirement. All Arts and Sciences students are required to fulfill the college's experiential education requirement. This requirement has two components: (1) an *approved* experiential activity (that is, co-op, internships, undergraduate research, fieldwork or practica, study abroad, community service, and others), and (2) a reflective academic component that integrates the experiential piece into the student's academic studies. Students are considered to have fulfilled the requirement only when both components have been satisfactorily completed. Although the experiential requirement does not need to be fulfilled in the student's major, each department does have options for fulfilling the requirement.

Academic departments and program offices have information about planning for and completing the experiential education requirement in their majors, and department experiential education advisers are available to answer questions and advise students on how best to fulfill it.

Foreign language. All Bachelor of Arts degree candidates must demonstrate proficiency in a modern foreign language or

American Sign Language. To satisfy the requirement, students must complete two semesters of the language with grades of C or better in all courses. No language course that will be used to satisfy the requirement may be taken pass/fail. Students may also satisfy the language requirement by meeting a comparable criterion established by the Department of Modern Languages and the American Sign Language Program. This criterion requires that a student provide evidence of having been educated in the language at the high school level or equivalent.

Conditional exemption from this requirement may be granted to students who earned an average of C or better in a full, four-year language sequence in secondary school. A conditional exemption must be confirmed by taking a proficiency examination during the first semester at the University. A sufficiently high score will verify the exemption; otherwise, the student will be advised of the appropriate language course to take in the following semester.

Absolute exemption is granted to students for whom English is a foreign language or who receive a score of 550 or better in the Language Achievement Examinations.

The normal sequence for students with no prior preparation is one year of college-level course work in a language. The Department of Modern Languages or the American Sign Language Program will determine an appropriate entry point at which students who have partial language preparation may begin completing the requirement. Students who plan to use German, Russian, or Italian to fulfill the foreign language requirement should begin study as early as possible; the college is not able to offer these courses on a regular basis.

Advanced Writing in the Disciplines (AWD). The advanced writing in the disciplines requirement may not be fulfilled until the student has successfully completed at least 64 semester hours (including transfer credit). It is strongly suggested that students finish their AWD requirement before beginning their final year of course work. The requirement must be fulfilled in the full-time day programs at Northeastern. The College of Arts and Sciences strongly recommends Advanced Writing in the Disciplines, ENG U301, to complete the AWD requirement. Students may, however, also satisfy the requirement by completing one of the following courses with a grade of C or better:

ENG U302	Advanced Writing in the Technical Professions
ENG U303	Advanced Writing in the Environmental Professions
ENG U304	Advanced Writing in the Business Administration Professions
ENG U305	Advanced Writing in the Criminal Justice Professions
ENG U306	Advanced Writing in the Health Professions
HST U302	Historical Writing
JRN U301	Journalism 3

Students not participating in the cooperative education program should complete the AWD requirement in their junior year.

INTERDISCIPLINARY STUDIES

The Center for Interdisciplinary Studies in the College of Arts and Sciences offers students the opportunity to study in a broad range of interdisciplinary programs suited to their curricular or career objectives and also permits students to design their own independent programs of study. The center is a resource for students who want to obtain more information about the various interdisciplinary programs, apply for interdisciplinary scholarships, join our affiliated academic organizations, enroll in special courses, and participate in our innovative community partnerships.

The center also supports and coordinates the individual programs. There are approximately twenty interdisciplinary programs within the College of Arts and Sciences and negotiations are ongoing to develop new undergraduate programs. Interdisciplinary programs consist of freestanding majors, dual majors, minors, and concentrations. This vast array permits students the flexibility to design their own interdisciplinary studies, to complete dual and double majors, to explore the boundaries at the cutting edge of existing disciplines, and to explore areas of secondary or personal interest and nontraditional courses of study. For more information on the programs, contact the Center for Interdisciplinary Studies (9 Holmes) at 617.373.2427 or the individual program directors. The interdisciplinary programs of the college follow.

Interdisciplinary Majors

Behavioral Neuroscience	See page 50.
Biochemistry	See page 52.
Cinema Studies* (dual majors)	See page 58.
Environmental Studies*	See page 70.
Human Services*	See page 76.
International Affairs*	See page 78.
Linguistics*	See page 82.

*A minor is also available.

Double Majors

Students with interests in two separate fields have traditionally pursued both by enrolling in a double major. A double major allows students to combine two majors of their choice. Students pursuing double majors complete all major requirements in both majors, the Bachelor of Science degree version of the college core curriculum, and the Bachelor of Arts degree language requirement (if pursuing a Bachelor of Arts degree). The college also allows unlimited double counting across core curriculum and major requirements for students in double majors.

Dual Majors

The integrated dual major allows students to link concepts across disciplinary boundaries. Dual-major options are limited to those combinations for which faculty from two majors have identified nine or more courses from each major, plus an additional one or two "capstone" or integrative courses, that

specifically help students link the concepts learned in both majors. As with double majors, students pursuing dual majors complete the Bachelor of Science degree version of the college core curriculum and the Bachelor of Arts degree language requirement (if pursuing a Bachelor of Arts degree), and there can be unlimited double counting between the core curriculum and major requirements. Fulfilling the college's experiential education requirement (see page 30) provides an additional opportunity for supervised work linking the two areas of study. Currently, the following dual majors are offered within the College of Arts and Sciences:

Cinema Studies and English
 Cinema Studies and Communication Studies
 Cinema Studies and Journalism
 Cinema Studies and Modern Languages
 Cinema Studies and Theatre
 Linguistics and English
 Linguistics and Psychology

The following dual majors are offered by the College of Arts and Sciences in conjunction with other colleges at the University:

Cognitive Psychology (Cognitive Psychology concentration) and Computer Science (College of Computer Science)
 Mathematics and Computer Science (College of Computer Science)
 Physics and Computer Science (College of Computer Science)

Students interested in these dual majors should contact the participating college or department, or consult interdisciplinary major details. Information may also be obtained at the Center for Interdisciplinary Studies, 9 Holmes Hall, 617.373.2427. Other dual majors, both within the College of Arts and Sciences and across colleges, are currently under development or undergoing the University's review process.

Teacher Training

All teacher-training programs in the College of Arts and Sciences require that students combine an Arts and Sciences major with a program in early childhood education or elementary education, certification in special education, or minor in secondary education at the School of Education (in some instances including courses in the Bouvé College of Health Sciences: counseling psychology, rehabilitation, and special education, or physical education and dance studies programs). Completion of these combined programs enables students to obtain advanced provisional certification, which is recognized in Massachusetts and in other states as well. See page 66 for details or contact the School of Education (54 Lake Hall) at 617.373.3302.

Independent Major

Eligible students who can demonstrate that none of the established major programs in the College of Arts and Sciences provides preparation for their academic or professional goals may petition to design an independent major. The independent major is expected to be interdisciplinary in nature, crossing two or more disciplines. All independent majors must also include a major research effort.

For proposal guidelines, contact the Center for Interdisciplinary Studies (9 Holmes) at 617.373.2427. To begin the process, contact your academic adviser in the Center for Experiential Education and Academic Advising (1 Meserve) at 617.373.3980.

INTERDISCIPLINARY MINORS

Cinema Studies

The cinema studies program at Northeastern University is unique in the Boston area, offering a broad interdisciplinary curriculum. Students who choose the cinema studies minor learn to approach the film and television medium from a range of aesthetic, historical, international, and sociological perspectives. They may also learn to integrate these analytical approaches with practical experience in videography and the study of broadcast technology. The diverse course offerings and carefully structured program have enabled our graduates to do well in the ever-expanding world of video production, distribution, and marketing, as well as to pursue careers as film scholars and teachers. Students take six courses: two required courses, the experiential learning requirement, and three electives. See page 58 for more information on cinema studies or go to the cinema studies Web site at www.cinemastudies.neu.edu.

Minor in Cinema Studies

See "Minor in Cinema Studies" on page 62.

East Asian Studies

East Asian studies is a new program at Northeastern that offers a broad interdisciplinary curriculum. This course of international study not only prepares students to deal with an increasing global environment regardless of their career choice, but also provides insights into our own society.

Minor in East Asian Studies**REQUIRED COURSES**

Complete the following two courses from either regional study:

CHINA

HST U350	Modern China	4 SH
POL U485	Government and Politics in China	4 SH

JAPAN

HST U351	Japan since 1850	4 SH
POL U480	Government and Politics in Japan	4 SH

ELECTIVE COURSES

Choose three courses from the following list. They may include up to three courses from an approved study-abroad program:

ENG U399	Topics in Literature	4 SH
HST U150	East Asian Studies	4 SH
HST U243	American Images of China	4 SH
HST U250	Emergence of East Asia	4 SH
HST U251	Modern East Asia	4 SH
HST U252	Japanese Literature and Culture	4 SH
HST U253	History of Vietnam Wars	4 SH
HST U313	Gender and Revolution in Russia and China	4 SH
HST U450	Engendering China	4 SH
HST U650	Topics in Asian History	4 SH
LNC U101	Elementary Chinese 1	4 SH
LNC U102	Elementary Chinese 2	4 SH
LNC U150	Backgrounds of Chinese Culture	4 SH
LNC U255	Chinese Film: Gender and Ethnicity	4 SH
LNC U301	Intermediate Chinese 1	4 SH
LNJ U101	Elementary Japanese 1	4 SH
LNJ U102	Elementary Japanese 2	4 SH
LNJ U150	Introduction to Japanese Pop Culture	4 SH
LNJ U260	Japanese Film	4 SH
LNJ U301	Intermediate Japanese 1	4 SH
MUS U130	Music of Asia	4 SH
PHL U275	Eastern Religions	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in East Asian Studies—Language Track**REQUIRED COURSES**

Complete the following two courses for either language:

CHINESE

LNC U101	Elementary Chinese 1	4 SH
LNC U102	Elementary Chinese 2	4 SH

JAPANESE

LNJ U101	Elementary Japanese 1	4 SH
LNJ U102	Elementary Japanese 2	4 SH

ELECTIVE COURSES

Choose three courses from the following list. They may include up to three courses from an approved study-abroad program:

ENG U399	Topics in Literature	4 SH
HST U150	East Asian Studies	4 SH

HST U243	American Images of China	4 SH
HST U250	Emergence of East Asia	4 SH
HST U251	Modern East Asia	4 SH
HST U252	Japanese Literature and Culture	4 SH
HST U253	History of Vietnam Wars	4 SH
HST U313	Gender and Revolution in Russia and China	4 SH
HST U350	Modern China	4 SH
HST U351	Japan since 1850	4 SH
HST U450	Engendering China	4 SH
HST U650	Topics in Asian History	4 SH
LNC U150	Backgrounds of Chinese Culture	4 SH
LNC U255	Chinese Film: Gender and Ethnicity	4 SH
LNC U301	Intermediate Chinese 1	4 SH
LNJ U150	Introduction to Japanese Pop Culture	4 SH
LNJ U260	Japanese Film	4 SH
LNJ U301	Intermediate Japanese 1	4 SH
MUS U130	Music of Asia	4 SH
PHL U275	Eastern Religions	4 SH
POL U480	Government and Politics in Japan	4 SH
POL U485	Government and Politics in China	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

For more information, contact the program director, Professor Christina Gilmartin (249 Meserve), at 617.373.4449 or at c.gilmartin@neu.edu.

Environmental Studies

The environmental studies program is designed for students who wish to apply an understanding of both social and scientific issues to the solution of environmental problems. The environmental studies minor is structured to provide a progressive development in skills and knowledge. It is flexible in that it allows latitude in upper-level course choices, selected with the approval of a faculty adviser, to suit individual student interests.

Minor in Environmental Studies

See “Minor in Environmental Studies” on page 71.

Human Services

The human services program prepares students for a career in one of the areas broadly defined as “the helping professions.” Society recognizes the necessity, value, and reward of dedicating time and energy to helping people.

Minor in Human Services

See “Minor in Human Services” on page 78.

Independent Minor

The independent minor gives students the opportunity to construct and obtain recognition for a coherent interdisciplinary content, thematic, or other focus of study supplementary to their major. Minors consist of six courses approved by a faculty

adviser who acts as the minor's sponsor as well as facilitator for the student. The minor should include a directed study course to help the student integrate the subject matter from the disparate disciplines.

GPA REQUIREMENTS

2.000 GPA required in the minor

For proposal guidelines, contact the Center for Interdisciplinary Studies (9 Holmes) at 617.373.2427. To begin the process, contact your academic adviser in the Center for Experiential Education and Academic Advising (1 Meserve) at 617.373.3980.

International Affairs

International affairs brings together various disciplines from the social sciences and humanities, preparing students to live and work in our increasingly global society—the interdependent world in which they will be competing and cooperating.

Minor in International Affairs

See “Minor in International Affairs” on page 79.

Jewish Studies

The Jewish studies program provides students with the opportunity to explore the culture and religion of the Jewish people with a focus on contemporary Jewish life and thought. As a special feature of the program, a cooperative relationship between Northeastern University and Hebrew College allows for tuition-free cross-registration and concurrent library privileges at both institutions, allowing students to complete specialized courses in Judaic subjects at Hebrew College.

Students who choose to minor in Jewish studies take a minimum of five approved courses either at the Northeastern campus, at Hebrew College, through the University's study-abroad program, and/or through the new Jewish Renaissance Project. To minor in Jewish studies, a minimum of three courses must be completed at the Northeastern campus.

Minor in Jewish Studies

REQUIRED COURSES

Complete the following two courses:

PHL U285	Jewish Religion and Culture	4 SH
INT U660	Jewish Studies Module	1 SH
or SOC U924	Directed Study	4 SH

ELECTIVE COURSES

Choose three courses from the following list:

AFR U365	Blacks and Jews	4 SH
ENG U710	Junior/Senior Seminar	4 SH
HST U431 to HST G306		
INT U640	Topics in Jewish Studies	4 SH
MUS U132	Music of the Jewish People	4 SH
PHL U150	Understanding the Bible	4 SH
PHL U335	Nineteenth-Century Philosophy	4 SH
POL U470	Arab-Israeli Conflict	4 SH
SOC U259	Women in Jewish Culture	4 SH

ANCILLARY ELECTIVE

Choose one course from the following list:

ED U521	Language, Culture, and Literacy in Middle and High Schools	3 SH
PHL U110	Introduction to Religion	4 SH
POL U370	Religion and Politics	4 SH
POL U465	Government and Politics in the Middle East	4 SH
SOC U240	Sociology of Prejudice and Violence	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

For more information, contact the program director, Professor Debra Kaufman (515 Holmes), at 617.373.4270 or at d.kaufman@neu.edu.

Latino/a Studies Minor

The LLACS (Latino, Latin American, and Caribbean Studies) program offers an interdisciplinary minor. It explores the historical, cultural, political, and economic foundations of and linkages between U.S. Latino society, Latin America, and the Caribbean. It draws from the heritages of the Americas that are grounded in predominantly indigenous, African, and European cultures.

Minor in Latino, Latin American, and Caribbean Studies

REQUIRED COURSE

Complete the following course:

INT U220	Latino, Latin American, and Caribbean Studies	4 SH
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ELECTIVE COURSES

Choose three courses from the following list:

AFR U345	The Black Experience in the Caribbean	4 SH
AFR U367	Race and Social Identity	4 SH
CIN U240	Latin American Film	4 SH
CIN U265	Spanish Civil War on Film	4 SH
ECN U270	Economic Status of Ethnic Minorities	4 SH
ENG U671	Multiethnic Literature of the U.S.	4 SH
ENG U673	U.S. Latino/Latina Literature	4 SH
HST U260	Modern Latin America	4 SH
HST U261	The Modern Caribbean	4 SH
LNS U160	Latin American Culture	4 SH
LNS U170	Caribbean Literature and Culture	4 SH
LNS U650	Latin American Literature	4 SH
MUS U127	Introduction to World Music	4 SH
MUS U131	Music of Latin America and Caribbean	4 SH
PHL U265	Latin American Religions	4 SH
POL U380	Latino Politics in the United States	4 SH
POL U475	Government and Politics in Latin America	4 SH
SOA U365	Sport, Culture, and Society	4 SH
SOA U500	Latin American Society and Development	4 SH
SOC U246	Environment and Sociology	4 SH
SOC U270	Race and Ethnic Relations	4 SH
SOC U460	Sociology of Latino Society	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Linguistics

What is language? How do children learn to speak? How are signed languages different from spoken languages? How do language barriers keep people apart, and how do language ties bring them together? Do men and women speak differently? How can language serve as a window into the mind? If you are interested in these questions, then linguistics is an essential field of study.

Minor in Linguistics

See “Minor in Linguistics” on page 86.

Marine Studies

The marine studies minor is designed to provide a structured program for students with an interest in the marine environment. The program allows a primary, but not exclusive, emphasis in either the scientific or the social science/humanistic study of the oceans.

The program draws on courses throughout the University and is affiliated with several outstanding, specialized marine programs. These include the Sea Semester Program run by the Sea Education Association, which provides a rigorous program in marine sciences at Woods Hole, Massachusetts, and aboard one of its tall ships for training cruises in the Caribbean, Pacific, or Labrador Sea.

Students may also take courses through the Marine Studies Consortium, comprising sixteen area colleges and universities. These courses are taught by local experts and practitioners in marine fields.

Minor in Marine Studies

REQUIRED COURSES

Complete four courses from the following lists, with at least one course from humanities and one course from the sciences. In addition, two courses must be above the introductory level:

HUMANITIES

HST U210	Atlantic Connection	4 SH
HST U232	History of Boston	4 SH
INT U305	Maritime History of New England	4 SH
INT U310	Water Resources Policy and Management	4 SH

SCIENCES

BIO U151	Introduction to Marine Biology	4 SH
BIO U315	Invertebrate Zoology	4 SH
BIO U501	Marine Botany	4 SH
BIO U503	Marine Invertebrate Zoology	4 SH
BIO U505	Biology of Corals and Coral Reefs	3 SH
BIO U507	Biology and Ecology of Fishes	3 SH
BIO U509	Marine Birds and Mammals	2 SH
BIO U511	Adaptations of Aquatic Organisms	3 SH
BIO U515	Benthic Marine Ecology	3 SH
BIO U517	Oceanography	2 SH
BIO U519	Ocean and Coastal Processes	3 SH
BIO U521	Experimental Design Marine Ecology	4 SH
BIO U523	Molecular Marine Biology	3 SH
BIO U525	Marine Microbial Ecology	2 SH
BIO U589	Diving Research Methods	2 SH

GEO U102	Marine Resources	4 SH
GEO U104	Physical Oceanography	4 SH
GEO U106	Biological Oceanography	4 SH
GEO U108	New England Fisheries Resources	4 SH
GEO U110	Geology of Oceans and Coasts	4 SH
GEO U510	Environmental Planning	4 SH
GEO U542	Fossils and Paleoecology	5 SH
GEO U544	Sedimentation	5 SH
GEO U546	Coastal Processes	5 SH
GEO U548	Marine Geology	4 SH
INT U200	Marine Studies	4 SH
INT U210	Marine Mammals	4 SH
INT U300	The Ocean World	4 SH
INT U315	Wetlands: Ecology and Hydrology	4 SH
INT U325	Coastal Zone Management	4 SH
INT U500	Advanced Seminar in Marine Studies	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

For more information, contact the director of marine studies, Professor Peter Rosen (14 Holmes), at 617.373.4380 or at p.rosen@neu.edu.

Middle East Studies

The new interdisciplinary minor in Middle East studies available through the College of Arts and Sciences prepares students to study and understand the complexities of this region of the globe.

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Middle East Studies

REQUIRED COURSES

Complete the following two courses:

HST U290	Modern Middle East	4 SH
POL U465	Government and Politics in the Middle East	4 SH

ELECTIVE COURSES

Choose three courses from the following list. They may include up to three courses from an approved study-abroad program:

HST U393	Islam and Empires	4 SH
HST U394	Islamic Nationalism	4 SH
LNA U101	Elementary Arabic 1	4 SH
LNA U102	Elementary Arabic 2	4 SH
PHL U280	Islam	4 SH
POL U470	Arab-Israeli Conflict	4 SH
POL U915	Model Arab League	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Middle East Studies—Language Track

REQUIRED COURSES

Complete the following two courses:

LNA U101	Elementary Arabic 1	4 SH
LNA U102	Elementary Arabic 2	4 SH

ELECTIVE COURSES

Choose three courses from the following list. They may include up to three courses from an approved study-abroad program:

HST U290	Modern Middle East	4 SH
HST U393	Islam and Empires	4 SH
HST U394	Islamic Nationalism	4 SH
PHL U280	Islam	4 SH
POL U465	Government and Politics in the Middle East	4 SH
POL U470	Arab-Israeli Conflict	4 SH
POL U915	Model Arab League	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Students may also fulfill the minor by completing approved courses through Northeastern's Partnership with Hebrew College or by taking up to three courses from an approved Northeastern study-abroad program.

For more information, contact Professor Irm Haleem (303 Meserve) at 617.373.4400 or at i.haleem@neu.edu.

Urban Studies

The urban studies minor offers undergraduates interested in urban issues an opportunity to develop a tailor-made curriculum for their minor. Following Northeastern's tradition of practice-oriented education, the program offers opportunities to engage in urban research and to complete cooperative education placements in organizations that address urban issues (that is, community-based organizations, city government agencies, or metropolitan planning agencies).

Minor in Urban Studies

REQUIRED COURSES

Complete the following two courses:

POL U357	Growth and Decline of Cities and Suburbs	4 SH
or SOC U357	Growth and Decline of Cities and Suburbs	4 SH
POL U358	Current Issues in Cities and Suburbs	4 SH
or SOC U358	Current Issues in Cities and Suburbs	4 SH

ELECTIVE COURSES

Choose two courses from the following list:

AFR U140	African-American History	4 SH
AFR U270	Economic Status of Ethnic Minorities	4 SH
AFR U312	Black History of Boston	4 SH
AFR U337	African-American History before 1900	4 SH
AFR U360	Politics of Poverty	4 SH
AFR U399	Black Community and Social Change	4 SH
AFR U485	Educational Issues/Black Community	4 SH
ARC U111	History of World Architecture 1	4 SH
ARC U112	History of World Architecture 2	4 SH
ARC U223	American Architecture	4 SH
ARC U325	Nineteenth-Century Architecture and Urbanism	4 SH

ARC U326	Twentieth-Century Architecture and Urbanism	4 SH
ECN U101	Economic Problems and Perspectives	4 SH
ECN U270	Economic Status of Ethnic Minorities	4 SH
ECN U420	Urban Economic Issues	4 SH
ECN U461	Government and Business	4 SH
ECN U470	American Economic History	4 SH
HST U140	Introduction to African-American History	4 SH
HST U230	Contemporary America	4 SH
HST U232	History of Boston	4 SH
HST U338	African-American History since 1900	4 SH
HST U344	U.S. Urban History	4 SH
POL U165	Public Policy and Administration	4 SH
POL U345	Urban Policies and Politics	4 SH
SOA U305	Global Markets and Local Culture	4 SH
SOC U220	Sociology of Boston	4 SH
SOC U247	Urban Social Problems	4 SH
SOC U403	American Society	4 SH
SOC U418	Greater Boston Urban Policy Seminar	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

BROWN BAG SERIES

Participation in a brown bag series. Talks are held once a semester to discuss timely urban topics.

For more information, contact the program director, Professor Joan Fitzgerald (337 Meserve), at 617.373.3644 or at jo.fitzgerald@neu.edu.

Women's Studies

The women's studies program offers students an opportunity to work with respected scholars in a variety of disciplines to examine the human experience through the perspectives of women. This interdisciplinary program examines the importance of gender in societies around the world, past and present. The curriculum encourages students to learn and think about how changing beliefs about women and men have affected research and scholarship in the arts, humanities, and social and natural sciences. Students learn about gender stereotypes, the various ways ideas about gender and sexuality have developed, and the changing situation for women and men today. Key questions are posed that change how people see the world: How does gender influence the kinds of questions we can ask of the world around us? What information can become data when you use gender as a central part of examining a problem? The women's studies program coordinates the Boston Area Colloquium on Feminist Theory lecture series, sponsors talks by scholars on campus, produces the *Working Papers in Gender Studies Series*, and sponsors the Visiting Research Scholars in Women's Studies series. Women's studies also works closely with the independent, student-run Women's Center to sponsor programs for Women's History Month and other events of special concern to women students.

Minor in Women's Studies

REQUIRED COURSE

Complete the following course:

INT U103 Women's Studies 4 SH

ELECTIVE COURSES

Choose three courses from the following list:

AFR U109	Foundations of Black Culture 1	4 SH
AFR U185	Gender in the African Diaspora	4 SH
AFR U220	African-American Theatre	4 SH
AFR U261	The Modern Caribbean	4 SH
AFR U320	The Black Family	4 SH
AFR U350	History of Blacks in the Media and the Press	4 SH
AFR U367	Race and Social Identity	4 SH
AFR U500	Arts of the African Diaspora	4 SH
AFR U663	Early African-American Literature	4 SH
BIO U149	Biology of Human Reproduction	4 SH
CAP U505	Human Sexuality	4 SH
CIN U350	Film Theory	4 SH
CIN U390	Film and Psychoanalysis	4 SH
CJ U500	Gender, Crime, and Justice	4 SH
CMN U304	Communication and Gender	4 SH
ENG U226	Backgrounds in English and American Literature	4 SH
ENG U350	Linguistic Analysis	4 SH
ENG U399	Topics in Literature	4 SH
ENG U588	Literature in Context	4 SH
ENG U600	Major Figure	4 SH
ENG U663	Early African-American Literature	4 SH
ENG U670	Modern African-American Literature	4 SH
ENG U671	Multiethnic Literature of the U.S.	4 SH
ENG U691	Gender Roles in Literature	4 SH
HST U203	Modern Family	4 SH
HST U204	Third World Women	4 SH
HST U242	Women in America	4 SH
HST U350	Modern China	4 SH
HST U372	Gender and Society in Modern Europe	4 SH
HST U431	American Jewish History	4 SH
LIN U350	Linguistic Analysis	4 SH
LIN U412	Language and Culture	4 SH
LNC U255	Chinese Film: Gender and Ethnicity	4 SH
LNS U150	Spanish Culture	4 SH
LNS U240	Latin American Film	4 SH
LNS U265	Spanish Civil War on Film	4 SH
MUS U106	Women in Music	4 SH
MUS U924	Directed Study	4 SH
NUR U302	Nursing with Women and Families	5 SH
PHL U295	Religious Perspectives on Health and Healing	4 SH
PHL U390	Cults and Sects	4 SH
POL U375	Gender and Politics	4 SH
POL U475	Government and Politics in Latin America	4 SH
PSY U200	Psychology of Women	4 SH
PSY U206	Food, Behavior, and Eating Disorders	4 SH
PSY U354	Psychology and Film	4 SH

PSY U404	Developmental Psychology	4 SH
SOA U302	Sex, Sex Roles, and Family	4 SH
SOA U305	Global Markets and Local Culture	4 SH
SOA U307	Social Movements in the Third World	4 SH
SOA U412	Language and Culture	4 SH
SOA U500	Latin American Society and Development	4 SH
SOC U255	Sociology of the Family	4 SH
SOC U256	Violence in the Family	4 SH
SOC U259	Women in Jewish Culture	4 SH
SOC U260	Gender in a Changing Society	4 SH
SOC U268	The Social Movements of the 1960s	4 SH
SOC U272	Social Roles in the Business World	4 SH
SOC U273	Women Working	4 SH
SOC U280	Sociology of Work	4 SH

UPPER-DIVISION ELECTIVE

Choose one upper-division course in consultation with the director of the women's studies program.

GPA REQUIREMENTS

2.000 GPA required in the minor

For more information, contact the program director, Professor Susan Setta (386 Holmes), at 617.373.7699 or at s.setta@neu.edu or women's studies staff at 617.373.4984 or at l.wang@neu.edu.

INTERDISCIPLINARY FACILITIES

An interdisciplinary media training facility, featuring two television studios, state-of-the-art Avid and Media 100 digital video-editing suites, and digital audio recording and editing facilities, exists on the second floor of Shillman Hall. Qualified students may enroll in courses utilizing this facility through any of its six participating departments (visual arts, cinema studies, communication studies, history, journalism, music, or theatre) or through interdisciplinary studies. Note that these courses fill quickly; some require prerequisites; and many give preference to students whose majors require them. For field production, the studio offers an array of digital cameras and peripheral equipment including lights and microphones. For students who complete elementary and intermediate training in the studio, an interdisciplinary capstone production course is offered; resulting videos may be broadcast on a public access cable channel in Boston. For details about eligibility and availability, contact one of the participating departments or the studio manager, Ron Starr, at 617.373.2314.

The multimedia studies dual major (see course descriptions on pages 338–339) offers its students access to a number of modern facilities. Among these are a dedicated computer music lab, an advanced music and sound synthesis facility, a graphics and media development room, and a state-of-the-art, multimedia development center constructed in 1999. The multimedia development center is used by students for courses in graphics and animation, and is also the site of the program's capstone courses, in which students from all the core multime-

dia disciplines work together on team projects. In addition, the center is used by the guest speakers and lecturers who regularly appear on campus in support of the multimedia curriculum.

Hardware and software in the multimedia center permit the production of multimedia creations that integrate live action and/or animated moving images, graphics, photographs, sound effects, and music. The center can operate independently or via networked interchange with digital arts, digital music, and media production laboratories and studios on campus or, through NUNET links to the Internet, with resources available elsewhere.

For more information on the multimedia dual major and its facilities, contact the program director, Professor Anthony De Ritis, at 617.373.3914 or at a.deritis@neu.edu.

SPECIAL PROGRAMS

Additional information is available from involved departments and the Center for Experiential Education and Academic Advising, 1 Meserve Hall.

The availability of all special programs is contingent on meeting minimum enrollment numbers and, when an outside institution is involved, continued affiliation of that institution with the University. Overseas study programs are open to qualified middlers, juniors, and seniors with a cumulative grade-point average of 3.000 or higher.

Combined Program with Professional Schools

In the combined program, a preprofessional student may reduce by one year the time normally required for obtaining both the undergraduate and professional degrees. Students who have completed at least three-fourths of the work required for a baccalaureate degree in the College of Arts and Sciences and who are accepted into an approved professional school of dentistry, law, medicine, optometry, osteopathy, or veterinary medicine will be eligible for the Bachelor of Arts or Bachelor of Science degree at the end of their second year in a professional school. At least two-thirds of the work for the baccalaureate degree must be earned in residence at Northeastern, and all other College of Arts and Sciences requirements must be fulfilled. The residence requirement must be completed prior to entering the professional school.

Bachelor of Arts or Bachelor of Science/Juris Doctor Degree Program

Northeastern offers an eight-year joint degree program for aspiring lawyers. Each year a limited number of highly qualified freshmen are admitted to the five-year undergraduate portion of the program.

To continue into the law school portion of the program, students must graduate in the top 15 percent of their class and score in the top 20 percent of the Law School Aptitude Test (LSAT). Students who meet these criteria will be qualified to continue their studies at Northeastern University School of Law.

Northeastern University–Hebrew College Exchange

This program offers students the opportunity to register for courses in specialized areas of Jewish Studies and Jewish education. See page 34, “Minor in Jewish Studies,” or for more information on the program, call the Center for Interdisciplinary Studies (9 Holmes) at 617.373.2427.

Marine Science

East/West Marine Biology Program. The east/west marine biology program allows advanced undergraduate and beginning graduate students in biology and related areas to spend a year of field study in three diverse marine environments.

The program begins in the fall at Northeastern University's Marine Science Center in Nahant, twelve miles from the main campus. In January, students travel to Jamaica to study tropical biology at the Discovery Bay Marine Laboratory on the island's north coast. The final segment of the program is conducted at the University of Southern California's Wrigley Marine Science Center on Santa Catalina Island, located twenty miles off the coast of Los Angeles. For more information, contact Sal Genovese at 781.581.7370, extension 311.

Marine Science Center Summer Program in Marine Biology. The summer program allows students to participate in intensive courses at the Marine Science Center (MSC). Students conduct independent research at the MSC laboratory throughout the year. Graduate students from other universities are encouraged to use the laboratory and field sites for thesis research.

Massachusetts Bay Marine Studies Consortium. Northeastern University is a member of the Massachusetts Bay Marine Studies Consortium. The consortium's course offerings are interdisciplinary and seek to bridge academic disciplines and current concerns in the marine world. The consortium serves the students and faculty of twenty-two Boston-area colleges and universities. Students from Northeastern may take these classes, which are taught by specialists and government officials. For more information, contact the marine studies coordinator at 617.373.4380.

Sea Education Association. Sea Semester is an interdisciplinary program focusing on the sea in which students undertake course work ashore followed by a practical component at sea. The program combines intensive research in the areas of oceanography, maritime studies, and nautical science with hands-on experience aboard a traditional sailing ship. Piloting, celestial navigation, and practical seamanship are learned together with oceanographic sampling techniques and marine laboratory procedures during a six-week voyage on a ship sailing

on either the Atlantic or Pacific Ocean. Critical thinking, problem-solving, team-building, and leadership skills are emphasized throughout the program. Sea Semester is appropriate for students in marine biology, geology and physical science, environmental studies, American studies, and most other areas within the liberal arts and sciences. For more information, contact the marine studies coordinator, Professor Peter S. Rosen, at 617.373.4380.

The Center for the Arts

The primary mission of the Center for the Arts is to support and develop the arts as a vital and integral component of the Northeastern community. Through a variety of main stage and artist-in-residency programs, featuring performing and visual artists acclaimed for their excellence, the center complements the academic arts departments in their effort to educate Northeastern students in becoming knowledgeable, discriminating, and active participants in the arts. In addition, the center supports curriculum-oriented arts projects and events, encourages interdepartmental collaborations, develops exhibitions and presentations that serve the on-campus community as well as the general public, provides multicultural arts programs, and acts as a primary facilitator for research in the arts.

The center also manages the Blackman Auditorium Theatre Complex and operates the Northeastern University Ticket Center. Tickets to and information about performing and visual arts events and other campus events are available in the ticket center as are tickets and passes to Boston-area dance, music, theatre, film, and visual arts events. The ticket center also provides free passes and maintains a University membership to the Museum of Fine Arts that entitles all undergraduate students in the full-time day programs to free membership privileges.

For information on arts activities, please call the Center for the Arts office at 617.373.2249. For ticket information, call the ticket center at 617.373.2247.

STUDY ABROAD

The College of Arts and Sciences strongly endorses international experience as an important dimension of learning. To foster this, it maintains an Office of International Study Programs that has developed a series of programs tailored to the interests and needs of Northeastern University students.

College of Arts and Sciences International Study Programs

While studying abroad in a Northeastern-sponsored program, students maintain full-time Northeastern status and earn Northeastern credits. Upon successful completion of the program, grades are calculated into students' grade-point average (GPA) and students will have fulfilled the college's experiential education requirement. For the international affairs major, study abroad fulfills the international experience requirement. Students may also fulfill additional requirements, depending

upon their individual academic plan and approval by their adviser. The minimum requirements for participation in College of Arts and Sciences study-abroad programs are mid-level-year standing and 3.000 GPA. The application deadlines are February 10 for fall enrollments and September 25 for spring enrollments.

Students who wish to study abroad on a College of Arts and Sciences study-abroad program should start by researching program opportunities online at www.casdn.neu.edu/sap, then attend an information session, offered regularly in 1 Meserve. Finally, meet with a study-abroad adviser. Schedules for information sessions and advisers are posted online and in 1 Meserve.

The College of Arts and Sciences offers three types of study-abroad programs. Please see below for a complete list of current study-abroad locations.

Traditional. Students are based at a host institution where they attend classes, participate in student activities, and organize their extracurricular schedules just as they do on campus at Northeastern. Some examples include Monash University in Melbourne, Australia; University of Edinburgh in Scotland; and Obirin University in Tokyo, Japan.

Internship. These programs offer a combination of classes and related work experience for which students earn academic credit. For example, students typically intern with a member of the Australian Parliament in Canberra, the European Parliament in Brussels, the British Parliament in England, or the Irish Parliament in Dublin.

Experiential Research. The focus of the students' time abroad is on an independent research project. The study-abroad program organizes small group seminars and field trips that are designed to help students learn about their international environment and focus on a research topic. Students spend three to four weeks toward the end of the semester working on their individual projects. Students may study tropical biology in Costa Rica, history and culture in Vietnam, and oceanography while sailing in the Caribbean or Canadian Maritimes.

Following is a list of locations where students can study abroad in College of Arts and Sciences programs:

Argentina, Buenos Aires	Universidad del Salvador
Australia, Canberra	Australia National University
Australia, Gold Coast	Bond University
Australia, Melbourne	Monash University
Australia, Perth	Curtin University
Australia, Sydney	University of Sydney
Belgium, Leuven and Brussels	Irish Institute for European Affairs
Canada, Vancouver	Simon Fraser University
Caribbean/Canadian Maritimes	Woods Hole Sea Semester
Chile, Santiago	Pontificia Universidad Católica de Chile

China, Beijing	Beijing Foreign Studies University
China, Hong Kong	Chinese University of Hong Kong
Costa Rica, Monteverde	Monteverde Biological Research Station
Costa Rica, San Jose	International Center for Sustainable Human Development
Czech Republic, Prague	Charles University
Dominican Republic, Santiago	Pontificia Universidad Católica Madra y Maestra
Dominican Republic, Santo Domingo	Facultad Latinoamericana de Ciencias Sociales
Egypt, Cairo	American University of Cairo
France, Paris	American University of Paris
Ghana, Legon	University of Ghana
Greece, Thessaloniki	American College of Thessaloniki
Ireland, Dublin	Institute of Public Administration
Israel, Tel Aviv	University of Tel Aviv
Italy, Florence	Studio Art Centers International
Italy, Perugia	Umbra Institute
Japan, Tokyo	Obirin University
Mexico, Puebla	Universidad de las Americas—Puebla
New Zealand, Auckland	University of Auckland
New Zealand, Christchurch	University of Canterbury
South Africa, Cape Town	University of Cape Town
Spain, Alicante	University of Alicante
Spain, Seville	University of Seville
UK: England, Cambridge	University of Cambridge
UK: England, London	Goldsmith's College
UK: England, London	Hansard Society at London School of Economics
UK: Northern Ireland, Belfast	Queens University
UK: Scotland, Edinburgh	University of Edinburgh
Vietnam, Ho Chi Minh City	School for International Training

Independent Study Abroad. Students who choose to study abroad on a non-Northeastern program must apply individually to their school of choice, take an official leave of absence from Northeastern, and petition to have their credits transferred. It is strongly recommended that students first meet with their dean's office academic adviser for approval of their study-abroad program. It is the dean's office adviser's responsibility to evaluate and award transfer credit. Students may get leave-of-absence forms from the receptionist at the Center for Experiential Education and Academic Advising, 1 Meserve.

COLLEGE OF ARTS AND SCIENCES CORE REQUIREMENTS

The College of Arts and Sciences departmental listings, which begin on page 46, give the detailed requirements for each degree offered by the college. Each of these detailed requirement listings in turn references one of the core requirements shown below. Each student seeking a bachelor's degree in the College of Arts and Sciences must complete the core requirements for the degree sought.

BA Core Requirements

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH
and one approved Advanced Writing in the Disciplines course.
A grade of C is required in both courses.

MATHEMATICS

Complete one course from the list "Approved Courses: Mathematics" (see below) with a grade of C or better or a higher-level calculus course with a grade of C- or better.

FOREIGN LANGUAGE

Complete two courses in the same language with a grade of C or better. Proficiency at elementary level two or higher is required. See the list "Approved Courses: Foreign Language" below.

METHODS OF INQUIRY

Courses from the major cannot count toward the methods of inquiry section of the core.

Arts Context

Complete one course from the list "Approved Courses: Methods of Inquiry—Arts Context" (see below).

Humanities Context

Complete one course from the list "Approved Courses: Methods of Inquiry—Humanities Context" (see below).

Natural World Context

Complete one course from the list "Approved Courses: Methods of Inquiry—Natural World Context" (see below).

Social World Context

Complete one course from the list "Approved Courses: Methods of Inquiry—Social World Context" (see below).

DIVERSITY

Complete two courses from the list "Approved Courses: Diversity" (see below), or complete program of study abroad.

HISTORICAL, ETHICAL, AND AESTHETIC PERSPECTIVES

Complete two courses from the list "Approved Courses: Historical, Ethical, and Aesthetic Perspectives" (see below).

ANALYSIS

Complete one course from the list "Approved Courses: Analysis" (see below).

BA Core Requirements for Specified Programs**ENGLISH REQUIREMENT**

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C or better is required in both courses.

MATHEMATICS

Complete one course from the list “Approved Courses: Mathematics” (see below) with a grade of C or better or a higher-level calculus course with a grade of C– or better.

FOREIGN LANGUAGE

Complete two courses in the same language with a grade of C or better. Proficiency at elementary level two or higher is required. See the list “Approved Courses: Foreign Language” below.

METHODS OF INQUIRY

Courses from the major cannot count toward the methods of inquiry section of the core.

Arts/Humanities Context

Complete one course from the list “Approved Courses: Methods of Inquiry—Arts Context” or one course from the list “Approved Courses: Methods of Inquiry—Humanities Context” (see below).

Natural World Context

Complete one course from the list “Approved Courses: Methods of Inquiry—Natural World Context” (see below).

Social World Context

Complete one course from the list “Approved Courses: Methods of Inquiry—Social World Context” (see below).

DIVERSITY

Complete one course from the list “Approved Courses: Diversity” (see below), or complete program of study abroad.

HISTORICAL, ETHICAL, AND AESTHETIC PERSPECTIVES

Complete one course from the list “Approved Courses: Historical, Ethical, and Aesthetic Perspectives” (see below).

ANALYSIS

Complete one course from the list “Approved Courses: Analysis” (see below).

BS Core Requirements for Arts/Humanities Majors**ENGLISH REQUIREMENT**

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C or better is required in both courses.

MATHEMATICS

Complete one course from the list “Approved Courses: Mathematics” (see below) with a grade of C or better or a higher-level calculus course with a grade of C– or better.

METHODS OF INQUIRY

Courses from the major cannot count toward the methods of inquiry section of the core.

Arts/Humanities Context

The Arts/Humanities Context requirement is satisfied within the major.

Natural World Context

Complete one course from the list “Approved Courses: Methods of Inquiry—Natural World Context” (see below).

Social World Context

Complete one course from the list “Approved Courses: Methods of Inquiry—Social World Context” (see below).

DIVERSITY

Complete one course from the list “Approved Courses: Diversity” (see below), or complete program of study abroad.

HISTORICAL, ETHICAL, AND AESTHETIC PERSPECTIVES

Complete one course from the list “Approved Courses: Historical, Ethical, and Aesthetic Perspectives” (see below).

ANALYSIS

Complete one course from the list “Approved Courses: Analysis” (see below).

BS Core Requirements for Natural Science Majors**ENGLISH REQUIREMENT**

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C or better is required in both courses.

MATHEMATICS

The mathematics requirement is satisfied within the major.

METHODS OF INQUIRY

Courses from the major cannot count toward the methods of inquiry section of the core.

Arts/Humanities Context

Complete one course from the list “Approved Courses: Methods of Inquiry—Arts Context” or one course from the list “Approved Courses: Methods of Inquiry—Humanities Context” (see below).

Natural World Context

The natural world context requirement is satisfied within the major.

Social World Context

Complete one course from the list “Approved Courses: Methods of Inquiry—Social World Context” (see below).

DIVERSITY

Complete one course from the list “Approved Courses: Diversity” (see below), or complete program of study abroad.

HISTORICAL, ETHICAL, AND AESTHETIC PERSPECTIVES

Complete one course from the list “Approved Courses: Historical, Ethical, and Aesthetic Perspectives” (see below).

ANALYSIS

Complete one course from the list “Approved Courses: Analysis” (see below).

BS Core Requirements for Social Science Majors

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C or better is required in both courses.

MATHEMATICS

Complete one course from the list “Approved Courses: Mathematics” (see below) with a grade of C or better or a higher-level calculus course with a grade of C– or better.

METHODS OF INQUIRY

Courses from the major cannot count toward the methods of inquiry section of the core.

Arts/Humanities Context

Complete one course from the list “Approved Courses: Methods of Inquiry—Arts Context” or one course from the list “Approved Courses: Methods of Inquiry—Humanities Context” (see below).

Natural World Context

Complete one course from the list “Approved Courses: Methods of Inquiry—Natural World Context” (see below).

Social World Context

The social world context requirement is satisfied within the major.

DIVERSITY

Complete one course from the list “Approved Courses: Diversity” (see below), or complete program of study abroad.

HISTORICAL, ETHICAL, AND AESTHETIC PERSPECTIVES

Complete one course from the list “Approved Courses: Historical, Ethical, and Aesthetic Perspectives” (see below).

ANALYSIS

Complete one course from the list “Approved Courses: Analysis” (see below).

Approved Courses: Mathematics

MTH U115	Applications of Algebra	4 SH
MTH U117	Interactive Mathematics	4 SH
MTH U131	Calculus for Business and Economics	4 SH
MTH U141	Calculus 1	4 SH

Approved Courses: Foreign Language

ARABIC

LNA U101	Elementary Arabic 1	4 SH
LNA U102	Elementary Arabic 2	4 SH
LNA U301	Arabic Conversation and Composition	4 SH

AMERICAN SIGN LANGUAGE

ASL U101	Elementary ASL 1	4 SH
ASL U102	Elementary ASL 2	4 SH
ASL U301	Intermediate ASL 1	4 SH
ASL U302	Intermediate ASL 2	4 SH
ASL U501	Advanced ASL 1	2 SH
ASL U502	Advanced ASL 2	2 SH

CHINESE

LNC U101	Elementary Chinese 1	4 SH
LNC U102	Elementary Chinese 2	4 SH
LNC U301	Chinese Conversation and Composition 1	4 SH
LNC U302	Chinese Conversation and Composition 2	4 SH
LNC U501	Advanced Chinese 1	4 SH
LNC U502	Advanced Chinese 2	4 SH

FRENCH

LNF U101	Elementary French 1	4 SH
LNF U102	Elementary French 2	4 SH
LNF U111	Elementary French 1—BSIB	4 SH
LNF U112	Elementary French 2—BSIB	4 SH
LNF U301	French Conversation and Composition 1	4 SH
LNF U302	French Conversation and Composition 2	4 SH
LNF U311	Intermediate French 1—BSIB	4 SH
LNF U312	Intermediate French 2—BSIB	4 SH
LNF U438	Structure of French	4 SH
LNF U501	Advanced French	4 SH
LNF U511	Advanced French 1—BSIB	4 SH
LNF U512	Advanced French 2—BSIB	4 SH

GERMAN

LNG U101	Elementary German 1	4 SH
LNG U102	Elementary German 2	4 SH
LNG U111	Elementary German 1—BSIB	4 SH
LNG U112	Elementary German 2—BSIB	4 SH
LNG U301	German Conversation and Composition	4 SH
LNG U311	Intermediate German 1—BSIB	4 SH
LNG U312	Intermediate German 2—BSIB	4 SH
LNG U511	Advanced German 1—BSIB	4 SH
LNG U512	Advanced German 2—BSIB	4 SH

ITALIAN

LNI U101	Elementary Italian 1	4 SH
LNI U102	Elementary Italian 2	4 SH
LNI U301	Italian Conversation and Composition 1	4 SH
LNI U302	Italian Conversation and Composition 2	4 SH
LNI U501	Advanced Italian 1	4 SH
LNI U502	Advanced Italian 2	4 SH

JAPANESE

LNJ U101	Elementary Japanese 1	4 SH
LNJ U102	Elementary Japanese 2	4 SH
LNJ U301	Japanese Conversation and Composition	4 SH

RUSSIAN		
LNR U101	Elementary Russian 1	4 SH
LNR U102	Elementary Russian 2	4 SH
LNR U301	Russian Conversation and Composition	4 SH
SPANISH		
LNS U101	Elementary Spanish 1	4 SH
LNS U102	Elementary Spanish 2	4 SH
LNS U111	Elementary Spanish 1—BSIB	4 SH
LNS U112	Elementary Spanish 2—BSIB	4 SH
LNS U301	Spanish Conversation and Composition 1	4 SH
LNS U302	Spanish Conversation and Composition 2	4 SH
LNS U311	Intermediate Spanish 1—BSIB	4 SH
LNS U312	Intermediate Spanish 2—BSIB	4 SH
LNS U436	Structure of Spanish	4 SH
LNS U511	Advanced Spanish 1—BSIB	4 SH
LNS U512	Advanced Spanish 2—BSIB	4 SH

Approved Courses: Methods of Inquiry—Arts Context

AFR U112	Jazz	4 SH
AFR U500	Arts of the African Diaspora	4 SH
ART U106	Introduction to Art	4 SH
ART U500	Arts of the African Diaspora	4 SH
MUS U101	Introduction to Music	4 SH
MUS U102	Music as a Listening Experience	4 SH
MUS U107	Introduction to Opera	4 SH
MUS U109	Introduction to Art, Drama, and Music	4 SH
MUS U112	Jazz	4 SH
MUS U201	Music Theory 1	4 SH
THE U101	Theatre Arts	4 SH
THE U120	Acting 1	4 SH
THE U130	Introduction to Acting	4 SH

Approved Courses: Methods of Inquiry—Humanities Context

CIN U120	Exploring the Humanities through Film	4 SH
ENG U150	Introduction to Language and Linguistics	4 SH
ENG U165	Poetry	4 SH
ENG U166	Fiction	4 SH
ENG U167	Drama	4 SH
INT U120	Exploring Humanities through Film	4 SH
LIN U115	Introduction to Logic	4 SH
LIN U150	Introduction to Language and Linguistics	4 SH
LIN U215	Symbolic Logic	4 SH
LNF U280	French Film and Culture	4 SH
PHL U101	Introduction to Philosophy	4 SH
PHL U110	Introduction to Religion	4 SH
PHL U114	Critical Reasoning	4 SH
PHL U115	Introduction to Logic	4 SH
PHL U150	Understanding the Bible	4 SH
PHL U215	Symbolic Logic	4 SH
PHL U220	The Meaning of Death	4 SH
THE U300	Theatre History	4 SH

Approved Courses: Methods of Inquiry—Natural World Context

BIO U145	Environment and Humankind	4 SH
BIO U147	The Human Organism	4 SH
BIO U149	Biology of Human Reproduction	4 SH
BIO U151	Introduction to Marine Biology	4 SH
CHM U101	General Chemistry for Health Sciences	5 SH
CHM U104	Organic Chemistry for Health Sciences	5 SH
CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH
GEO U102	Marine Resources	4 SH
GEO U104	Physical Oceanography	4 SH
GEO U106	Biological Oceanography	4 SH
GEO U108	New England Fisheries Resources	4 SH
GEO U110	Geology of Oceans and Coasts	4 SH
GEO U112	Environmental Geology	4 SH
GEO U114	Natural Disasters and Catastrophes	4 SH
GEO U116	Global Climate Change	4 SH
GEO U118	Planetary Astronomy	4 SH
GEO U200	Dynamic Earth	4 SH
GEO U205	Physical Geography	4 SH
INT U250	ELMO Music Module 1	2 SH
INT U251	ELMO Music Module 2	2 SH
INT U260	ELMO Art Module 1	2 SH
INT U261	ELMO Art Module 2	2 SH
INT U270	ELMO Theatre Module 1	2 SH
INT U271	ELMO Theatre Module 2	2 SH
MTH U160	Linear Programming	4 SH
MTH U180	Statistical Thinking	4 SH
PHY U111	Astronomy	4 SH
PHY U121	Introduction to Science	4 SH
PHY U132	Energy, Environment, and Society	4 SH
PHY U145	Physics for Life Sciences 1	5 SH
with PHY U146	Lab for PHY U145	0 SH
PHY U147	Physics for Life Sciences 2	5 SH
with PHY U148	Lab for PHY U147	0 SH

Approved Courses: Methods of Inquiry—Social World Context

AFR U101	African-American Studies	4 SH
AFR U307	Africa Today	4 SH
ECN U101	Economic Problems and Perspectives	4 SH
ECN U115	Principles of Macroeconomics	4 SH
ECN U116	Principles of Microeconomics	4 SH
ED U111	Education in the Community	4 SH
HST U103	Women's Studies	4 SH
HST U110	Introduction to World History	4 SH
HST U120	Introduction to Public History	4 SH
HST U130	Introduction to American History	4 SH
HST U150	East Asian Studies	4 SH
HST U170	Introduction to European History	4 SH
HST U421	History through Film	4 SH
IAF U101	Introduction to International Affairs	4 SH
INT U103	Women's Studies	4 SH
INT U150	East Asian Studies	4 SH

JRN U150	Interpreting the Day's News	4 SH	HST U140	Introduction to African-American History	4 SH
PHL U103	Women's Studies	4 SH	HST U180	African History	4 SH
POL U150	American Government	4 SH	HST U204	Third World Women	4 SH
POL U155	Comparative Politics	4 SH	HST U212	History of Race	4 SH
POL U160	International Relations	4 SH	HST U242	Women in America	4 SH
PSY U101	Foundations of Psychology	4 SH	HST U290	Modern Middle East	4 SH
SOA U101	Peoples and Cultures	4 SH	HST U337	African-American History before 1900	4 SH
SOA U302	Sex, Sex Roles, and Family	4 SH	HST U338	African-American History since 1900	4 SH
SOA U307	Social Movements in the Third World	4 SH	HST U391	Modern African Civilization	4 SH
SOA U310	Individual Culture	4 SH	HST U392	African Diaspora	4 SH
SOC U103	Women's Studies	4 SH	HST U432	Latin America in Boston	4 SH
SOC U205	Law and Social Justice	4 SH	INT U285	Jewish Religion and Culture	4 SH
SOC U210	Class, Power, and Social Change	4 SH	LNC U150	Backgrounds of Chinese Culture	4 SH
SOC U221	Doing Sociology	4 SH	LNC U255	Chinese Film: Gender and Ethnicity	4 SH
SOC U228	Social Problems	4 SH	LNJ U150	Introduction to Japanese Pop Culture	4 SH
SOC U235	Social Psychology	4 SH	MTH U201	History of Mathematics	4 SH
SOC U246	Environment and Sociology	4 SH	MUS U106	Women in Music	4 SH
SOC U247	Urban Social Problems	4 SH	MUS U128	Music of Africa	4 SH
SOC U255	Sociology of the Family	4 SH	MUS U130	Music of Asia	4 SH
SOC U256	Violence in the Family	4 SH	MUS U131	Music of Latin America and Caribbean	4 SH
SOC U268	The Social Movements of the 1960s	4 SH	MUS U132	Music of the Jewish People	4 SH
SOC U272	Social Roles in the Business World	4 SH	PHL U130	Ethics: East and West	4 SH
SOC U280	Sociology of Work	4 SH	PHL U275	Eastern Religions	4 SH
SOC U290	Juvenile Delinquency	4 SH	PHL U280	Islam	4 SH
SOC U295	Drugs and Society	4 SH	PHL U285	Jewish Religion and Culture	4 SH
			POL U375	Gender and Politics	4 SH
			POL U380	Latino Politics in the United States	4 SH
			POL U460	Government and Politics in Africa	4 SH
			SOC U260	Gender in a Changing Society	4 SH
			SOC U270	Race and Ethnic Relations	4 SH
				Approved Courses: Historical, Ethical, and Aesthetic Perspectives	
	Approved Courses: Diversity		AFR U109	Foundations of Black Culture 1	4 SH
AFR U128	Music of Africa	4 SH	ARC U223	American Architecture	4 SH
AFR U131	Music of Latin America and Caribbean	4 SH	ART U305	Renaissance Art	4 SH
AFR U140	African-American History	4 SH	ART U310	Nineteenth-Century Art	4 SH
AFR U180	African History	4 SH	ART U319	Gender and the Visual Arts	4 SH
AFR U261	The Modern Caribbean	4 SH	ART U320	American Art	4 SH
AFR U270	Economic Status of Ethnic Minorities	4 SH	BIO U143	Biology and Society	4 SH
AFR U337	African-American History before 1900	4 SH	CIN U240	Latin American Film	4 SH
AFR U338	African-American History since 1900	4 SH	CIN U260	Japanese Film	4 SH
AFR U391	Modern African Civilization	4 SH	CIN U265	Spanish Civil War on Film	4 SH
AFR U392	African Diaspora	4 SH	CIN U270	Modern German Film and Literature	4 SH
AFR U399	Black Community and Social Change	4 SH	CIN U280	French Film and Culture	4 SH
AFR U460	Contemporary Government and Politics in Africa	4 SH	CIN U386	History of Soviet Cinema	4 SH
AFR U609	History of South Africa	4 SH	CIN U460	Jewish Film	4 SH
ASL U150	Deaf People in Society	4 SH	ECN U230	Health Care and Medical Economics	4 SH
CIN U255	Chinese Film: Gender and Ethnicity	4 SH	ECN U240	Economics of Crime	4 SH
CJ U101	Introduction to Criminal Justice	4 SH	ECN U281	Economics of Art and Culture	4 SH
ECN U270	Economic Status of Ethnic Minorities	4 SH	ECN U290	The Global Economy	4 SH
ENG U671	Multiethnic Literature of the U.S.	4 SH	ECN U293	European Economic History	4 SH
ENG U672	Asian-American Literature	4 SH	ENG U226	Backgrounds in English and American Literature	4 SH
ENG U673	U.S. Latino/Latina Literature	4 SH	ENG U409	The Modern Novel	4 SH
ENG U674	American Indian Literature	4 SH	ENG U454	History of English	4 SH
ENG U675	Gay and Lesbian Literature	4 SH			
HNR U300	Topics in Research and Inquiry: A Diversity Perspective	4 SH			
HNR U320	Topics in Urban Experience: A Diversity Perspective	4 SH			
HNR U340	Topics in Contemporary Issues: A Diversity Perspective	4 SH			

ENG U519	American Novels 1	4 SH	LNS U250	Cervantes and His Times	4 SH
ENG U520	American Novels 2	4 SH	LNS U265	Spanish Civil War on Film	4 SH
ENG U611	Shakespeare	4 SH	LNS U550	Masterpieces of Spanish Literature Twelfth to Seventeenth Century	4 SH
ENG U621	Romantic Poetry	4 SH	MTH U203	Foundations of Mathematics	4 SH
ENG U676	Contemporary American Literature	4 SH	MUS U103	Music as a Social Expression	4 SH
ENG U687	Modern Poetry	4 SH	MUS U105	Music of the U.S.A.	4 SH
GEO U122	Age of Dinosaurs	4 SH	MUS U111	Rock Music	4 SH
GEO U220	History of Earth and Life	4 SH	MUS U116	Beethoven	4 SH
HNR U301	Topics in Research and Inquiry: An Historical, Ethical, or Aesthetic Perspective	4 SH	MUS U124	Music of the Romantic Era	4 SH
HNR U321	Topics in Urban Experience: An Historical, Ethical, or Aesthetic Perspective	4 SH	MUS U125	Twentieth-Century Music	4 SH
HNR U341	Topics in Contemporary Issues: An Historical, Ethical, or Aesthetic Perspective	4 SH	MUS U313	Historical Traditions 3: World	4 SH
HST U210	Atlantic Connection	4 SH	PHL U114	Critical Reasoning	4 SH
HST U211	World History since 1945	4 SH	PHL U130	Ethics: East and West	4 SH
HST U213	History of Violence	4 SH	PHL U135	Philosophical Problems of Law and Justice	4 SH
HST U215	Contemporary Controversies	4 SH	PHL U137	Philosophical Problems of War and Peace	4 SH
HST U231	History of the American Home	4 SH	PHL U140	Social and Political Philosophy	4 SH
HST U232	History of Boston	4 SH	PHL U145	Technology and Human Values	4 SH
HST U240	History of Sport in America	4 SH	PHL U160	Philosophical Problems of Economic Justice	4 SH
HST U250	Emergence of East Asia	4 SH	PHL U165	Moral Problems in Medicine	4 SH
HST U251	Modern East Asia	4 SH	PHL U170	Business Ethics	4 SH
HST U252	Japanese Literature and Culture	4 SH	PHL U180	Ecology Ethics	4 SH
HST U270	Ancient Greece	4 SH	POL U326	Premodern Political Thought	4 SH
HST U271	Ancient Rome	4 SH	POL U328	Modern Political Thought	4 SH
HST U272	The Invention of Europe	4 SH	POL U330	American Political Thought	4 SH
HST U273	Belief in Magic and Science in Europe	4 SH	POL U420	War and Political Violence	4 SH
HST U280	Hitler's Germany	4 SH	POL U440	Politics in Northern Ireland	4 SH
HST U281	Holocaust	4 SH	POL U450	Government and Politics in Russia	4 SH
HST U286	History of the Soviet Union	4 SH	POL U475	Government and Politics in Latin America	4 SH
HST U321	Technological Transformations	4 SH	POL U485	Government and Politics in China	4 SH
HST U322	Work and Leisure	4 SH	POL U530	Revolution and International Conflict	4 SH
HST U330	Colonial and Revolutionary America	4 SH	SOA U365	Sport, Culture, and Society	4 SH
HST U340	Cultural History of the U.S.	4 SH	SOC U245	Sociology of Poverty	4 SH
HST U342	Environmental History of North America	4 SH	SOC U285	Deviant Behavior and Social Control	4 SH
HST U343	History of Business in America	4 SH	THE U210	Theatre and Society	4 SH
HST U344	U.S. Urban History	4 SH	THE U500	Dramatic Theory/Criticism	4 SH
HST U370	Renaissance to Enlightenment	4 SH	Approved Courses: Analysis		
HST U376	The British Empire	4 SH	AFR U301	Foundations of Black Culture 2	4 SH
HST U386	History of Soviet Cinema	4 SH	AFR U500	Arts of the African Diaspora	4 SH
HST U475	The Culture of Europe	4 SH	AFR U600	Contemporary Issues: Race, Science, and Technology	4 SH
INT U240	War and Conflict in Nuclear Age	4 SH	ART U500	Arts of the African Diaspora	4 SH
LIN U454	History of English	4 SH	BIO U301	Genetics and Molecular Biology	4 SH
LNF U150	Introduction to French Culture	4 SH	with BIO U302 Lab for BIO U301		
LNF U280	French Film and Culture	4 SH	CHM U331	Bioanalytical Chemistry	5 SH
LNF U550	Masterpieces of French Literature 1	4 SH	CIN U350	Film Theory	4 SH
LNF U551	Masterpieces of French Literature 2	4 SH	CMN U410	Rhetorical Theory and Criticism	4 SH
LNG U270	Modern German Film and Literature	4 SH	ECN U291	Development Economics	4 SH
LNJ U260	Japanese Film	4 SH	ECN U420	Urban Economic Issues	4 SH
LNR U386	History of Soviet Cinema	4 SH	ECN U680	Industrial Organization and Public Policy	4 SH
LNS U150	Spanish Culture	4 SH	ENG U425	Literature and Law	4 SH
LNS U160	Latin American Culture	4 SH	ENG U427	The Literature of Science	4 SH
			ENG U450	Syntax	4 SH
			GEO U501	Geologic Field Seminar	4 SH
			GEO U510	Environmental Planning	4 SH

GEO U540	Sedimentary Basin Analysis	5 SH	PHL U460	Philosophy and Literature	4 SH
GEO U550	Geology and Land-Use Planning	4 SH	PHL U465	Advanced Medical Ethics	4 SH
GEO U560	Geographic Information Systems	5 SH	PHL U500	Theory of Knowledge	4 SH
HNR U302	Topics in Research and Inquiry: Focus on Analysis	4 SH	PHL U505	Metaphysics	4 SH
HNR U322	Topics in Urban Experience: Focus on Analysis	4 SH	PHL U510	Philosophy of Science	4 SH
HNR U342	Topics in Contemporary Issues: Focus on Analysis	4 SH	PHL U515	Advanced Logic	4 SH
HST U313	Gender and Revolution in Russia and China	4 SH	PHL U520	Philosophy of Logic	4 SH
HST U351	Japan since 1850	4 SH	PHL U525	Philosophy of Social Science	4 SH
HST U372	Gender and Society in Modern Europe	4 SH	PHL U530	Philosophy of Psychology	4 SH
HST U375	Culture and Identity in Early Modern England	4 SH	PHL U535	Philosophy of Mind	4 SH
HST U387	Soviet Secret Police	4 SH	PHL U540	Philosophy of Language	4 SH
HST U388	Borderlands: World War II in Eastern Europe	4 SH	PHL U901	Topics in Philosophy Seminar	4 SH
HST U411	Environment in the Age of Discovery	4 SH	PHL U902	Great Philosophers Seminar	4 SH
HST U450	Engendering China	4 SH	PHL U903	Seminar in Religion	4 SH
HST U990	Editing for Historical Publication	4 SH	PHL U904	Major Figures in Religious Studies	4 SH
IAF U400	International Conflict and Negotiation	4 SH	POL U165	Public Policy and Administration	4 SH
INT U310	Water Resources Policy and Management	4 SH	POL U370	Religion and Politics	4 SH
INT U600	Contemporary Issues: Race, Science, and Technology	4 SH	POL U390	Science, Technology, and Public Policy	4 SH
LIN U215	Symbolic Logic	4 SH	POL U405	International Political Economy	4 SH
LIN U450	Syntax	4 SH	POL U415	Ethnic Conflict in Comparative Politics	4 SH
LNS U551	Masterpieces of Spanish Literature 2	4 SH	POL U425	U.S. Foreign Policy	4 SH
MTH U430	Number Theory	4 SH	POL U435	Politics in Western Europe	4 SH
MTH U481	Probability and Statistics	4 SH	POL U445	Politics in Central and Eastern Europe	4 SH
MTH U525	Applied Analysis	4 SH	POL U465	Government and Politics in the Middle East	4 SH
MTH U530	Numerical Analysis	4 SH	POL U470	Arab-Israeli Conflict	4 SH
MTH U532	Numerical Solution of Differential Equations	4 SH	POL U480	Government and Politics in Japan	4 SH
MTH U541	Advanced Calculus	4 SH	POL U487	Politics of Developing Nations	4 SH
MTH U545	Fourier Series and PDEs	4 SH	SOA U500	Latin American Society and Development	4 SH
MTH U550	Real Analysis	4 SH	SOA U505	Native North Americans	4 SH
MTH U555	Complex Analysis	4 SH	SOC U402	Feminist Perspectives on Society	4 SH
MTH U560	Geometry	4 SH	SOC U406	Class, Crime, and the Legal System	4 SH
MTH U565	Topology	4 SH	SOC U415	Society and Culture in Russia	4 SH
MTH U571	Advanced Linear Algebra	4 SH	SOC U440	Sociology of Human Service Organization	4 SH
MTH U576	Rings and Fields	4 SH	SOC U470	Social Conflict and Community Service	4 SH
MTH U581	Statistics and Stochastic Processes	4 SH	SOC U485	Environment, Technology, and Society	4 SH
MTH U585	Introduction to Actuarial Math	4 SH	SOC U525	American Demographics	4 SH
MUS U108	Music and Poetry	4 SH	SOC U528	Computers and Society	4 SH
MUS U311	Historical Traditions 1: America	4 SH	THE U315	Theatre through the Lens of Modernism	4 SH
PHL U215	Symbolic Logic	4 SH			
PHL U265	Latin American Religions	4 SH			
PHL U325	Ancient Philosophy	4 SH			
PHL U330	Modern Philosophy	4 SH			
PHL U340	Philosophy of Human Nature	4 SH			
PHL U390	Cults and Sects	4 SH			
PHL U435	Moral Philosophy	4 SH			
PHL U440	Aesthetics	4 SH			
PHL U445	Philosophy of Religion	4 SH			

AFRICAN-AMERICAN STUDIES

KWAMINA PANFORD, PhD
Associate Professor and Chair

COLLEGE OF ARTS AND SCIENCES
DISTINGUISHED PROFESSOR
Patrick Manning, PhD

PROFESSOR
Ronald W. Bailey, PhD

ASSOCIATE PROFESSORS

Leonard L. Brown, PhD
 Robin M. Chandler, PhD
 Jordan Gebre-Medhin, PhD
 Robert L. Hall, PhD
 William Lowe, MA

ASSISTANT PROFESSOR

Emmett G. Price, PhD

VISITING ASSISTANT PROFESSOR

Robin Kilson, PhD

ASSOCIATED FACULTY

Oscar Brookins, PhD, *Economics*
 Edward A. Bullins, MFA, *Center for the Arts*
 Cassandra Jackson, PhD, *English*
 Donald M. Jacobs, PhD, *History*
 Lester P. Lee, MA, *History and Cooperative Education*
 William F. Miles, PhD, *Political Science*
 Peter C. Murrell, PhD, *Education*
 Joseph D. Warren, PhD, *Government Relations and
 Community Affairs*

The diverse experiences of black people—in the United States, Africa, the Caribbean, South America, and other parts of the world—are the focus of the field of African-American studies. The curriculum is interdisciplinary in approach and includes historical, social and behavioral, and cultural studies. International studies and contemporary public policy issues are also integral parts of the program. In class, in co-op, and in internships, students apply theoretical knowledge to real-world problems and concerns. Study-abroad programs exist in Ghana, Egypt, and South Africa. Negotiations are under way to establish additional study-abroad programs in Africa, the Caribbean, and Central and South America.

Students with training in African-American studies have the knowledge to meet the challenges posed by diverse racial, cultural, and ethnic groups in the United States and abroad. Many graduates attend professional schools or teach at the secondary or the college level. Others work in museums, libraries, or research centers; in business; or in public service, social service, or law-enforcement agencies. See pages 191–198 for course descriptions.

BA in African-American Studies

COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS

See page 40 for requirement list.

AFRICAN-AMERICAN STUDIES MAJOR REQUIREMENTS

Introductory Courses

Complete the following three courses:

AFR U101	African-American Studies	4 SH
AFR U109	Foundations of Black Culture 1	4 SH
AFR U185	Gender in the African Diaspora	4 SH

Literature

Complete the following course:

AFR U663	Early African-American Literature	4 SH
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Research and Seminar

Complete the following two courses:

AFR U310	Applied Research in African Diaspora	4 SH
AFR U700	Advanced Seminar	4 SH

Electives

Complete six African-American studies courses at the intermediate and advanced level (AFR U300 or above).

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

AFRICAN-AMERICAN STUDIES MAJOR

Complete 48 semester hours for the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in African-American Studies

COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR SOCIAL SCIENCE MAJORS
 See page 42 for requirement list.

AFRICAN-AMERICAN STUDIES MAJOR REQUIREMENTS

Introductory Courses

Complete the following three courses:

AFR U101	African-American Studies	4 SH
AFR U109	Foundations of Black Culture 1	4 SH
AFR U185	Gender in the African Diaspora	4 SH

Literature

Complete the following course:

AFR U663	Early African-American Literature	4 SH
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Research and Seminar

Complete the following two courses:

AFR U310	Applied Research in African Diaspora	4 SH
AFR U700	Advanced Seminar	4 SH

Electives

Complete six African-American studies courses at the intermediate and advanced level (300 level or above).

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

AFRICAN-AMERICAN STUDIES MAJOR

Complete 48 semester hours for the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in African-American Studies**REQUIRED COURSES**

Complete the following four courses:

AFR U101	African-American Studies	4 SH
AFR U109	Foundations of Black Culture 1	4 SH
AFR U185	Gender in the African Diaspora	4 SH
AFR U310	Applied Research in African Diaspora	4 SH
or AFR U700	Advanced Seminar	4 SH

ELECTIVE COURSE

Choose one additional course in consultation with the department.

GPA REQUIREMENTS

2.000 GPA required in the minor

AMERICAN SIGN LANGUAGE–ENGLISH INTERPRETING

DENNIS R. COKELY, PhD

Associate Professor and Director

LECTURERS

Alma L. Bournazian, MS

Cathy Cogen, MA

James Lipsky, BS

George Phelgrim, MA

American Sign Language (ASL) is a language used by large numbers of people in the United States and Canada. By mastering ASL, students gain both access to the culture of Deaf America and insights into features of spoken language that are often taken for granted. Learning a modally different language gives students a new sense of the power of language and an appreciation of how it shapes their world. In this way, the mastery of ASL sharpens critical-thinking skills.

The program provides a firm foundation in language, linguistics, culture, and interpreting, plus a broad-based liberal arts education. American Sign Language courses are integral to degrees in human services with a specialization in deaf studies and in linguistics with a focus on ASL.

Opportunities for ASL–English interpreters are increasing, due to federal and state legislation. Graduates work as interpreters in such areas as higher education, advanced technology, and theatre.

The ASL Interpreter Education Project seeks to enhance the skills of interpreters currently working in the field and to increase the supply of competent interpreters in New England. See pages 206–209 for course descriptions.

BS in American Sign Language

COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR ARTS/HUMANITIES MAJORS
See page 41 for requirement list.

AMERICAN SIGN LANGUAGE MAJOR REQUIREMENTS*American Sign Language*

Complete the following four courses:

ASL U101	Elementary ASL 1	4 SH
ASL U102	Elementary ASL 2	4 SH
ASL U301	Intermediate ASL 1	4 SH
ASL U302	Intermediate ASL 2	4 SH

Social and Cultural World

Complete the following two courses:

ASL U150	Deaf People in Society	4 SH
ASL U350	Deaf History and Culture	4 SH

Linguistics

Complete the following three courses:

LIN U150	Introduction to Language and Linguistics	4 SH
ASL U460	ASL Linguistics	4 SH
ASL U560	ASL-English Contrastive Analysis	4 SH

Interpreting

Complete the following five courses:

ASL U510	Interpreting Inquiry Texts	4 SH
ASL U515	Interpreting Narrative Texts	4 SH
ASL U550	The Interpreting Profession	2 SH
ASL U610	Interpreting Expository Texts	4 SH
ASL U615	Interpreting Persuasive Texts	4 SH

Interpreting Practicum

Complete the following practicum:

ASL U950	Interpreting Practicum	4 SH
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Ethics

Complete the following two courses:

ASL U650	Ethical Decision Making	4 SH
ASL U651	Ethical Fieldwork	2 SH

Research Capstone

Complete the following capstone:

ASL U960	Interpreting Research Practicum	4 SH
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EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

GPA REQUIREMENTS**Minimum 2.750 GPA required in all ASL courses****Minimum 2.500 overall GPA required****AMERICAN SIGN LANGUAGE****Complete 72 semester hours in the major.****GENERAL ELECTIVES****Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.****COOPERATIVE EDUCATION****If elected****UNIVERSITY-WIDE REQUIREMENTS****128 total semester hours required****Minimum 2.000 GPA required****ARCHITECTURE****GEORGE THRUSH, MARCH***Associate Professor and Chair***PROFESSORS****Mardges Bacon, PhD****Elizabeth C. Cromley, PhD****ASSISTANT PROFESSORS****Timothy Love, MArch****Peter H. Wiederspahn, MArch****Mo Zell, MArch****LECTURERS****Dan Anderson, MArch, MDes****Anne-Sophie Divenyi, MArch****Randa Ghattas, MArch****Kristen Giannattasio, MArch****Michael T. Grant, MArch****Garen B. Gregorian, MSCE****Chris Grimley, MArch****Timothy W. Hyde, MArch****Michael LeBlanc, MArch****Matthew Littell, MArch****Jodie A. Manasevit, MFA****Lucy Maulsby, MPhil****Mark E. Pasnik, MArch****Michael Sewell, MArch****Scott A. Slarsky, MArch**

Architecture is the context for civic life. In an age of increasingly rapid technological and social change, architects must find ways to forge connections between our past and our future. That involves critical thinking about many complex contemporary issues, such as the relationship of public and

private life, the interaction between formal and political ideas in cities, and the role of technology in contemporary architecture and design. Because the process of designing buildings involves the synthesis of disparate elements, it can also translate into strategies for approaching a wide range of other problems not traditionally understood to be “architecture.”

At Northeastern, we connect specific problem solving inherent to architectural understanding with the larger context of contemporary cities.

The curriculum teaches students to conceptualize, synthesize, and represent complex architectural and urban issues. The program focuses on core skills and critical thinking as preparation for both professional practice and advanced study. The curriculum in the design studio encompasses two major themes: first, the studio projects focus on the art of building, and second, the projects explore how buildings affect urban conditions. Buildings meet both our individual need for shelter and our shared need for cultural meaning. The art of building includes the study of building construction and technology, as well as the cultural messages created by the expression of material, structure, and form in architecture. The contemporary city is our laboratory. This urban focus requires that students integrate their own creative impulses with the future of the society of which they will be a part. By building on the practical and technical training afforded by co-op to develop core professional skills, the curriculum focuses on architecture’s fundamental aesthetic, technological, social, and political aspects.

With the effective synthesis of the art of building with urban issues, Northeastern’s program in architecture is becoming a leader in identifying opportunities for civic representation, urban development, and neighborhood design. Northeastern’s students are in demand in area offices because of their combination of professional competence and fluency in urban architectural issues. There are opportunities for interdisciplinary cooperation in urban-oriented research and creative work in areas such as GIS mapping, urban economics and development, new forms of spatial and visual communication, and public policy.

In addition, complete the arts and sciences core curriculum and the experiential education requirement (see page 30).

BS in Architecture

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR ARTS/HUMANITIES MAJORS
See page 41 for requirement list.

ARCHITECTURE MAJOR REQUIREMENTS*Breadth Courses***CALCULUS**

Complete the following course in calculus:

MTH U241 Calculus 1 for Science and Engineering 4 SH

PHYSICS

Complete the following course with corresponding lab:

PHY U141 Physics for Engineering Technology 1 4 SH

Architecture Requirements

FOUNDATION SKILLS

Complete the following four courses:

ARC U111 History of World Architecture 1 4 SH

ARC U112 History of World Architecture 2 4 SH

ARC U256 Manual Representation 4 SH

ARC U257 Digital Representation 4 SH

HISTORY/THEORY

Complete the following four courses:

ARC U325 Nineteenth-Century Architecture and Urbanism 4 SH

ARC U326 Twentieth-Century Architecture and Urbanism 4 SH

ARC U329 American Houses and Housing 4 SH

ARC U330 Third-Year Seminar 4 SH

TECHNOLOGY

Complete the following five courses:

ARC U356 Structures 1: Statics 4 SH

ARC U357 Structures 2: Tectonics 4 SH

ARC U358 Modeling and Design Communication 4 SH

ARC U555 Environmental Systems 4 SH

ARC U656 Integrated Building Systems 4 SH

STUDIO DESIGN

Complete the following five courses:

ARC U310 Studio 1: Site, Type, Composition 6 SH

ARC U311 Studio 2: Pattern and Urban Design 6 SH

ARC U410 Studio 3: Building beyond the City 6 SH

ARC U510 Studio 4: Housing and Aggregation 6 SH

ARC U511 Studio 5: Tectonics 6 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

GRADE/GPA REQUIREMENTS

Minimum 2.500 GPA required

ARCHITECTURE MAJOR

Complete 82 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

128 total semester hours required

Minimum 2.000 GPA required

Minor in Architectural History**REQUIRED COURSES**

Complete the following four courses:

ARC U111 History of World Architecture 1 4 SH

ARC U112 History of World Architecture 2 4 SH

ARC U325 Nineteenth-Century Architecture and Urbanism 4 SH

ARC U326 Twentieth-Century Architecture and Urbanism 4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

BEHAVIORAL NEUROSCIENCE

DENISE JACKSON, PhD

Associate Professor of Psychology and Acting Program Director

PROGRAM ADVISORY BOARD

Joseph Ayers, PhD, *Department of Biology*

Frederick C. Davis, PhD, *Department of Biology*

Michelle L. Israel, *Arts and Sciences Associate Cooperative Education Coordinator*

Richard H. Melloni Jr., PhD, *Department of Psychology*

Franklin Naarendorp, PhD, *Department of Psychology*

Donald M. O'Malley, PhD, *Department of Biology*

James R. Stellar, PhD and Dean, *College of Arts and Sciences Dean's Office*

The behavioral neuroscience major is an interdepartmental program for undergraduates, with a program director and advisory board made up of the neuroscience faculty of the College of Arts and Sciences. The field of neuroscience focuses on brain mechanisms and how they give rise to behavioral functions in humans and animals. Behavioral neuroscience combines the disciplines of biology and psychology with a strong background in basic physical sciences and mathematics. The goal is to achieve an understanding of anatomy and physiology nerve cells, chemical transmission, simple neural circuits, and fundamental biological processes such as inheritance and development, and then to see how these biological events give rise to normal and pathological behavior. The primary objective of the neuroscience major is to draw together faculty and students who are interested in this interdisciplinary topic and to provide undergraduates with an education in the field. This major serves as ideal preparation for advancement to graduate programs in the field of neuroscience or to biology or psychology programs with an emphasis in neurobiology. This major also serves as preparation for admission to medical school, although there are additional science courses that should be taken as electives. The curriculum also prepares students to find employment in clinical settings or in allied fields such as the biotech industry.

For further information, see www.neuroscience.neu.edu or contact Denise Jackson, preferably at d.jackson@neu.edu. Phone messages may be left at 617.373.3860.

BS in Behavioral Neuroscience

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR NATURAL SCIENCE MAJORS
See page 41 for requirement list.

BEHAVIORAL NEUROSCIENCE MAJOR REQUIREMENTS

Foundation Courses

PSYCHOLOGY

Complete the following course:

PSY U101 Foundations of Psychology 4 SH

MATHEMATICS

Complete two courses:

MTH U141 Calculus 1 4 SH

or MTH U151 Calculus and Differential Equations 4 SH
for Biology 1

MTH U142 Calculus 2 4 SH

or MTH U152 Calculus and Differential Equations 4 SH
for Biology 2

SCIENCE

Complete the following four courses with corresponding labs:

BIO U101 Principles of Biology 1 4 SH

with BIO U102 Lab for BIO U101 1 SH

BIO U301 Genetics and Molecular Biology 4 SH

with BIO U302 Lab for BIO U301 1 SH

CHM U211 General Chemistry 1 5 SH

CHM U214 General Chemistry 2 5 SH

Level-Two Courses

PSYCHOLOGY

Complete the following three courses with one corresponding lab:

PSY U320 Statistics in Psychological Research 5 SH

PSY U458 Psychobiology 4 SH

PSY U510 Psychopharmacology 4 SH

SCIENCE

Complete the following three courses with corresponding labs:

BIO U405 Neurobiology 4 SH

or BIO U319 Regulatory Cell Biology 4 SH

with BIO U320 Lab for BIO U319 1 SH

CHM U311 Organic Chemistry 1 5 SH

CHM U313 Organic Chemistry 2 5 SH

SEMINAR

Complete one seminar from the following list:

PSY U654 Seminar in Behavioral Modification 4 SH

PSY U656 Seminar in Psychobiology 4 SH

PSY U658 Seminar in Psycholinguistics 4 SH

PSY U660 Seminar in Cognition 4 SH

PSY U666 Seminar in Clinical Psychology 4 SH

PSY U668 Seminar in Sensation and Perception 4 SH

BIO U403 Animal Behavior 4 SH

BIO U409 Current Topics in Biology 4 SH

BIO G385 Bioinformatics Seminar 2 SH

LABORATORY COURSE

Complete one laboratory course from the following list:

PSY U602 Experiments in Learning and Motivation 4 SH

PSY U604 Laboratory in Learning and Motivation 4 SH

PSY U606 Laboratory in Psychobiology 4 SH

PSY U608 Lab in Animal Behavior Research 4 SH

PSY U610 Laboratory in Psycholinguistics 4 SH

PSY U612 Laboratory in Cognition 4 SH

PSY U622 Laboratory in Sensation and Perception 4 SH

PSY U924 Directed Study 4 SH

PSY U970 Junior/Senior Project 1 4 SH

PSY U971 Junior/Senior Project 2 4 SH

BIO U579 Biochemistry Methods Laboratory 5 SH

Level-Three Courses

AREA A: PSYCHOLOGY COURSES

Complete one course from the following list:

PSY U202 Biological Basis of Mental Illness 4 SH

PSY U358 Behavior Therapies 4 SH

PSY U400 Personality 4 SH

PSY U402 Social Psychology 4 SH

PSY U404 Developmental Psychology 4 SH

PSY U406 Abnormal Psychology 4 SH

AREA B: PSYCHOLOGY ELECTIVES

Complete two courses from the following list:

PSY U450 Learning and Motivation 4 SH

PSY U452 Introduction to Sensation and Perception 4 SH

PSY U464 Psychology of Language 4 SH

PSY U466 Cognition 4 SH

PSY U512 Neuropsychology 4 SH

PSY U520 Language and the Brain 4 SH

AREA C: BIOLOGY ELECTIVES

Complete two courses with corresponding labs from the following list:

BIO U303 Human Anatomy and Physiology 1 4 SH

with BIO U304 Lab for BIO U303 1 SH

BIO U305 Human Anatomy and Physiology 2 4 SH

with BIO U306 Lab for BIO U305 1 SH

BIO U311 Ecology 4 SH

with BIO U312 Lab for BIO U311 1 SH

BIO U315 Invertebrate Zoology 4 SH

with BIO U316 Lab for BIO U315 1 SH

BIO U317 Vertebrate Zoology 4 SH

with BIO U318 Lab for BIO U317 1 SH

BIO U319 Regulatory Cell Biology 4 SH

with BIO U320 Lab for BIO U319 1 SH

BIO U321 Microbiology 4 SH

with BIO U322 Lab for BIO U321 1 SH

BIO U323 Biochemistry 4 SH

with BIO U324 Lab for BIO U323 1 SH

BIO U401 Comparative Vertebrate Anatomy 4 SH

with BIO U402 Lab for BIO U401 1 SH

BIO U403	Animal Behavior	4 SH
BIO U405	Neurobiology	4 SH
BIO U407	Molecular Cell Biology	4 SH
BIO U503	Marine Invertebrate Zoology	4 SH
with BIO U504	Lab for BIO U503	1 SH
BIO U545	Neuroethology	4 SH
with BIO U546	Lab for BIO U545	1 SH
BIO U551	Principles of Animal Physiology	4 SH
with BIO U552	Lab for BIO U551	1 SH
BIO U553	Biology of Muscle: Molecules to Movements	4 SH
BIO U565	Mammalogy	4 SH
with BIO U566	Lab for BIO U565	1 SH
BIO U569	Microbial Physiology and Genetics	4 SH
BIO U573	Medical Microbiology	4 SH
with BIO U574	Lab for BIO U573	1 SH
BIO U575	Parasitology	4 SH
with BIO U576	Lab for BIO U575	1 SH
BIO U577	Developmental Biology	4 SH
with BIO U578	Lab for BIO U577	1 SH
BIO U583	Immunology	4 SH
BIO U585	Evolution	4 SH
with BIO U586	Lab for BIO U585	1 SH
BIO U587	Comparative Neurobiology	4 SH

Experiential Education Requirement

Complete a reflective or nonreflective course.

REFLECTIVE COMPONENT OF A PRACTICAL EXPERIENCE

Complete one of the following courses:

BIO U701	Biology Capstone	4 SH
PSY U650	Seminar in Clinical Case Study	4 SH
PSY U652	Seminar in Ethics in Psychology	4 SH
PSY U654	Seminar in Behavioral Modification	4 SH
PSY U934	Independent Study	4 SH
PSY U951	Experiential Education Directed Study	4 SH

NONREFLECTIVE COMPONENT

Complete one course from the following list:

PSY U618	Laboratory in Community Psychology	4 SH
PSY U940	Internship in Psychology	4 SH
PSY U970	Junior/Senior Project 1	4 SH
PSY U971	Junior/Senior Project 2	4 SH

BEHAVIORAL NEUROSCIENCE MAJOR

Complete 88 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BIOCHEMISTRY

Biochemistry includes nearly the entire spectrum of science—from physics and chemistry to biology and medicine. The biochemistry major, sponsored jointly by the departments of biology and chemistry, provides a strong foundation in mathematics and the physical sciences as well as thorough training in biochemistry, biology, and chemistry. In addition to formal classwork, opportunities are available for participation in faculty research programs on an individual basis or through the honors program. The large number of biotechnology companies and biomedical facilities in the Boston area provides a rich source of opportunities through Northeastern's program of cooperative education.

A Bachelor of Science degree in biochemistry allows students to enter the job market directly or go on to graduate, medical, veterinary, dental, law, or business school. Students may find positions in biotechnology companies, pharmaceutical companies, or government agencies, working in laboratory or clinical research, quality control, production, information systems, marketing, or technical sales. Students may also pursue graduate study in biochemistry, molecular biology, cell biology, biophysics, genetics, toxicology, biotechnology, clinical chemistry, animal science, nutrition, plant science, or other biomedical sciences.

Students who are interested in attending medical, dental, or veterinary school following graduation are urged to consult with the preprofessional advisory committee early in their careers at Northeastern.

To graduate with a major in biochemistry, a student must have a cumulative grade-point average (GPA) of 2.000 for all science and mathematics courses required for the major.

Students must maintain a minimal grade-point average of 2.000 to remain in this program. In addition, students must complete the arts and sciences core curriculum and experiential education requirement.

BS in Biochemistry

COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR NATURAL SCIENCE MAJORS
See page 41 for requirement list.

BIOCHEMISTRY BREADTH COURSES*Mathematics Courses*

Complete the following two courses:

MTH U151	Calculus and Differential Equations for Biology 1	4 SH
MTH U152	Calculus and Differential Equations for Biology 2	4 SH

Physics Courses

Complete two courses with corresponding lab:

PHY U145	Physics for Life Sciences 1	5 SH
or PHY U151	Physics for Engineering 1	5 SH
PHY U147	Physics for Life Sciences 2	5 SH
or PHY U155	Physics for Engineering 2	5 SH

Computer Science Course

Complete one approved computer science course:

CET U301	Introduction to C++ Programming	4 SH
CS U211	Fundamentals of Computer Science 1	4 SH
GE U111	Engineering Problem Solving and Computation	4 SH
PHY U500	Physics with Computers	4 SH

BIOCHEMISTRY MAJOR REQUIREMENTS

Principles of Biology

Complete the following two courses with corresponding labs:

BIO U101	Principles of Biology 1	4 SH
with BIO U102	Lab for BIO U101	1 SH
BIO U103	Principles of Biology 2	4 SH
with BIO U104	Lab for BIO U103	1 SH

Molecular Biology

Complete the following two courses with corresponding lab:

BIO U301	Genetics and Molecular Biology	4 SH
with BIO U302	Lab for BIO U301	1 SH
BIO U407	Molecular Cell Biology	4 SH

Chemistry Courses

Complete the following six courses with corresponding labs:

CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH
CHM U311	Organic Chemistry 1	5 SH
CHM U313	Organic Chemistry 2	5 SH
CHM U321	Analytical Chemistry	5 SH
CHM U401	Physical Chemistry 1	5 SH

Biochemistry Courses

Complete the following course and corresponding lab:

BIO U323	Biochemistry	4 SH
with BIO U324	Lab for BIO U323	1 SH

Capstone

Complete one of the following courses:

BIO U701	Biology Capstone	4 SH
or CHM U770	Chemistry Capstone	4 SH

Biology and Chemistry Advanced Electives

Choose four advanced courses from the Department of Biology or Chemistry and Chemical Biology including one approved lab course for a total of at least 17 hours:

BIO U311 to BIO U699
CHM U310 to CHM U699

LABS:

BIO U579	Biochemistry Methods Laboratory	5 SH
CHM U331	Bioanalytical Chemistry	5 SH
CHM U521	Instrumental Methods of Analysis	5 SH
CHM U531	Chemical Synthesis Characterization	5 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one co-op experiential direct research or see department for approved activities.

BIOCHEMISTRY MAJOR

Complete 96 semester hours for the major with a cumulative GPA of 2.000.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

136 total semester hours required

Minimum 2.000 GPA required

BIOLOGY

SUSAN POWERS-LEE, PhD

Professor and Chair

MATTHEWS DISTINGUISHED UNIVERSITY PROFESSORS

Phyllis R. Strauss, PhD

Carol M. Warner, PhD

PROFESSORS

Ahmed T. Abdelal, PhD

H. William Detrich, PhD

Edward L. Jarroll, PhD

Gwilym S. Jones, PhD

Kim Lewis, PhD

James M. Manning, PhD

Richard L. Marsh, PhD

Charles A. M. Meszoely, PhD

COLLEGE OF ARTS AND SCIENCES

DISTINGUISHED ASSOCIATE PROFESSOR

Wendy A. Smith, PhD

ASSOCIATE PROFESSORS

Joseph L. Ayers, PhD

Kostia Bergman, PhD

Donald P. Cheney, PhD

Frederick C. Davis, PhD

Charles H. Ellis Jr., PhD

Jacqueline M. Piret, PhD

Daniel C. Scheirer, PhD

ASSISTANT PROFESSORS

Slava S. Epstein, PhD

Valentin A. Ilyin, PhD

Donald M. O'Malley, PhD

Rebeca B. Rosengaus, PhD

Geoffrey C. Trussell, PhD

By majoring in biology, students develop a basic understanding of the organization and the processes of life, from molecules and cells through organs and organ systems to populations, species, ecosystems, and evolution. The major offers the mathematical, chemical, and physical background necessary for understanding biology and the practical scientific skills associated with each of these areas. It allows students to begin to specialize in a subdiscipline of biology such as animal physiology, cell biology, ecology, marine biology/microbiology, molecular biology, plant biology, zoology, and so forth. Numerous opportunities for relevant positions are available through Northeastern's program of cooperative education. A marine biology concentration, designed to provide biology majors with a strong foundation in marine biology and related disciplines, is now offered through the Northeastern University Marine Science Center in Nahant.

The undergraduate biology major prepares students for careers in the life sciences, including medical, dental, and other health-related fields. Students may find employment in federal, state, industrial, hospital, or university laboratories or in industries involved in the manufacture and distribution of pharmaceuticals, biological products, food, or scientific equipment. Biologists also work in fisheries, forestry services, county and state agencies, museums, aquariums, research vessels, and marine stations. Graduate study culminating in a master's or doctoral degree can lead to careers in upper-level teaching or research in any of the life sciences.

Premedical, pre dental, and other preprofessional students are urged to consult with the preprofessional advisory committee early in their careers at Northeastern.

To graduate with a major in biology, a student must have a cumulative GPA of 2.000 for all science and mathematics courses required for the major.

BS in Biology

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR NATURAL SCIENCE MAJORS
See page 41 for requirement list.

BREADTH COURSES FOR BIOLOGY

Mathematics

Complete the following two courses:

MTH U151 Calculus and Differential Equations 4 SH
for Biology 1

MTH U152 Calculus and Differential Equations 4 SH
for Biology 2

Chemistry

Complete the following four courses with corresponding labs:

CHM U211 General Chemistry 1 5 SH

CHM U214 General Chemistry 2 5 SH

CHM U311 Organic Chemistry 1 5 SH

CHM U313 Organic Chemistry 2 5 SH

Physics

Complete two courses with corresponding labs from the following list (PHY U145 and PHY U147 are recommended):

PHY U145 Physics for Life Sciences 1 5 SH

or PHY U151 Physics for Engineering 1 5 SH

or PHY U161 Physics 1 5 SH

PHY U147 Physics for Life Sciences 2 5 SH

or PHY U155 Physics for Engineering 2 5 SH

or PHY U165 Physics 2 5 SH

Intermediate or Advanced Science

Complete one intermediate or advanced science course from the following list:

BIO U311 to BIO U699

CHM U321 Analytical Chemistry 5 SH

CHM U331 to CHM U699

GEO U300 to GEO U699

MTH U280 to MTH U699

PHY U303 to PHY U699

PSY U202 Biological Basis of Mental Illness 4 SH

PSY U458 Psychobiology 4 SH

PSY U510 Psychopharmacology 4 SH

BIOLOGY MAJOR REQUIREMENTS

Required Biology

Complete the following three courses with corresponding labs:

BIO U101 Principles of Biology 1 4 SH

with BIO U102 Lab for BIO U101 1 SH

BIO U103 Principles of Biology 2 4 SH

with BIO U104 Lab for BIO U103 1 SH

BIO U301 Genetics and Molecular Biology 4 SH

with BIO U302 Lab for BIO U301 1 SH

Experiential Education Introduction

Complete the following course:

BIO U106 Introduction to Experiential Education 1 SH

BIOLOGY MAJOR ELECTIVES

Cellular and Molecular Biology

Complete one course and corresponding lab from the following list:

BIO U319 Regulatory Cell Biology 4 SH

with BIO U320 Lab for BIO U319 1 SH

or BIO U321 Microbiology 4 SH

with BIO U322 Lab for BIO U321 1 SH

or BIO U323 Biochemistry 4 SH

with BIO U324 Lab for BIO U323 1 SH

Organismal and Population Biology

Complete one course and corresponding lab from the following list:

BIO U311 Ecology 4 SH

with BIO U312 Lab for BIO U311 1 SH

or BIO U313 Plant Biology 4 SH

with BIO U314 Lab for BIO U313 1 SH

or BIO U315 Invertebrate Zoology 4 SH

with BIO U316 Lab for BIO U315 1 SH

or BIO U317 Vertebrate Zoology 4 SH

with BIO U318 Lab for BIO U317 1 SH

Intermediate and Advanced Biology

Complete three biology courses (at least 13 semester hours) at level BIO U311 or above.

Biology Capstone

Complete the following course:

BIO U701 Biology Capstone 4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

BIOLOGY MAJOR

Complete 83 semester hours for the major with a cumulative GPA of 2.000.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

136 total semester hours required

Minimum 2.000 GPA required

Minor in Biology**REQUIRED COURSES**

Complete five biology courses.

BREADTH COURSE

Choose one CHM, GEO, MTH, or PHY course that serves as a prerequisite.

REQUIRED LABS

Three of the six courses must contain a lab component.

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Marine Biology**REQUIRED COURSES**

Complete the following two courses:

BIO U101 Principles of Biology 1 4 SH

BIO U103 Principles of Biology 2 4 SH

ELECTIVE COURSES

Choose three courses from the following list:

BIO U151 Introduction to Marine Biology 4 SH

BIO U315 Invertebrate Zoology 4 SH

BIO U501 Marine Botany 4 SH

with BIO U502 Lab for BIO U501 1 SH

BIO U503 Marine Invertebrate Zoology 4 SH

with BIO U504 Lab for BIO U503 1 SH

BIO U505 Biology of Corals and Coral Reefs 3 SH

BIO U507 Biology and Ecology of Fishes 3 SH

BIO U509 Marine Birds and Mammals 2 SH

with BIO U510 Lab for BIO U509 1 SH

BIO U511 Adaptations of Aquatic Organisms 3 SH

BIO U513 Tropical Terrestrial Ecology 1 SH

BIO U515 Benthic Marine Ecology 3 SH

BIO U517 Oceanography 2 SH

with BIO U518 Lab for BIO U517 1 SH

BIO U519 Ocean and Coastal Processes 3 SH

BIO U521 Experimental Design Marine Ecology 4 SH

with BIO U522 Lab for BIO U521 1 SH

BIO U523 Molecular Marine Biology 3 SH

BIO U525 Marine Microbial Ecology 2 SH

with BIO U526 Lab for BIO U525 1 SH

DIRECTED STUDY

Complete 4 semester hours of directed study:

BIO U921 Directed Study 1 SH

BIO U922 Directed Study 2 SH

BIO U923 Directed Study 3 SH

BIO U924 Directed Study 4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

BIOMEDICAL PHYSICS**FACULTY LISTED UNDER PHYSICS**

At the most basic level, biomedical physics seeks to understand the role of physical processes occurring on molecular, cellular, or macroscopic scales, in vital biological functions, ranging from the extraction of oxygen from the lungs by red blood cells to the generation of complex electrical signals in the brain and nervous system. At the most practical level, biomedical physics examines how physical principles and modern instrumentation techniques can be used in a rapidly increasing number of medical applications, ranging from imaging tissue structures and organ functions, to detecting and curing diseases, to performing sophisticated surgeries.

BS in Biomedical Physics**COLLEGE OF ARTS AND SCIENCES BS CORE****REQUIREMENTS FOR NATURAL SCIENCE MAJORS**

See page 41 for requirement list.

BIOMEDICAL PHYSICS MAJOR REQUIREMENTS**Introductory Physics**

Complete the following two courses with corresponding labs:

PHY U161 Physics 1 5 SH

PHY U165 Physics 2 5 SH

Intermediate Physics

Complete the following three courses:

PHY U303 Modern Physics 4 SH

PHY U305 Thermodynamics and Statistical Mechanics 4 SH

PHY U371 Electronics 4 SH

Advanced Physics

Complete the following three courses:

PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U602	Electricity and Magnetism	4 SH
PHY U603	Electromagnetic Waves and Optics	4 SH

Biomedical Physics

Complete the following four courses:

PHY U621	Biological Physics 1	4 SH
PHY U623	Medical Physics	4 SH
PHY U651	Medical Physics Seminar 1	4 SH
PHY U652	Medical Physics Seminar 2	4 SH

Senior Capstone and Experiential Education

Complete the following two courses:

PHY U700	Advanced Physics Laboratory 2	4 SH
PHY U954	Experiential Education Directed Study	4 SH

BREADTH COURSES FOR BIOMEDICAL PHYSICS MAJOR

Mathematics Courses

Complete the following three calculus courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH

General Engineering

Complete one general engineering course.

Biology

Complete the following two courses with corresponding labs:

BIO U111	General Biology 1	4 SH
with BIO U112	Lab for BIO U111	1 SH
BIO U113	General Biology 2	4 SH
with BIO U114	Lab for BIO U113	1 SH

Chemistry

Complete the following course:

CHM U101	General Chemistry for Health Sciences	5 SH
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Technical Electives

Choose two intermediate or advanced courses from the following departments:

BIO U300 to BIO U699
CHE U300 to CHE U699
CHM U300 to CHM U699
CIV U300 to CIV U699
CS U300 to CS U699
ECE U300 to ECE U699
GEO U300 to GEO U699
MIM U300 to MIM U699
MTH U300 to MTH U699
PHY U300 to PHY U699

BS BIOMEDICAL PHYSICS MAJOR

Complete 94 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

CHEMISTRY AND CHEMICAL BIOLOGY

DAVID A. FORSYTH, PhD

Professor and Chair

MATTHEWS DISTINGUISHED UNIVERSITY PROFESSOR

Geoffrey Davies, DSc

PROFESSORS

Bill C. Giessen, ScD

William S. Hancock, PhD

Robert N. Hanson, PhD

Graham B. Jones, PhD, DIC

Barry L. Karger, PhD

Philip W. LeQuesne, PhD, DSci

Mary Jo Ondrechen, PhD

William M. Reiff, PhD

Paul Vouros, PhD

Philip M. Warner, PhD

ASSOCIATE PROFESSORS

David E. Budil, PhD

Thomas R. Gilbert, PhD

Rein U. Kirss, PhD

Ira S. Krull, PhD

Patricia A. Mabrouk, PhD

ASSISTANT PROFESSORS

Norman Chiu, PhD

Sanjeev Mukerjee, PhD

Eriks Rozners, PhD

LABORATORY COORDINATOR

Edward H. Witten, PhD

PROFESSORS EMERITI

John L. Roebber, PhD

Alfred Viola, PhD

The Department of Chemistry and Chemical Biology provides education in basic chemistry and modern chemistry-related disciplines. The department offers an American Chemical Society–certified program leading to a Bachelor of Science in chemistry, and also offers a Bachelor of Science in biochemistry jointly with the Department of Biology. The overall objective of the Bachelor of Science in chemistry major program is to provide the fundamental scientific background and practical training for students as they prepare for chemically related

careers or advanced study in fields including the traditional chemical specialties, as well as biochemistry, materials science, forensic science, medicine, education, law, and other endeavors that may draw upon an understanding of the chemical basis of the world around us.

Key general objectives are the development of qualitative and quantitative problem-solving skills and effective communication skills. Specific learning objectives for the chemistry major include to develop conceptual understanding and problem-solving abilities in the fundamental chemical subfields of analytical chemistry, biochemistry, inorganic chemistry, organic chemistry, and physical chemistry; gain a foundation of physics and mathematics and integrate these areas with chemical principles; perform quantitative measurements; synthesize and characterize compounds; learn proper laboratory practices including safety; develop proficiency with modern instruments and computers for data acquisition and analysis; and learn the relevance of chemistry to biology, pharmacology, medicine, manufactured and natural materials, and the environment.

Most of our chemistry majors participate in the cooperative education program and thereby gain invaluable professional experience to augment their classroom and laboratory work. Not only does that experience add immensely to the overall education received, it also provides contacts and references for later employment or graduate school admissions. Chemistry majors also undertake a research project for at least one semester under the supervision of a faculty member. Sufficient electives are available in the program either to take more advanced courses or research within the department, or to add courses in an area of special interest, such as criminal justice in the case of an interest in forensic science.

BS in Chemistry

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR NATURAL SCIENCE MAJORS
See page 41 for requirement list.

REQUIRED TECHNICAL COURSES FOR BS IN CHEMISTRY

Mathematics

Complete three courses:

MTH U151	Calculus and Differential Equations for Biology 1	4 SH
or MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U152	Calculus and Differential Equations for Biology 2	4 SH
or MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U345	Ordinary Differential Equations	4 SH

Biochemistry

Complete the following course:

BIO U323	Biochemistry	4 SH
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Physics

Complete two courses with corresponding labs:

PHY U161	Physics 1	5 SH
PHY U165	Physics 2	5 SH
or PHY U147	Physics for Life Sciences 2	5 SH

Advanced Science and Math Elective

Complete one course from one of the following departments:

BIO U500 to BIO U699
CHM U500 to CHM U699
GEO U500 to GEO U699
MTH U500 to MTH U699
PHY U500 to PHY U699

CHEMISTRY MAJOR REQUIREMENTS

General Chemistry

Complete the following two courses with corresponding labs:

CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH

Intermediate-Level Chemistry

Complete the following five courses:

CHM U311	Organic Chemistry 1	5 SH
CHM U313	Organic Chemistry 2	5 SH
CHM U321	Analytical Chemistry	5 SH
CHM U401	Physical Chemistry 1	5 SH
CHM U403	Physical Chemistry 2	5 SH

Advanced-Level Chemistry

Complete the following three courses with corresponding labs:

CHM U501	Inorganic Chemistry	4 SH
CHM U521	Instrumental Methods of Analysis	5 SH
CHM U531	Chemical Synthesis Characterization	5 SH

Senior Research

Complete the following course:

CHM U750	Senior Research	4 SH
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Chemistry Capstone

Complete the following course:

CHM U770	Chemistry Capstone	4 SH
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EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

CHEMISTRY MAJOR

Complete 83 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY- WIDE REQUIREMENTS

136 total semester hours required
Minimum 2.000 GPA required

Minor in Chemistry

REQUIRED COURSES

Complete the following six courses with corresponding labs:

CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH
CHM U311	Organic Chemistry 1	5 SH
CHM U313	Organic Chemistry 2	5 SH
CHM U401	Physical Chemistry 1	5 SH
CHM U403	Physical Chemistry 2	5 SH

Engineering students may take CHM U151 and one other CHM course in place of CHM U211 and CHM U214.

GPA REQUIREMENTS

2.000 GPA required in the minor

CINEMA STUDIES

INEZ HEDGES, PhD, *Professor, Modern Languages*
 KATHY HOWLETT, PhD, *Associate Professor, English*
Codirectors of the Program in Cinema Studies

PROFESSORS

Harlow Robinson, PhD, *Modern Languages*
 Constance Rose, PhD, *Modern Languages*
 Michael Ryan, PhD, *English*

ASSISTANT PROFESSORS

Gerald Herman, MA, *History*
 Harry Kuoshu, PhD, *Modern Languages*
 Rei Okamoto, PhD, *Modern Languages*
 Alan West-Duran, PhD, *Modern Languages*

LECTURERS

Michele Cao-Danh, PhD, *Modern Languages*
 Emily Fox Kales, PhD, *Interdisciplinary Studies*
 Louise McBryde, MA, *Interdisciplinary Studies*

The cinema studies curriculum is formulated upon a systematic historical, critical, and practice-oriented approach to the study of cinema. Students in the dual major are exposed to film as art, and become aware of the elements that comprise narrative film, such as editing, mise-en-scène, sound, and cinematography; explore different modes of cinematic narrative, in particular, the differences between Hollywood and art cinema; broaden their understanding of international cinema and become conscious of the characteristics of distinctive national cinemas, with an in-depth study of at least three different cinemas; and examine the productive interchange between film and the literary text. In many of the cinema studies offerings, students are encouraged to reflect upon the crucial role of film in the art movements of the twentieth century and to make connections between the classroom and practical experience in small-group discussions. A number of screenwriting and

production courses allow students to make practical applications of their analytical skills.

Students may enroll in the dual major in cinema studies in combination with the following other dual majors: communication studies, English, journalism, modern languages, and theatre.

Cooperative education placements (arranged through the student's other dual major program) and internships (arranged through cinema studies) demonstrate to students how the fundamental aspects of the cinema studies dual major—visual literacy, effective communication, collaborative teamwork, critical thinking, and analytical skills—are valuable in a variety of work settings. The cooperative education and/or internship experience assists cinema studies dual majors in assessing their short- and long-term goals in terms of undergraduate educational focus, graduate school preparation, and career aspirations. It helps students to understand their own values, ethics, and ideas in the context of the professions that they experience while on co-op/internship. Students' placements also serve to expose them to a variety of professional people who may serve as mentors in the present and future. The following types of organizations typically provide cinema studies dual majors with the best opportunities to develop research, writing, and visual communication skills, as well as analytical and critical skills relevant to their major(s): Web site development companies, documentary production companies, advertising agencies, Boston-based film units of commercial film productions, independent feature productions, WGBH, cable companies, film distributors, art houses, the Museum of Fine Arts film program, and area film festivals.

Students who choose the cinema studies minor learn to approach the film and television medium from a range of aesthetic, historical, international, and sociological perspectives. They may also learn to integrate these analytical approaches with practical experience in videography and the study of broadcast technology. The diverse course offerings and carefully structured program have enabled our graduates to do well in the ever-expanding world of video production, distribution, and marketing, as well as to pursue careers as film scholars and teachers.

BA in Cinema Studies and Communication Studies

COLLEGE OF ARTS AND SCIENCES BA CORE
 REQUIREMENTS FOR SPECIFIED PROGRAMS
 See page 41 for requirement list.

CINEMA REQUIREMENTS FOR CINEMA STUDIES DUAL MAJOR

See "Cinema Requirements for Cinema Studies Dual Major" on page 62.

COMMUNICATIONS REQUIREMENTS FOR CINEMA STUDIES DUAL MAJOR

Introductory Communications

Complete the following two courses:

CMN U101	Intro to Communication Studies	4 SH
CMN U220	Media, Culture, Society	4 SH

Communications Electives

Complete four courses from the following list:

CMN U310	Classical Age of Speech and Rhetoric	4 SH
CMN U321	Television: Text and Context	4 SH
CMN U421	Sports Broadcasting	4 SH
CMN U423	Foundations of Electronic Media	4 SH
CMN U620	Television Studio Production	4 SH
CMN U910	Special Topics in Public Communication	4 SH
CMN U912	Special Topics in Media Studies	4 SH
CMN U914	Special Topics: Organizational Communication	4 SH

Production

Complete the following three courses:

CMN U420	Audio Production	4 SH
CMN U520	TV Field Production	4 SH
CMN U620	Television Studio Production	4 SH

Senior Seminar

Complete the following course:

CMN U901	Senior Seminar in Communications	4 SH
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CINEMA STUDIES AND COMMUNICATIONS

Complete 80 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Cinema Studies and English

COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS FOR SPECIFIED PROGRAMS

See page 41 for requirement list.

CINEMA REQUIREMENTS FOR CINEMA STUDIES

DUAL MAJOR

See "Cinema Requirements for Cinema Studies Dual Major" on page 62.

ENGLISH REQUIREMENTS FOR CINEMA STUDIES

DUAL MAJOR

Literature Backgrounds

Complete the following course:

ENG U226	Backgrounds in English and American Literature	4 SH
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Literature Survey

Complete any three of the following courses:

ENG U220	Survey of English Literature 1	4 SH
ENG U221	Survey of English Literature 2	4 SH
ENG U223	Survey of American Literature 1	4 SH
ENG U224	Survey of American Literature 2	4 SH

Shakespeare

Complete one Shakespeare course:

ENG U489	Shakespeare on Film	4 SH
ENG U611	Shakespeare	4 SH
ENG U612	Shakespeare's Comedies	4 SH
ENG U613	Shakespeare's Tragedies	4 SH
ENG U614	Topics in Shakespeare	4 SH

Period Courses

Complete two courses from two different century groups:

ELEVENTH TO FIFTEENTH CENTURY		
ENG U605	Medieval English Literature	4 SH
ENG U606	Topics in Medieval Literature	4 SH

SIXTEENTH CENTURY		
ENG U610	Sixteenth-Century English Literature	4 SH

SEVENTEENTH CENTURY		
ENG U617	Seventeenth-Century English Literature	4 SH

EIGHTEENTH CENTURY		
ENG U619	Eighteenth-Century English Literature	4 SH
ENG U620	Topics in Eighteenth-Century English Literature	4 SH

ENG U661	Early American Literature	4 SH
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NINETEENTH CENTURY		
ENG U519	American Novels 1	4 SH
ENG U621	Romantic Poetry	4 SH
ENG U624	Victorian Literature	4 SH
ENG U626	Nineteenth-Century British Fiction	4 SH
ENG U663	Early African-American Literature	4 SH
ENG U665	The American Renaissance	4 SH
ENG U667	American Realism	4 SH

TWENTIETH CENTURY		
ENG U394	Modern Film	4 SH
ENG U408	The Modern Bestseller	4 SH
ENG U409	The Modern Novel	4 SH
ENG U410	Modern Drama	4 SH
ENG U411	The Modern Short Story	4 SH
ENG U412	Contemporary Fiction	4 SH
ENG U520	American Novels 2	4 SH
ENG U630	Major Twentieth-Century British Novelists	4 SH
ENG U631	Twentieth-Century English Literature	4 SH
ENG U668	Modern American Literature	4 SH
ENG U670	Modern African-American Literature	4 SH
ENG U671	Multiethnic Literature of the U.S.	4 SH
ENG U672	Asian-American Literature	4 SH
ENG U673	U.S. Latino/Latina Literature	4 SH
ENG U674	American Indian Literature	4 SH
ENG U676	Contemporary American Literature	4 SH
ENG U687	Modern Poetry	4 SH
ENG U688	Contemporary Poetry	4 SH

Literary Criticism, Linguistics, or Rhetoric

Complete one course from the following list:

CRITICISM		
ENG U337	Literary Interpretation	4 SH
ENG U339	Topics in Literary Criticism	4 SH

LINGUISTICS

ENG U150	Introduction to Language and Linguistics	4 SH
ENG U350	Linguistic Analysis	4 SH
ENG U450	Syntax	4 SH
ENG U452	Semantics	4 SH
ENG U454	History of English	4 SH
ENG U456	Language and Gender	4 SH
ENG U458	Topics in Linguistics	4 SH

RHETORIC

ENG U322	Topics in Rhetoric	4 SH
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English Elective

Choose two English courses that are not part of the BA core writing requirements, and excluding:

ENG U165, ENG U166, ENG U167.

SENIOR SEMINAR

Complete the following course:

ENG U710	Junior/Senior Seminar	4 SH
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EXPERIENTIAL EDUCATION

Complete one course from the following list, or complete a program of study abroad.

ENG U381	The Writing Process	4 SH
ENG U382	Publication Arts	4 SH
ENG U694	Topics in Experiential Education	4 SH
ENG U940	Internship Practicum	4 SH

CINEMA STUDIES AND ENGLISH

Complete 76 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Cinema Studies and Journalism

COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS FOR SPECIFIED PROGRAMS

See page 41 for requirement list.

CINEMA REQUIREMENTS FOR CINEMA STUDIES

DUAL MAJOR

See "Cinema Requirements for Cinema Studies Dual Major" on page 62.

JOURNALISM REQUIREMENTS FOR CINEMA STUDIES

DUAL MAJOR

Journalism Foundations

Complete the following four courses:

JRN U101	Journalism 1	4 SH
JRN U150	Interpreting the Day's News	4 SH
JRN U201	Journalism 2	4 SH
JRN U301	Journalism 3	4 SH

Television News

Complete the following two courses:

JRN U511	Television News Writing	4 SH
JRN U512	Television News Production 1	4 SH

Documentary Production

Complete the following course:

JRN U609	Documentary Production	4 SH
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Ethics and Issues

Complete the following course:

JRN U650	Journalism Ethics and Issues	4 SH
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Journalism Elective

Choose one course from the journalism department.

Experiential Education

Experiential education is satisfied by

JRN U650	Journalism Ethics and Issues	4 SH
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and one studio production course:

CMN U420	Audio Production	4 SH
CMN U520	TV Field Production	4 SH
CMN U620	Television Studio Production	4 SH

CINEMA STUDIES AND JOURNALISM

Complete 76 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Cinema Studies and Modern Languages

COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS FOR SPECIFIED PROGRAMS

See page 41 for requirement list.

CINEMA REQUIREMENTS FOR CINEMA STUDIES

DUAL MAJOR

See "Cinema Requirements for Cinema Studies Dual Major" on page 62.

LANGUAGE REQUIREMENTS FOR CINEMA STUDIES

DUAL MAJOR

Language Requirements

Complete the following three courses in the appropriate language.

FRENCH

LNF U301	French Conversation and Composition 1	4 SH
LNF U302	French Conversation and Composition 2	4 SH
LNF U501	Advanced French	4 SH

SPANISH

LNS U301	Spanish Conversation and Composition 1	4 SH
LNS U302	Spanish Conversation and Composition 2	4 SH
LNS U501	Advanced Spanish	4 SH

Literature

Complete one literature course in the appropriate language from the following list.

FRENCH

- LNF U550 Masterpieces of French Literature 1 4 SH
- LNF U551 Masterpieces of French Literature 2 4 SH

SPANISH

- LNS U550 Masterpieces of Spanish Literature Twelfth to Seventeenth Century 4 SH
- LNS U551 Masterpieces of Spanish Literature Eighteenth to Twentieth Century 4 SH

Advanced Language

Complete one course in the appropriate language above the 400 level.

FRENCH

- LNF U400 to LNF U699

SPANISH

- LNS U400 to LNS U699

Study Abroad

Complete four courses in your major while on study abroad.

Experiential Education

Experiential education is satisfied by study abroad.

CINEMA STUDIES AND MODERN LANGUAGES

Complete 76 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required
Minimum 2.000 GPA required

BA in Cinema Studies and Theatre

COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS FOR SPECIFIED PROGRAMS

See page 41 for requirement list.

CINEMA REQUIREMENTS FOR CINEMA STUDIES

DUAL MAJOR

See "Cinema Requirements for Cinema Studies Dual Major" on page 62.

THEATRE REQUIREMENTS FOR CINEMA STUDIES

DUAL MAJOR

Theatre Introduction

Complete the following three courses:

- THE U101 Theatre Arts 4 SH
- THE U120 Acting 1 4 SH
- THE U131 Technical Theatre 1 4 SH

History and Theory

Complete the following two courses:

- THE U300 Theatre History 4 SH
- THE U500 Dramatic Theory/Criticism 4 SH

Onstage

Complete the following three courses:

- THE U325 Script Analysis for the Stage 4 SH
- THE U342 Acting 2 4 SH
- THE U550 Concepts of Directing 4 SH

Backstage

Complete the following course:

- THE U270 Theatrical Design 4 SH

Practicum/Experiential Education

Complete the three theatre practicums and the theatre capstone.

PRACTICUM

- THE U901 Theatre Practicum 1 1 SH
- THE U902 Theatre Practicum 2 1 SH
- THE U903 Theatre Practicum 3 1 SH

CAPSTONE

- THE U701 Rehearsal and Performance 4 SH

CINEMA STUDIES AND THEATRE

Complete 82 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required
Minimum 2.000 GPA required

BS in Cinema Studies and Theatre

COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR ARTS/HUMANITIES MAJORS

See page 41 for requirement list.

CINEMA REQUIREMENTS FOR CINEMA STUDIES

DUAL MAJOR

See "Cinema Requirements for Cinema Studies Dual Major" on page 62.

THEATRE REQUIREMENTS FOR CINEMA STUDIES

DUAL MAJOR

Theatre Introduction

Complete the following three courses:

- THE U101 Theatre Arts 4 SH
- THE U120 Acting 1 4 SH
- THE U131 Technical Theatre 1 4 SH

History and Theory

Complete the following two courses:

- THE U300 Theatre History 4 SH
- THE U500 Dramatic Theory/Criticism 4 SH

Onstage

Complete the following three courses:

THE U325	Script Analysis for the Stage	4 SH
THE U342	Acting 2	4 SH
THE U550	Concepts of Directing	4 SH

Backstage

Complete the following course:

THE U270	Theatrical Design	4 SH
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Practicum/Experiential Education

Complete the three theatre practicums and the theatre capstone.

PRACTICUM

THE U901	Theatre Practicum 1	1 SH
THE U902	Theatre Practicum 2	1 SH
THE U903	Theatre Practicum 3	1 SH

CAPSTONE

THE U701	Rehearsal and Performance	4 SH
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CINEMA STUDIES AND THEATRE

Complete 82 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

**Cinema Studies Requirements for Cinema Studies
Dual Majors**

REQUIRED COURSES

Complete the following three courses:

CIN U150	Film Analysis	4 SH
CIN U350	Film Theory	4 SH
CIN U500	Modernism/Modernity and Film	4 SH
or CIN U550	Cinema Studies Seminar	4 SH

INTERNATIONAL CINEMA

Choose three courses from the following list:

CIN U240	Latin American Film	4 SH
CIN U250	Australian Film	4 SH
CIN U255	Chinese Film: Gender and Ethnicity	4 SH
CIN U260	Japanese Film	4 SH
CIN U265	Spanish Civil War on Film	4 SH
CIN U270	Modern German Film and Literature	4 SH
CIN U280	French Film and Culture	4 SH
CIN U386	History of Soviet Cinema	4 SH
CIN U460	Jewish Film	4 SH

INTEGRATIVE FILM AND LITERATURE

Complete one course from the following list:

CIN U391	Topics in Film	4 SH
CIN U488	Film and Text	4 SH
CIN U489	Shakespeare on Film	4 SH

CINEMA STUDIES ELECTIVES

Choose two cinema studies courses.

EXPERIENTIAL EDUCATION FOR CINEMA

Complete 4 semester hours from the following list:

CIN U446	Topics in Documentary Production	4 SH
CIN U650	Page to Screen	4 SH
CIN U941	Cinema Studies Internship	1 SH
CIN U942	Cinema Studies Internship	2 SH
CIN U943	Cinema Studies Internship	3 SH
CIN U944	Cinema Studies Internship	4 SH
CIN U945	Cinema Studies Practicum	1 SH
CIN U946	Cinema Studies Practicum	1 SH
CIN U947	Cinema Studies Practicum	2 SH
CIN U948	Cinema Studies Practicum	2 SH
CIN U949	Cinema Studies Practicum	3 SH

Minor in Cinema Studies**REQUIRED COURSES**

Complete two courses:

CIN U120	Exploring the Humanities through Film	4 SH
or CIN U150	Film Analysis	4 SH
CIN U350	Film Theory	4 SH

EXPERIENTIAL LEARNING

Complete 4 semester hours from the following list:

CIN U446	Topics in Documentary Production	4 SH
CIN U650	Page to Screen	4 SH
CIN U921	Directed Study	1 SH
CIN U922	Directed Study	2 SH
CIN U923	Directed Study	3 SH
CIN U924	Directed Study	4 SH
CIN U945	Cinema Studies Practicum	1 SH
CIN U946	Cinema Studies Practicum	1 SH
CIN U947	Cinema Studies Practicum	2 SH
CIN U948	Cinema Studies Practicum	2 SH
CIN U949	Cinema Studies Practicum	3 SH

ELECTIVE COURSES

Choose three cinema studies courses (not already taken).

GPA REQUIREMENTS

2.000 GPA required in the minor

For more information on the cinema studies minor, contact the codirectors of cinema studies, Professor Inez Hedges (429 Meserve) and Professor Kathy Howlett (427 Holmes), at 617.373.3654 and 617.373.4554, respectively.

COMMUNICATION STUDIES

P. DAVID MARSHALL, PHD
Associate Professor and Chair

PROFESSOR

Richard Katula, PhD

ASSOCIATE PROFESSORS

Joanne Morreale, PhD
Michael L. Woodnick, MS
Alan J. Zaremba, PhD

ASSISTANT PROFESSORS

Walter J. Carl, PhD
Elise Dallimore, PhD
Murray Forman, PhD
Alison Hearn, PhD
Carey Noland, PhD

The Department of Communication Studies is dedicated to providing a liberal arts education where critical skills, concepts, and thinking are developed in conjunction with practice and application. Through a study of processes, patterns, and media of communication, the degree in communication studies from Northeastern University provides the enriching background to allow our students to contribute significantly to the communication sector, whether that contribution is within organizations or in the media industries themselves. Through its students and faculty, communication studies at Northeastern is a program dedicated to critical innovation. It strives to integrate new research into teaching and pedagogy to ensure students are connected to new developments in the field of communication.

Students who wish to transfer to the communication studies major must meet the department's criteria for acceptance. In addition, space in this program is limited, so students may be admitted on a space-available basis. See pages 243–246 for course descriptions.

BA in Communication Studies

COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS

See page 40 for requirement list.

COMMUNICATION STUDIES MAJOR REQUIREMENTS

Complete the following five courses:

CMN U101	Intro to Communication Studies	4 SH
CMN U112	Public Speaking	4 SH
CMN U220	Media, Culture, Society	4 SH
CMN U231	Principles of Organizational Communication	4 SH
CMN U301	Methods and Research in Communication	4 SH

COMMUNICATION STUDIES CONCENTRATION

Select one of the three concentrations below.

Public Communication Concentration

REQUIRED COURSES

Complete the following two courses:

CMN U310	Classical Age of Speech and Rhetoric	4 SH
CMN U410	Rhetorical Theory and Criticism	4 SH

PUBLIC COMMUNICATION ELECTIVES

Choose three courses from the following list:

CMN U230	Interpersonal Communication	4 SH
CMN U302	Advertising and Promotional Culture	4 SH
CMN U303	Global and Intercultural Communication	4 SH
CMN U304	Communication and Gender	4 SH
CMN U311	Argumentation and Debate	4 SH
CMN U312	Voice and Articulation	4 SH
CMN U401	Advertising Principles and Practices	4 SH
CMN U402	Presentation, Style, and Professional Communication	4 SH
CMN U510	Persuasion in Contemporary Culture	4 SH
CMN U511	Oral Interpretation of Literature	4 SH
CMN U601	Discourse Analysis	4 SH
CMN U610	Political Communication	4 SH
CMN U631	Crisis Communication and Image Management	4 SH

Media Studies Concentration

REQUIRED COURSE

Complete the following course:

CMN U320	Theories of Media and Culture	4 SH
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MEDIA STUDIES ELECTIVES

Choose four courses from the following list (any production courses must be taken in sequence):

CMN U302	Advertising and Promotional Culture	4 SH
CMN U303	Global and Intercultural Communication	4 SH
CMN U304	Communication and Gender	4 SH
CMN U321	Television: Text and Context	4 SH
CMN U322	Popular Music as Media Form	4 SH
CMN U401	Advertising Principles and Practices	4 SH
CMN U421	Sports Broadcasting	4 SH
CMN U422	Media Audiences	4 SH
CMN U423	Foundations of Electronic Media	4 SH
CMN U424	Broadcasting Management and Programming	4 SH
CMN U622	New Media Culture	4 SH

PRODUCTION

CMN U420	Audio Production	4 SH
CMN U520	TV Field Production	4 SH
CMN U620	Television Studio Production	4 SH
CMN U621	Digital Editing for TV	4 SH

Organizational Communication Concentration

REQUIRED COURSES

Complete the courses in the following order.

COURSE ONE

Complete the following course:

CMN U531	Advanced Organizational Communication	4 SH
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COURSE TWO

Choose one course from the following list:

CMN U532	Theories of Conflict and Negotiation	4 SH
CMN U533	Consultation Skills	4 SH
CMN U630	Assessment Technique and Planning	4 SH

COURSE THREE

Complete the following course:

CMN U631	Crisis Communication and Image Management	4 SH
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ORGANIZATIONAL COMMUNICATION ELECTIVES

Choose two courses from the following list:

CMN U230	Interpersonal Communication	4 SH
CMN U303	Global and Intercultural Communication	4 SH
CMN U304	Communication and Gender	4 SH
CMN U401	Advertising Principles and Practices	4 SH
CMN U402	Presentation, Style, and Professional Communication	4 SH
CMN U530	Communication and Quality of Life	4 SH
CMN U534	Group Communication	4 SH

COMMUNICATIONS STUDIES MAJOR ELECTIVES

Choose three courses from any concentration or from the following list:

CMN U901	Senior Seminar in Communications	4 SH
CMN U910	Special Topics in Public Communication	4 SH
CMN U912	Special Topics in Media Studies	4 SH
CMN U914	Special Topics: Organizational Communication	4 SH
CMN U916	Organizational Communication Practicum	4 SH
CMN U924	Directed Study	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education:

CMN U944	Internship in Communication	4 SH
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COMMUNICATIONS MAJOR

Complete 52 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required
Minimum 2.000 GPA required

BA in Cinema Studies and Communication Studies

See page 58.

Minor in Communication Studies**REQUIRED COURSES**

Complete the following four courses:

CMN U101	Intro to Communication Studies	4 SH
CMN U112	Public Speaking	4 SH

CMN U220	Media, Culture, Society	4 SH
CMN U231	Principles of Organizational Communication	4 SH

ELECTIVE COURSES

Choose three courses from the following list:

CMN U230 to CMN U699
CMN U910 to CMN U914

GPA REQUIREMENTS

2.000 GPA required in the minor

ECONOMICS

STEVEN A. MORRISON, PhD

Professor and Chair

PROFESSORS

M. Shahid Alam, PhD
Daryl A. Hellman, PhD
Sungwoo Kim, PhD
John E. Kwoka Jr., PhD
Andrew M. Sum, MA

ASSOCIATE PROFESSORS

Neil O. Alper, PhD
Oscar T. Brookins, PhD
Kamran M. Dadkhah, PhD
Alan W. Dyer, PhD
Gregory H. Wassall, PhD

ASSISTANT PROFESSORS

Helen C. Connolly, PhD
Maria José Luengo-Prado, PhD
Dave N. Norris, PhD

Economics is the study of how societies produce and exchange goods and services to satisfy material needs. Economists analyze the process of economic growth and identify policies that contribute to economic stability and progress.

In the economics program, students examine the sources of economic growth—how societies produce more of what they need. Undergraduates study economics as part of a broad interest in the social sciences to develop specialized skills useful in today's complex labor market. The major in economics is a good foundation for graduate studies in advanced economics, public policy, law, or business.

Macroeconomics, which focuses on the overall economy, deals with such problems as inflation, unemployment, growth and instability, economic development, and governmental monetary and fiscal policies.

Microeconomics examines the economic behavior of individuals, households, firms, industries, and trade among countries. It seeks to assess the economic effects of market power and environmental damage and analyzes the economic aspects

of natural resources, poverty, health, income distribution, trade unions, and government regulation.

Courses in economics cover international trade; the behavior of families, firms, and industries in the market economy; the environmental costs of growth; and the economic aspects of natural resources, poverty, health, labor market discrimination affecting women and minorities, trade unions, and governmental oversight. International and comparative perspectives are emphasized, most directly in courses in economic development of the developing world and economic history.

Graduates may find jobs in federal, state, and local governments, major corporations, or financial institutions. Their work may involve planning and forecasting, assessing labor needs, and making financial studies. They may estimate consumer demand for new products, conduct research, teach, or provide specialized consulting services. See pages 257–260 for course descriptions.

BA in Economics

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

BREADTH COURSES FOR ECONOMICS MAJOR

Complete one calculus and one computer science course.

CALCULUS

MTH U131 Calculus for Business and Economics 4 SH

COMPUTER SCIENCE

MIS U301 Management Information Systems 4 SH

or CS U101 Computer Science and Its Applications 4 SH

ECONOMICS MAJOR REQUIREMENTS

FOR BA STUDENTS

Required Economics Courses

Complete the following six courses:

ECN U115 Principles of Macroeconomics 4 SH

ECN U116 Principles of Microeconomics 4 SH

ECN U315 Macroeconomic Theory 4 SH

ECN U316 Microeconomic Theory 4 SH

ECN U350 Statistics 4 SH

ECN U520 History of Economic Thought 4 SH

Senior Seminar

Complete the following seminar for seniors:

ECN U692 Senior Economics Seminar 4 SH

ECONOMICS ELECTIVES FOR BA STUDENTS

ECONOMICS ELECTIVES

Complete five courses in economics with no more than one at the introductory level.

ECN U200 to ECN U699

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ECONOMICS MAJOR

Complete 56 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Economics

COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR SOCIAL SCIENCE MAJORS
See page 42 for requirement list.

BREADTH COURSES FOR ECONOMICS MAJOR

Complete one calculus and one computer science course.

CALCULUS

MTH U131 Calculus for Business and Economics 4 SH

COMPUTER SCIENCE

MIS U301 Management Information Systems 4 SH

or CS U101 Computer Science and Its Applications 4 SH

ECONOMICS MAJOR REQUIREMENTS

FOR BS STUDENTS

Required Economics Courses

Complete the following six courses:

ECN U115 Principles of Macroeconomics 4 SH

ECN U116 Principles of Microeconomics 4 SH

ECN U315 Macroeconomic Theory 4 SH

ECN U316 Microeconomic Theory 4 SH

ECN U350 Statistics 4 SH

ECN U560 Applied Econometrics 4 SH

Senior Seminar

Complete the following course:

ECN U692 Senior Economics Seminar 4 SH

ELECTIVES FOR BS IN ECONOMICS

Complete seven economics electives with no more than two at the introductory level and at least five at the intermediate level or above:

ECN U200 to ECN U699

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education.

Please see department for approved courses.

ECONOMICS MAJOR

Complete 64 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Economics

REQUIRED COURSES

Complete the following three courses (macro track take ECN U315):

ECN U115	Principles of Macroeconomics	4 SH
ECN U116	Principles of Microeconomics	4 SH
ECN U315	Macroeconomic Theory	4 SH
or ECN U316	Microeconomic Theory	4 SH

ELECTIVE COURSES

Choose three economics electives.

GPA REQUIREMENTS

2.000 GPA required in the minor

EDUCATION

JAMES W. FRASER, PHD

Professor and Dean

THOMAS GILBERT, PHD

Associate Director for Academic Affairs

PROFESSORS

Maurice Gilmore, PhD

Richard Katula, PhD

Kathleen Kelly, PhD

Mervin D. Lynch, PhD

Patrick Manning, PhD

Emanuel J. Mason, PhD

John Portz, PhD

ASSOCIATE PROFESSORS

Kostia Bergman, PhD

Charmarie Jenkins Blaisdell, PhD

Holly M. Carter, PhD

Robert W. Case, PhD

Joan Fitzgerald, PhD

Robert Fried, EdD

Karin Lifter, PhD

William Lowe, PhD

Peter C. Murrell, PhD

Carla Oblas, MA

Donna M. Qualters, PhD

Gordana Rabrenovic, PhD

Susan Wall, PhD

ASSISTANT PROFESSORS

Gerald H. Herman, MA

Nelson Rodriguez, PhD

Blidi Stemm, PhD

PROFESSORS EMERITI

Nicholas J. Buffone, PhD

Leslie A. Burg, EdD

John D. Herzog, PhD

Maurice Kaufman, PhD

Joseph Meier, EdD

Irene A. Nichols, EdD

Sandra M. Parker, EdD

Barbara A. Schram, EdD

The Northeastern University School of Education is based on a student-centered, urban-focused, and practice-oriented program of development for future educators. Becoming a capable teacher-scholar entails mastering key abilities necessary for effective practice and for the exercise of professional values. In accord with the Massachusetts competencies, the Interstate New Teacher Assessment and Support Consortium (INTASC) national standards for beginning practice, and the National Board of Professional Teaching Standards (NBPTS) national standards for accomplished practice, the School of Education has developed five professional competencies prospective teachers must master. The teacher preparation program assists the development of teacher candidates toward five advanced performance standards: (1) conceptualization; (2) diagnosis; (3) communication; (4) coordination; and (5) ethical praxis. These performance standards define the outcomes expected of candidates completing the program and specify the necessary integration of knowledge, professional skill, and professional disposition that defines the well-prepared teacher. Students achieve these performance standards through a combination of field experience and course work.

Students seeking admission to any of the programs within the School of Education first enroll in ED U111, Education and the Community, where they will encounter a range of concepts, issues, and urban field experiences that will help them consider the challenges and rewards of careers in education. During the sophomore year or after completion of Education and the Community, students apply for admission. (See *Admissions Guideline* available at the School of Education.) The programs in the School of Education prepare students to obtain Massachusetts teacher licensure. All students who seek teaching licenses need degrees that consist of a major in arts and sciences and a program of study in education. The required courses in the programs of study are listed below.

Note: The School of Education's programs are being revised and expanded. The regulations in the Commonwealth of Massachusetts have been changed and will impact students seeking licensure. For arts and sciences major program requirements, refer to the appropriate major section in this catalog. See pages 260–263 for course descriptions.

Note: See Appendix, page 425, for the School of Education's Title II Report Card.

ENGLISH

MARY LOEFFELHOLZ, PhD
Associate Professor and Chair

PROFESSORS

Samuel J. Bernstein, PhD
Francis C. Blessington, PhD
Wayne Franklin, PhD
Gary Goshgarian, PhD
Kathleen Kelly, PhD
Stuart S. Peterfreund, PhD
Guy Rotella, PhD
Michael Ryan, PhD

ASSOCIATE PROFESSORS

Elizabeth C. Britt, PhD
Kathy Howlett, PhD
Marina Leslie, PhD
Janet Randall, PhD
Bonnie TuSmith, PhD
Susan Wall, PhD

ASSISTANT PROFESSORS

Laura Green, PhD
Cassandra V. Jackson, PhD
Elizabeth Shea, PhD

LECTURERS

Joseph B. deRoche, MFA
David W. Tutein, MA

ACADEMIC SPECIALISTS

Kalo Clarke, MFA
Matthew P. Noonan, MFA

The department offers courses in American and British literature; creative, expository, and technical writing; linguistics; and literary studies.

Students who have completed the freshman English requirement and are in good academic standing may major or minor in English. The broad-based major requires proficiency in a number of approaches—including historical, generic, and theoretical—to the study of language and literature. The more narrowly focused minor gives students intensive exposure to literature, writing, linguistics, or technical communication.

English majors prepare for careers in teaching and research, advertising and publishing, radio and television—any field in which communication and critical judgment go hand in hand. The department also offers an intellectual and cultural framework for preprofessional students in law, medicine, business, engineering, or computer science. See pages 266–274 for course descriptions.

BA in English

COLLEGE OF ARTS AND SCIENCES
BA CORE REQUIREMENTS
See page 40 for requirement list.

ENGLISH MAJOR REQUIREMENTS

Literature Backgrounds

Complete the following course:

ENG U226 Backgrounds in English and American Literature 4 SH

Literature Survey

Complete three courses from the following list:

ENG U220 Survey of English Literature 1 4 SH
ENG U221 Survey of English Literature 2 4 SH
ENG U223 Survey of American Literature 1 4 SH
ENG U224 Survey of American Literature 2 4 SH

Capstone Seminar

Complete one of the following courses:

ENG U654 Seminar in Linguistics 4 SH
ENG U710 Junior/Senior Seminar 4 SH

ENGLISH MAJOR ELECTIVES

Shakespeare

Complete one course from the following list:

ENG U489 Shakespeare on Film 4 SH
ENG U611 Shakespeare 4 SH
ENG U612 Shakespeare's Comedies 4 SH
ENG U613 Shakespeare's Tragedies 4 SH
ENG U614 Topics in Shakespeare 4 SH

Major Figure Requirement

Complete one course from the following list:

ENG U600 Major Figure 4 SH
ENG U607 Chaucer 4 SH
ENG U608 Topics in Chaucer 4 SH
ENG U618 Milton 4 SH

Literary Periods

Complete one course from three different century groups:

LITERATURE FROM ELEVENTH TO FIFTEENTH CENTURIES

ENG U605 Medieval English Literature 4 SH
ENG U606 Topics in Medieval Literature 4 SH

LITERATURE IN THE SIXTEENTH CENTURY

ENG U610 Sixteenth-Century English Literature 4 SH

LITERATURE IN THE SEVENTEENTH CENTURY

ENG U617 Seventeenth-Century English Literature 4 SH

LITERATURE IN THE EIGHTEENTH CENTURY

ENG U619 Eighteenth-Century English Literature 4 SH
ENG U620 Topics in Eighteenth-Century English Literature 4 SH

ENG U661 Early American Literature 4 SH

LITERATURE IN THE NINETEENTH CENTURY

ENG U519 American Novels 1 4 SH
ENG U621 Romantic Poetry 4 SH
ENG U624 Victorian Literature 4 SH

ENG U625	Topics in Victorian Literature	4 SH
ENG U626	Nineteenth-Century British Fiction	4 SH
ENG U663	Early African-American Literature	4 SH
ENG U665	The American Renaissance	4 SH
ENG U667	American Realism	4 SH

LITERATURE IN THE TWENTIETH CENTURY

ENG U394	Modern Film	4 SH
ENG U408	The Modern Bestseller	4 SH
ENG U409	The Modern Novel	4 SH
ENG U410	Modern Drama	4 SH
ENG U411	The Modern Short Story	4 SH
ENG U412	Contemporary Fiction	4 SH
ENG U520	American Novels 2	4 SH
ENG U630	Major Twentieth-Century British Novelists	4 SH
ENG U631	Twentieth-Century English Literature	4 SH
ENG U668	Modern American Literature	4 SH
ENG U670	Modern African-American Literature	4 SH
ENG U671	Multiethnic Literature of the U.S.	4 SH
ENG U672	Asian-American Literature	4 SH
ENG U673	U.S. Latino/Latina Literature	4 SH
ENG U674	American Indian Literature	4 SH
ENG U676	Contemporary American Literature	4 SH
ENG U687	Modern Poetry	4 SH
ENG U688	Contemporary Poetry	4 SH

Literary Criticism, Linguistics, or Rhetoric

Complete one course from any of the categories below.

CRITICISM

ENG U337	Literary Interpretation	4 SH
ENG U339	Topics in Literary Criticism	4 SH

LINGUISTICS

ENG U150	Introduction to Language and Linguistics	4 SH
ENG U350	Linguistic Analysis	4 SH
ENG U450	Syntax	4 SH
ENG U452	Semantics	4 SH
ENG U454	History of English	4 SH
ENG U456	Language and Gender	4 SH
ENG U458	Topics in Linguistics	4 SH

RHETORIC

ENG U322	Topics in Rhetoric	4 SH
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English Electives

Choose two English courses that are not part of the BA core writing requirements.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ENGLISH MAJOR

Complete 56 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in English**COLLEGE OF ARTS AND SCIENCES BS CORE****REQUIREMENTS FOR ARTS/HUMANITIES MAJORS**

See page 41 for requirement list.

ENGLISH MAJOR REQUIREMENTS*Literature Backgrounds*

Complete the following course:

ENG U226	Backgrounds in English and American Literature	4 SH
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Literature Survey

Complete three courses from the following list:

ENG U220	Survey of English Literature 1	4 SH
ENG U221	Survey of English Literature 2	4 SH
ENG U223	Survey of American Literature 1	4 SH
ENG U224	Survey of American Literature 2	4 SH

Capstone Seminar

Complete one of the following courses:

ENG U654	Seminar in Linguistics	4 SH
ENG U710	Junior/Senior Seminar	4 SH

ENGLISH MAJOR ELECTIVES*Shakespeare*

Complete one course from the following list:

ENG U489	Shakespeare on Film	4 SH
ENG U611	Shakespeare	4 SH
ENG U612	Shakespeare's Comedies	4 SH
ENG U613	Shakespeare's Tragedies	4 SH
ENG U614	Topics in Shakespeare	4 SH

Major Figure Requirement

Complete one course from the following list:

ENG U600	Major Figure	4 SH
ENG U607	Chaucer	4 SH
ENG U608	Topics in Chaucer	4 SH
ENG U618	Milton	4 SH

Literary Periods

Complete one course from three different century groups.

LITERATURE FROM ELEVENTH TO FIFTEENTH CENTURIES

ENG U605	Medieval English Literature	4 SH
ENG U606	Topics in Medieval Literature	4 SH

LITERATURE IN THE SIXTEENTH CENTURY

ENG U610	Sixteenth-Century English Literature	4 SH
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LITERATURE IN THE SEVENTEENTH CENTURY

ENG U617	Seventeenth-Century English Literature	4 SH
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LITERATURE IN THE EIGHTEENTH CENTURY

ENG U619	Eighteenth-Century English Literature	4 SH
ENG U620	Topics in Eighteenth-Century English Literature	4 SH
ENG U661	Early American Literature	4 SH

LITERATURE IN THE NINETEENTH CENTURY

ENG U519	American Novels 1	4 SH
ENG U621	Romantic Poetry	4 SH
ENG U624	Victorian Literature	4 SH
ENG U625	Topics in Victorian Literature	4 SH
ENG U626	Nineteenth-Century British Fiction	4 SH
ENG U663	Early African-American Literature	4 SH
ENG U665	The American Renaissance	4 SH
ENG U667	American Realism	4 SH

LITERATURE IN THE TWENTIETH CENTURY

ENG U394	Modern Film	4 SH
ENG U408	The Modern Bestseller	4 SH
ENG U409	The Modern Novel	4 SH
ENG U410	Modern Drama	4 SH
ENG U411	The Modern Short Story	4 SH
ENG U412	Contemporary Fiction	4 SH
ENG U520	American Novels 2	4 SH
ENG U630	Major Twentieth-Century British Novelists	4 SH
ENG U631	Twentieth-Century English Literature	4 SH
ENG U668	Modern American Literature	4 SH
ENG U670	Modern African-American Literature	4 SH
ENG U671	Multiethnic Literature of the U.S.	4 SH
ENG U672	Asian-American Literature	4 SH
ENG U673	U.S. Latino/Latina Literature	4 SH
ENG U674	American Indian Literature	4 SH
ENG U676	Contemporary American Literature	4 SH
ENG U687	Modern Poetry	4 SH
ENG U688	Contemporary Poetry	4 SH

Literary Criticism, Linguistics, or Rhetoric

Complete one course from any of the categories below.

CRITICISM

ENG U337	Literary Interpretation	4 SH
ENG U339	Topics in Literary Criticism	4 SH

LINGUISTICS

ENG U150	Introduction to Language and Linguistics	4 SH
ENG U350	Linguistic Analysis	4 SH
ENG U450	Syntax	4 SH
ENG U452	Semantics	4 SH
ENG U454	History of English	4 SH
ENG U456	Language and Gender	4 SH
ENG U458	Topics in Linguistics	4 SH

RHETORIC

ENG U322	Topics in Rhetoric	4 SH
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English Electives

Choose two English courses that are not part of the BA core writing requirements.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ENGLISH MAJOR

Complete 56 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Cinema Studies and English

See page 59.

BA in Linguistics and English

See page 83.

Minor in Literature**ENGLISH SURVEY COURSE**

Choose one course from the following list:

ENG U220	Survey of English Literature 1	4 SH
ENG U221	Survey of English Literature 2	4 SH
ENG U223	Survey of American Literature 1	4 SH
ENG U224	Survey of American Literature 2	4 SH

BACKGROUNDS OR SHAKESPEARE

Choose one course from the following list:

ENG U226	Backgrounds in English and American Literature	4 SH
ENG U489	Shakespeare on Film	4 SH
ENG U611	Shakespeare	4 SH
ENG U612	Shakespeare's Comedies	4 SH
ENG U613	Shakespeare's Tragedies	4 SH
ENG U614	Topics in Shakespeare	4 SH

LITERARY CRITICISM, LINGUISTICS, OR RHETORIC

Choose one course from the following list:

ENG U150	Introduction to Language and Linguistics	4 SH
ENG U322	Topics in Rhetoric	4 SH
ENG U337	Literary Interpretation	4 SH
ENG U339	Topics in Literary Criticism	4 SH
ENG U350	Linguistic Analysis	4 SH
ENG U458	Topics in Linguistics	4 SH
ENG U654	Seminar in Linguistics	4 SH
ENG U656	Seminar in Linguistics	4 SH

LITERATURE ELECTIVE

Choose one course from the Department of English.

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Writing**WRITING COURSES**

Choose four courses from the following list:

ENG U320	Technical Communication 1	4 SH
ENG U321	Technical Communication 2	4 SH
ENG U322	Topics in Rhetoric	4 SH

ENG U323	Topics in Technical Communication	4 SH
ENG U372	Creative Writing	4 SH
ENG U377	Poetry Workshop	4 SH
ENG U378	Fiction Workshop	4 SH
ENG U379	Nonfiction Workshop	4 SH
ENG U380	Topics in Writing	4 SH
ENG U382	Publication Arts	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Technical Communications

REQUIRED COURSE

Complete the following course:

ENG U320	Technical Communication 1	4 SH
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LANGUAGE OR COMMUNICATION THEORY ELECTIVE

Choose one of the following courses:

CMN U311	Argumentation and Debate	4 SH
CMN U510	Persuasion in Contemporary Culture	4 SH
ENG U322	Topics in Rhetoric	4 SH
ENG U323	Topics in Technical Communication	4 SH
LIN U150	Introduction to Language and Linguistics	4 SH
or ENG U150	Introduction to Language and Linguistics	4 SH
LIN U412	Language and Culture	4 SH
PHL U540	Philosophy of Language	4 SH
PSY U464	Psychology of Language	4 SH
PSY U466	Cognition	4 SH

WRITING FOR THE WORKPLACE ELECTIVE

Choose one of the following courses:

ENG U321	Technical Communication 2	4 SH
ENG U324	Writing for Computer-Related Industries	4 SH

TECHNOLOGY IN SOCIETY ELECTIVE

Choose one of the following courses:

ENG U427	The Literature of Science	4 SH
HST U222	History of Science and Technology	4 SH
HST U321	Technological Transformations	4 SH
PHL U145	Technology and Human Values	4 SH
POL U390	Science, Technology, and Public Policy	4 SH
SOC U485	Environment, Technology, and Society	4 SH
SOC U528	Computers and Society	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

ENVIRONMENTAL STUDIES

JENNIFER S. COOMBS, PHD

Program Director

PROFESSORS

Geoffrey Davies, DSc, *Chemistry*

Gwilym Jones, PhD, *Biology*

Anthony Penna, DA, *History*

ASSOCIATE PROFESSORS

Christopher Bosso, PhD, *Political Science*

Thomas R. Gilbert, PhD, *Chemistry*

Malcolm D. Hill, PhD, *Geology*

Judith Perrolle, PhD, *Sociology/Anthropology*

Peter S. Rosen, PhD, *Geology*

ASSISTANT PROFESSOR

Daniel Faber, PhD, *Sociology/Anthropology*

The environmental studies major is an interdisciplinary program designed for students who wish to apply an understanding of both social and scientific issues to the solution of environmental problems. The goal of the major is to enable students to conceptualize and to attack “unstructured problems” (that is, problems with many more variables than equations, or problems for which there may be no obvious single best solution). This type of problem dominates natural environmental systems; the solutions to environmental problems may require balancing scientific and societal concerns. By the time students graduate, they should be able to identify an environmental problem, develop a plan to address the problem, identify and organize the resources that they would need to solve the problem, and know how to implement a plan to solve the problem.

The major is structured to provide progressive development in skills and knowledge. It is flexible in that it allows latitude in upper-level course choices, selected with the approval of a faculty adviser, to suit individual student interests. Students first complete ten environmental studies prerequisite courses and two interdisciplinary environmental core courses: one to help link across two of the science prerequisite courses, and the other to focus on environmental policy making. With approval from faculty advisers, students select a set of eight upper-level electives, participate in a one semester-hour environmental seminar, and complete a four semester-hour field experience (which will also satisfy the college's experiential education requirement), perhaps the Woods Hole Sea Semester or another field study program. The senior thesis provides an opportunity to focus on a single issue in environmental problem solving.

The environmental studies minor is structured to provide progressive development in skills and knowledge. It is flexible in that it allows latitude in upper-level course choices, selected with the approval of a faculty adviser, to suit individual student interests.

BA in Environmental Studies

COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS FOR SPECIFIED PROGRAMS

See page 41 for requirement list.

ENVIRONMENTAL STUDIES MAJOR

Science Courses

Complete the following three courses:

BIO U145	Environment and Humankind	4 SH
CHM U101	General Chemistry for Health Sciences	5 SH
ENV U115	Environmental Science	4 SH

History Course

Complete the following course:

HST U342 Environmental History of North America 4 SH

Economics Course

Complete the following course:

ECN U116 Principles of Microeconomics 4 SH

Sociology Course

Complete the following course:

SOC U246 Environment and Sociology 4 SH

Political Science Courses

Complete the following two courses:

POL U150 American Government 4 SH

POL U395 Environmental Politics 4 SH

Geology Courses

Complete the following two courses:

GEO U112 Environmental Geology 4 SH

GEO U510 Environmental Planning 4 SH

Statistics Course

Choose one course from the following list:

ECN U350 Statistics 4 SH

MTH U280 Statistics and Software 4 SH

POL U400 Quantitative Techniques 4 SH

PSY U320 Statistics in Psychological Research 5 SH

SOC U320 Statistical Analysis in Sociology 4 SH

Upper-Division Electives

Choose six courses in one area. See department for area options.

Senior Thesis

Complete the following course:

ENV U700 Senior Thesis 4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ENVIRONMENTAL STUDIES

Complete 65 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Environmental Studies**SCIENCE COURSES**

Choose two courses from the following list:

BIO U145 Environment and Humankind 4 SH

CHM U211 General Chemistry 1 5 SH

GEO U112 Environmental Geology 4 SH

GEO U200 Dynamic Earth 4 SH

SOCIAL SCIENCE COURSES

Choose two courses from the following list:

ECN U116 Principles of Microeconomics 4 SH

HST U342 Environmental History of North America 4 SH

POL U150 American Government 4 SH

SOC U246 Environment and Sociology 4 SH

INTERDISCIPLINARY COURSES

Choose two courses from the following list:

GEO U510 Environmental Planning 4 SH

GEO U550 Geology and Land-Use Planning 4 SH

POL U395 Environmental Politics 4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

For more information on the environmental studies minor, contact the program director, Professor Jennifer Coombs (14 Holmes), at 617.373.3039 or at j.coombs@neu.edu.

GEOLOGY

PETER S. ROSEN, PhD

*Associate Professor and Chair***PROFESSOR**

Richard H. Bailey, PhD

ASSOCIATE PROFESSORS

Bernard L. Gordon, MS

Martin E. Ross, PhD

ACADEMIC SPECIALIST

Jennifer Coombs, PhD

Geology is an interdisciplinary science that deals with the study of the physical features, composition, history, and processes of the earth. Many geologists today are working to solve environmental problems, to develop and protect water resources, and to discover new deposits of minerals and fossil fuels.

Bachelor of Science and Bachelor of Arts programs are offered in geology and in environmental geology. These programs require course work in mathematics (through calculus), physics, and chemistry, and a set of required and elective geology courses. All students complete the College of Arts and Sciences core curriculum. Students in the Bachelor of Arts programs take a broader array of nonscience courses and must demonstrate proficiency in a foreign language. Courses in the geology major focus on the basic composition (mineralogy and petrology), structure (structural geology and stratigraphy), and surface of the earth (geomorphology and geochemistry). The environmental geology major has a greater emphasis on earth surface processes, human interactions, and land-use planning. Typical environmental geology courses include hydrogeology,

geology and land-use planning, environmental planning, groundwater geochemistry, and coastal processes.

Fieldwork is an essential component of training in geology, and many of our courses utilize field sites throughout New England to demonstrate geological processes. In addition to sponsoring these local trips, the department has taken students on longer field excursions to Iceland, to the Cascade Mountains of Washington, to the island of San Salvador in the Bahamas, and to the Grand Canyon. Students also have the option to complete undergraduate research courses with a faculty member. Undergraduate research projects usually involve substantial field and lab work completed under the guidance of the geology faculty. Honors students in geology have the opportunity to participate in special sections of geology courses and in special honors activities.

The geology program offers basic knowledge needed to work in almost any of the geologic professions in both industry and government, or to continue studies in graduate school. The major in environmental geology is particularly popular, and many of our recent graduates work for environmental or geotechnical firms. Students involved in the co-op plan typically work with local engineering, environmental consulting companies, or with government agencies. These jobs often involve assessing building sites, evaluating land use, and studying many problems concerned with groundwater contamination and remediation. See pages 278–282 for course descriptions.

BS in Geology

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR NATURAL SCIENCE MAJORS
See page 41 for requirement list.

GEOLOGY BREADTH COURSES

All courses must exceed the requirements for the Arts and Sciences core.

Mathematics

Complete the following two courses:

MTH U141	Calculus 1	4 SH
MTH U142	Calculus 2	4 SH

Chemistry

Complete the following two courses with corresponding labs:

CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH

Physics

Complete the following two courses with corresponding labs:

PHY U161	Physics 1	5 SH
PHY U165	Physics 2	5 SH

Science Elective

Choose one course at the 300 level or above from the following departments:

BIO U300 to BIO U699
CHM U300 to CHM U699
CIV U300 to CIV U699
MTH U300 to MTH U699
PHY U300 to PHY U699
TOX U300 to TOX U699

GEOLOGY MAJOR REQUIREMENTS

Earth Foundations

Complete the following five courses with corresponding labs, as applicable:

GEO U200	Dynamic Earth	4 SH
with GEO U201	Lab for GEO U200	1 SH
GEO U220	History of Earth and Life	4 SH
GEO U221	Interpreting Earth History	1 SH
GEO U310	Earth Materials	5 SH

Geological Analysis

Complete the following three courses:

GEO U320	Igneous Petrology and Volcanology	5 SH
GEO U530	Structural Geology	5 SH
GEO U540	Sedimentary Basin Analysis	5 SH

Electives

Complete four approved geology electives.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education.
Please see department for approved courses.

BS GEOLOGY

Complete 80 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required
Minimum 2.000 GPA required

BS in Environmental Geology

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR NATURAL SCIENCE MAJORS
See page 41 for requirement list.

ENVIRONMENTAL GEOLOGY BREADTH COURSES

All courses must exceed the requirements for the Arts and Sciences core.

Mathematics

Complete the following two courses:

MTH U141	Calculus 1	4 SH
MTH U142	Calculus 2	4 SH

Chemistry

Complete the following two courses with their appropriate labs:

CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH

Physics or Biology

Complete two courses from one of the two departments with corresponding labs:

PHYSICS

PHY U161	Physics 1	5 SH
PHY U165	Physics 2	5 SH

BIOLOGY		
BIO U101	Principles of Biology 1	4 SH
BIO U103	Principles of Biology 2	4 SH

Science Elective

Choose one course at the 300 level or above from the following departments:

BIO U300 to BIO U699
CHM U300 to CHM U699
CIV U300 to CIV U699
MTH U300 to MTH U699
PHY U300 to PHY U699
TOX U300 to TOX U699

ENVIRONMENTAL GEOLOGY MAJOR REQUIREMENTS**Earth Foundations**

Complete the following five courses with corresponding labs:

GEO U200	Dynamic Earth	4 SH
with GEO U201	Lab for GEO U200	1 SH
GEO U220	History of Earth and Life	4 SH
GEO U221	Interpreting Earth History	1 SH
GEO U310	Earth Materials	5 SH

Geomorphology

Complete the following course:

GEO U340	Earth Landforms and Processes	5 SH
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Hydrogeology

Complete the following course:

GEO U520	Applied Hydrogeology	5 SH
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Environmental Planning

Complete the following course:

GEO U510	Environmental Planning	4 SH
or GEO U550	Geology and Land-Use Planning	4 SH

Electives

Complete four approved geology electives.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ENVIRONMENTAL GEOLOGY

Complete 84 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Geology**REQUIRED COURSES**

Complete the following six courses:

GEO U200	Dynamic Earth	4 SH
GEO U201	Lab for GEO U200	1 SH
GEO U220	History of Earth and Life	4 SH

GEO U221	Interpreting Earth History	1 SH
GEO U310	Earth Materials	5 SH
GEO U320	Igneous Petrology and Volcanology	5 SH

GEOLOGY ELECTIVE

Choose one geology course.

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Environmental Geology**REQUIRED COURSES**

Complete the following six courses:

GEO U200	Dynamic Earth	4 SH
GEO U201	Lab for GEO U200	1 SH
GEO U220	History of Earth and Life	4 SH
GEO U221	Interpreting Earth History	1 SH
GEO U310	Earth Materials	5 SH
GEO U510	Environmental Planning	4 SH
or GEO U550	Geology and Land-Use Planning	4 SH

GEOLOGY ELECTIVE

Choose one geology course.

GPA REQUIREMENTS

2.000 GPA required in the minor

HISTORY

TBA

Chair

DISTINGUISHED PROFESSOR

Raymond H. Robinson, PhD

PROFESSORS

Ballard C. Campbell, PhD

Harvey Green, PhD

Tom Havens, PhD

Patrick Manning, PhD

Clay McShane, PhD

Anthony N. Penna, DA

ASSOCIATE PROFESSORS

Jeffrey Burds, PhD

Laura L. Frader, PhD

Christina Gilmartin, PhD

Robert L. Hall, PhD

ASSISTANT PROFESSORS

Gerald H. Herman, MA

Jeremy Prestholdt, PhD

Anna Suranyi, PhD

HONORARY PROFESSOR

William M. Fowler Jr., PhD

History is the study of the causes and consequences of changes in human events across time. Like other liberal arts disciplines, historical study trains students to think critically by reading, writing about, and discussing the human experience. History stimulates a deeper understanding of today's cultures by considering them in a global context. The study of history helps students develop powers of judgment and expression that will propel them to future leadership positions in public service, international organizations, communications, education, business, or the professions.

The department offers a broad-based Bachelor of Arts major, which includes foreign language requirements. It also offers two Bachelor of Science options: one emphasizing training in the social sciences and including requirements in statistics and computer science as well as a minor in fields such as economics, political science, or sociology; the other option prepares students in such public history fields as museum administration, archival management, or historic preservation. The department also participates in a variety of interdisciplinary offerings, including Asian studies; cinema studies; environmental studies; international affairs; Jewish studies; Latino/a studies; and women's studies.

All history majors take courses in European or world history, American history, and historical methods, as well as advanced courses in a range of historical eras and world regions. Majors complete their studies with two research seminars. Honors study is strongly encouraged for eligible students. Advanced undergraduates have the opportunity to participate in individual directed study with members of the faculty on topics of mutual interest. Cooperative education placements, fieldwork, internships, and other experiential learning activities are available.

Undergraduates who plan to teach in the public schools may combine history with education courses that can lead to state certification in Massachusetts. Those intending to teach in private secondary schools need not be certified by state authorities. Teaching positions in colleges and universities require advanced degrees at the graduate level. See pages 287–299 for course descriptions.

BA in History

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

HISTORY MAJOR REQUIREMENTS

Introductory History

Complete the following course:

HST U201 The History Colloquium 4 SH

and two courses from the following list:

HST U103 Women's Studies 4 SH

HST U110 Introduction to World History 4 SH

HST U120 Introduction to Public History 4 SH

HST U130 Introduction to American History 4 SH

HST U140 Introduction to African-American History 4 SH

HST U150 East Asian Studies 4 SH

HST U170 Introduction to European History 4 SH

HST U180 African History 4 SH

History Seminar and Historical Writing

Complete the following two courses concurrently:

HST U301 The History Seminar 4 SH

HST U302 Historical Writing 1 SH

HISTORY ELECTIVE COURSES

Complete two courses from the following range:

HST U200 to HST U699

Independent Concentration Electives

HISTORY COURSES

Choose four history courses with no more than two courses in the 200–299 range. Department approval of concentration courses required by the junior year.

PRE-1800 COURSE

Complete one course from the following list:

HST U210 Atlantic Connection 4 SH

HST U222 History of Science and Technology 4 SH

HST U250 Emergence of East Asia 4 SH

HST U252 Japanese Literature and Culture 4 SH

HST U270 Ancient Greece 4 SH

HST U271 Ancient Rome 4 SH

HST U272 The Invention of Europe 4 SH

HST U273 Belief in Magic and Science in Europe 4 SH

HST U285 Russian Civilization 4 SH

HST U310 Spread of Buddhism 4 SH

HST U330 Colonial and Revolutionary America 4 SH

HST U370 Renaissance to Enlightenment 4 SH

HST U375 Culture and Identity in Early

Modern England

HST U391 Modern African Civilization 4 SH

HST U392 African Diaspora 4 SH

HST U393 Islam and Empires 4 SH

HST U411 Environment in the Age of Discovery 4 SH

HST U475 The Culture of Europe 4 SH

CAPSTONE OR PROJECT

Complete one of the following courses:

HST U701 Capstone Seminar 4 SH

HST U903 Fieldwork in History 1 4 SH

HST U904 Fieldwork in History 2 4 SH

HST U911 Senior Project 1 4 SH

HST U912 Senior Project 2 4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Satisfied through the major.

UPPER-DIVISION ELECTIVES

Complete three courses at the 300 level or higher.

HISTORY MAJOR

Complete 45 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in HistoryCOLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR SOCIAL SCIENCE MAJORS

See page 42 for requirement list.

HISTORY MAJOR REQUIREMENTS*Introductory History*

Complete the following course:

HST U201 The History Colloquium 4 SH

and two courses from the following list:

HST U103 Women's Studies 4 SH

HST U110 Introduction to World History 4 SH

HST U120 Introduction to Public History 4 SH

HST U130 Introduction to American History 4 SH

HST U140 Introduction to African-American History 4 SH

HST U150 East Asian Studies 4 SH

HST U170 Introduction to European History 4 SH

HST U180 African History 4 SH

Statistics Course

Complete one course from the following list. (Note: SOC U320 is recommended.)

ECN U350 Statistics 4 SH

PSY U320 Statistics in Psychological Research 5 SH

SOC U320 Statistical Analysis in Sociology 4 SH

History Seminar and Historical Writing

Complete the following two courses concurrently:

HST U301 The History Seminar 4 SH

HST U302 Historical Writing 1 SH

PRE-1800 COURSE

Complete one course from the following list:

HST U210 Atlantic Connection 4 SH

HST U222 History of Science and Technology 4 SH

HST U250 Emergence of East Asia 4 SH

HST U252 Japanese Literature and Culture 4 SH

HST U270 Ancient Greece 4 SH

HST U271 Ancient Rome 4 SH

HST U272 The Invention of Europe 4 SH

HST U273 Belief in Magic and Science in Europe 4 SH

HST U285 Russian Civilization 4 SH

HST U310 Spread of Buddhism 4 SH

HST U330 Colonial and Revolutionary America 4 SH

HST U370 Renaissance to Enlightenment 4 SH

HST U375 Culture and Identity in Early

Modern England

HST U391 Modern African Civilization 4 SH

HST U392 African Diaspora 4 SH

HST U393 Islam and Empires 4 SH

HST U411 Environment in the Age of Discovery 4 SH

HST U475 The Culture of Europe 4 SH

HISTORY ELECTIVE COURSES

Complete two courses from the following range:

HST U200 to HST U699

CAPSTONE OR PROJECT

Complete one of the following courses not taken to satisfy another requirement:

HST U701 Capstone Seminar 4 SH

HST U903 Fieldwork in History 1 4 SH

HST U904 Fieldwork in History 2 4 SH

HST U911 Senior Project 1 4 SH

HST U912 Senior Project 2 4 SH

CONCENTRATION OPTIONS

Complete one of the following concentration options.

*Independent Concentration Electives***HISTORY COURSES**

Choose four HST courses with no more than two courses in the 200–299 range. Department approval on concentration courses required by the junior year.

*Public History Concentration***PUBLIC HISTORY COURSES**

Complete the following four courses:

HST U120 Introduction to Public History 4 SH

HST U631 Topics in Public History 4 SH

HST U903 Fieldwork in History 1 4 SH

HST U904 Fieldwork in History 2 4 SH

APPROVED MINOR

To complete the history degree requirements, students must complete an approved minor.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education.

Please see department for approved courses.

HISTORY MAJOR

Complete 45 semester hours for the major.

UPPER-DIVISION ELECTIVES

Complete three courses at the 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in History**REQUIRED COURSES**

Choose any four history courses with two at the 200 level or higher.

GPA REQUIREMENTS

2.000 GPA required in the minor

HUMAN SERVICES

WILFRED HOLTON, PhD

Associate Professor and Director, Sociology and Cultural Anthropology and Human Services

ADVISORY COMMITTEE

Susan Beaton, MA, *Human Service Internship Supervisor*

Margaret Dickinson, MEd, *Human Services Part-Time Lecturer*

Lori Gardinier, MSW, *Human Services Lecturer*

Gordana Rabrenovic, PhD, *Sociology/Anthropology*

PROFESSORS EMERITI

John D. Herzog, PhD

Barbara A. Schram, EdD

Human services is a behavioral sciences major that includes courses in human services psychology, sociology, and other fields. Students take basic foundation courses, skills courses, and complete an intensive fieldwork internship in Boston agencies. The major may lead to careers in many diverse areas of the helping professions or to graduate programs in social work, counseling, rehabilitation, and law. Students who major in human services select specialization areas such as: deaf studies; family and children services; psychology; counseling psychology; administration and policy; social justice, identity, and religion; and more. Students prepare for positions in both public and private agencies, including casework in social service and welfare agencies; therapeutic treatment in mental health settings; rehabilitation counseling; parole and court outreach work in programs for delinquent youth; staff work in halfway houses, drug treatment institutions, and penal institutions; community organizing; services for the aging at home and in institutions; administration in human services agencies; evaluation and grant writing for social programs; and counseling and support for deaf clients through fluency in American Sign Language. Students in the major have special opportunities to participate in the Human Services Student Organization. See pages 285–286 for course descriptions.

PREPARED SPECIALIZATIONS

Deaf Studies; Family and Children Services; Psychology/Counseling Psychology; Administration and Policy; Social Justice, Identity, and Religion.

BA in Human Services

COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS FOR SPECIFIED PROGRAMS
See page 41 for requirement list.

HUMAN SERVICES MAJOR REQUIREMENTS

Human Services

Complete the following two courses:

HS U101	Human Services Professions	4 SH
HS U300	Counseling in Human Services	4 SH

Sociology

Complete the following four courses:

SOC U101	Introduction to Sociology	4 SH
SOC U324	Human Services Research and Evaluation	4 SH
SOC U401	Social Policy and Intervention	4 SH
SOC U440	Sociology of Human Service Organization	4 SH

Psychology

Complete the following course:

PSY U101	Foundations of Psychology	4 SH
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HUMAN SERVICE ELECTIVE

Complete one course from the following list:

HS U520	Child Intervention and Treatment	4 SH
HS U540	Service and Treatments for Chemical Dependencies	4 SH
HS U560	Society, Identity, and Religion	4 SH

Senior Seminar and Internship

Complete the following two courses:

HS U700	Senior Seminar in Human Services	4 SH
HS U940	Human Services Internship	6 SH

HUMAN SERVICES SPECIALIZATION FOR BA DEGREE

Choose one of the following specializations.

Deaf Studies

Elementary ASL U101 and ASL U102 are prerequisites and are taken as part of the BA core.

Complete the following three courses:

ASL U150	Deaf People in Society	4 SH
ASL U301	Intermediate ASL 1	4 SH
ASL U501	Advanced ASL 1	2 SH

Family and Children's Services

Complete the following two required courses and choose one elective:

REQUIRED

HS U520	Child Intervention and Treatment	4 SH
SOC U255	Sociology of the Family	4 SH

ELECTIVE

CAP U460	Special Education	4 SH
CAP U480	Counseling Theories and Practice	4 SH
PSY U352	Childhood Mental Illness	4 SH
PSY U400	Personality	4 SH
PSY U404	Developmental Psychology	4 SH
SOC U256	Violence in the Family	4 SH
SOC U437	Children and Youth in Contemporary Society	4 SH

Psychology/Counseling Psychology

Complete the following two required courses and choose one elective:

REQUIRED

PSY U400	Personality	4 SH
PSY U406	Abnormal Psychology	4 SH

ELECTIVE

CAP U480	Counseling Theories and Practice	4 SH
CAP U485	Mental Health and Counseling	4 SH
CAP U502	Health Counseling	3 SH
with CAP U503	Experiencing Health Counseling	1 SH
CAP U505	Human Sexuality	4 SH
CMN U230	Interpersonal Communication	4 SH
NUR U205	Wellness	4 SH
PHL U165	Moral Problems in Medicine	4 SH
PSY U404	Developmental Psychology	4 SH

Administration and Policy

Complete the following two required courses and choose one elective:

REQUIRED

POL U165	Public Policy and Administration	4 SH
POL U385	U.S. Health and Welfare Policy	4 SH

ELECTIVE

ECN U240	Economics of Crime	4 SH
ECN U270	Economic Status of Ethnic Minorities	4 SH
SOC U240	Sociology of Prejudice and Violence	4 SH
SOC U260	Gender in a Changing Society	4 SH
SOC U270	Race and Ethnic Relations	4 SH

Social Justice, Identity, and Religion

Complete the following three required courses:

HS U560	Society, Identity, and Religion	4 SH
INT U660	Jewish Studies Module	1 SH
PHL U285	Jewish Religion and Culture	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

HUMAN SERVICES MAJOR

Complete 56 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Human Services

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR SOCIAL SCIENCE MAJORS
See page 42 for requirement list.

HUMAN SERVICES MAJOR REQUIREMENTS*Human Services*

Complete the following two courses:

HS U101	Human Services Professions	4 SH
HS U300	Counseling in Human Services	4 SH

Sociology

Complete the following four courses:

SOC U101	Introduction to Sociology	4 SH
SOC U324	Human Services Research and Evaluation	4 SH
SOC U401	Social Policy and Intervention	4 SH
SOC U440	Sociology of Human Service Organization	4 SH

HUMAN SERVICE ELECTIVE

Complete one course from the following list:

HS U520	Child Intervention and Treatment	4 SH
HS U540	Service and Treatments for Chemical Dependencies	4 SH
HS U560	Society, Identity, and Religion	4 SH

Psychology

Complete the following course:

PSY U101	Foundations of Psychology	4 SH
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Senior Seminar and Internship

Complete the following two courses:

HS U700	Senior Seminar in Human Services	4 SH
HS U940	Human Services Internship	6 SH

HUMAN SERVICES SPECIALIZATION FOR BS DEGREE

Choose one of the following specializations.

Family and Children's Services

Complete the following two required courses and choose three electives:

REQUIRED

HS U520	Child Intervention and Treatment	4 SH
SOC U255	Sociology of the Family	4 SH

ELECTIVES

CAP U460	Special Education	4 SH
CAP U480	Counseling Theories and Practice	4 SH
PSY U352	Childhood Mental Illness	4 SH
PSY U400	Personality	4 SH
PSY U404	Developmental Psychology	4 SH
SOC U256	Violence in the Family	4 SH
SOC U260	Gender in a Changing Society	4 SH
SOC U437	Children and Youth in Contemporary Society	4 SH

Psychology/Counseling Psychology

Complete the following two required courses and choose three electives:

REQUIRED

PSY U400	Personality	4 SH
PSY U406	Abnormal Psychology	4 SH

ELECTIVES

CAP U480	Counseling Theories and Practice	4 SH
CAP U485	Mental Health and Counseling	4 SH
CAP U502	Health Counseling	3 SH
with CAP U503	Experiencing Health Counseling	1 SH

CAP U505	Human Sexuality	4 SH
CMN U230	Interpersonal Communication	4 SH
NUR U205	Wellness	4 SH
PHL U165	Moral Problems in Medicine	4 SH
PSY U404	Developmental Psychology	4 SH

Administration and Policy

Complete the following two required courses and choose three electives:

REQUIRED

POL U165	Public Policy and Administration	4 SH
POL U385	U.S. Health and Welfare Policy	4 SH

ELECTIVES

ECN U240	Economics of Crime	4 SH
ECN U270	Economic Status of Ethnic Minorities	4 SH
SOC U240	Sociology of Prejudice and Violence	4 SH
SOC U270	Race and Ethnic Relations	4 SH

Social Justice, Identity, and Religion

Complete the following three required courses and choose two electives:

REQUIRED

HS U560	Society, Identity, and Religion	4 SH
INT U660	Jewish Studies Module	1 SH
PHL U285	Jewish Religion and Culture	4 SH

ELECTIVES

ENG U588	Literature in Context	4 SH
HST U431	American Jewish History	4 SH
MUS U132	Music of the Jewish People	4 SH
PHL U110	Introduction to Religion	4 SH
PHL U150	Understanding the Bible	4 SH
POL U370	Religion and Politics	4 SH
POL U470	Arab-Israeli Conflict	4 SH
POL U465	Government and Politics in the Middle East	4 SH
SOC U240	Sociology of Prejudice and Violence	4 SH
SOC U259	Women in Jewish Culture	4 SH
SOC U287	Sociology of Religion	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

HUMAN SERVICES MAJOR

Complete 56 semester hours for the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Human Services

REQUIRED COURSES

Complete the following four courses:

HS U101	Human Services Professions	4 SH
HS U300	Counseling in Human Services	4 SH
SOC U401	Social Policy and Intervention	4 SH
SOC U440	Sociology of Human Service Organization	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

For more information on the human services minor, contact the program director, Professor Will Holton (587 Holmes), at 617.373.3853 or at w.holton@neu.edu.

INTERNATIONAL AFFAIRS

ADVISORY BOARD

Shahid Alam, PhD, *Economics*

Kamran Dadkash, *Economics*

Irm Haleem, *Political Science*

Harry Kuoshu, PhD, *Modern Languages*

Adam McKeown, PhD, *History*

Suzanne P. Ogden, PhD, *Political Science*

Gordana Rabrenovic, PhD, *Sociology and Anthropology*

Harlow L. Robinson, PhD, *Modern Languages*

Denis J. Sullivan, PhD, *Political Science*

Kathrin Zippel, PhD, *Sociology and Anthropology*

The major in international affairs provides students with the opportunity to develop a deep understanding of both regional and global issues. It is intended to prepare students for the interdependent world in which they will live, work, compete, and cooperate upon graduation.

Students wishing to complete the major in international affairs take seventeen courses; in addition, students must fulfill a Foreign Language Proficiency requirement, an International Experience requirement, and the Bachelor of Arts core curriculum. Students majoring in international affairs should maintain a minimum 2.750 GPA until the beginning of their international experience. Current Northeastern students wishing to declare an international affairs major must have a minimum 2.750 GPA. See pages 299–300 for course descriptions.

BA in International Affairs

COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS FOR SPECIFIED PROGRAMS
See page 41 for requirement list.

INTERNATIONAL AFFAIRS MAJOR REQUIREMENTS

Required Courses

Complete the following five courses:

HST U211	World History Since 1945	4 SH
IAF U101	Introduction to International Affairs	4 SH
IAF U400	International Conflict and Negotiation	4 SH
POL U155	Comparative Politics	4 SH
SOA U305	Global Markets and Local Culture	4 SH

Regional Analysis

Complete three regional analysis courses, two of which must be in one region, from the list “Approved Courses: International Affairs—Regional Analysis and Global Dynamics” (see following page). See your department for possible additional courses.

Global Dynamics

Complete three global dynamics courses from the list “Approved Courses: International Affairs—Regional Analysis and Global Dynamics” (see following page). See your department for possible additional courses.

Senior Seminar/Experiential Education

Complete the following course:

IAF U700	Senior Capstone Seminar in International Affairs	4 SH
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International Experiential Education

Complete at least one “international semester” via study abroad, international internship, or international co-op.

INTERNATIONAL AFFAIRS MAJOR

Complete 48 semester hours in the major with a 3.000.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in International Affairs

REQUIRED COURSE

Complete the following course:

IAF U101	Introduction to International Affairs	4 SH
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REGIONAL ANALYSIS ELECTIVE COURSES

Complete two regional analysis courses from the list “Approved Courses: International Affairs—Regional Analysis and Global Dynamics” (see below). See your department for possible additional courses.

GLOBAL DYNAMICS ELECTIVE

Complete two global dynamics courses from the list “Approved Courses: International Affairs—Regional Analysis and Global Dynamics” (see below). See department for possible additional courses.

GPA REQUIREMENTS

2.000 GPA required in the minor

For more information on the international affairs minor, contact Professor Irm Haleem (303 Meserve) at 617.373.4400 or at i.haleem@neu.edu.

Approved Courses: International Affairs—Regional Analysis and Global Dynamics

REGIONAL ANALYSIS COURSES

Asia

HST U150	East Asian Studies	4 SH
HST U250	Emergence of East Asia	4 SH
HST U251	Modern East Asia	4 SH
HST U252	Japanese Literature and Culture	4 SH
HST U313	Gender and Revolution in Russia and China	4 SH
HST U350	Modern China	4 SH
HST U351	Japan since 1850	4 SH
HST U450	Engendering China	4 SH
HST U452	Global Chinese Migration	4 SH
HST U650	Topics in Asian History	4 SH
INT U150	East Asian Studies	4 SH
INT U444	Topics in Japanese Studies	4 SH
LNC U150	Backgrounds of Chinese Culture	4 SH
LNC U255	Chinese Film: Gender and Ethnicity	4 SH
LNJ U150	Introduction to Japanese Pop Culture	4 SH
LNJ U260	Japanese Film	4 SH
PHL U275	Eastern Religions	4 SH
PHL U290	Chinese Philosophy and Religion	4 SH
POL U480	Government and Politics in Japan	4 SH
POL U485	Government and Politics in China	4 SH

Europe

ECN U293	European Economic History	4 SH
HST U170	Introduction to European History	4 SH
HST U272	The Invention of Europe	4 SH
HST U280	Hitler's Germany	4 SH
HST U281	Holocaust	4 SH
HST U371	Europe 1870–1921	4 SH
HST U372	Gender and Society in Modern Europe	4 SH
HST U375	Culture and Identity in Early Modern England	4 SH
HST U376	The British Empire	4 SH
HST U377	Ireland and the Irish Migration	4 SH
HST U388	Borderlands: World War II in Eastern Europe	4 SH
HST U475	The Culture of Europe	4 SH
HST U485	Vienna, Prague, Budapest	4 SH
HST U670	Topics in European History	4 SH
HST U682	Topics in East European History	4 SH
LNF U150	Introduction to French Culture	4 SH
LNF U550	Masterpieces of French Literature 1	4 SH
LNF U551	Masterpieces of French Literature 2	4 SH
LNF U650	French Poetry	4 SH
LNF U651	The Splendid Century	4 SH

LNF U652	Age of Enlightenment	4 SH	POL U455	Russian Foreign Policy	4 SH
LNF U653	Romantic Heritage	4 SH	POL U465	Government and Politics in the Middle East	4 SH
LNG U270	Modern German Film and Literature	4 SH	POL U470	Arab-Israeli Conflict	4 SH
LNS U150	Spanish Culture	4 SH	POL U915	Model Arab League	4 SH
LNS U250	Cervantes and His Times	4 SH	SOA U400	Muslims, Jews, and Christians in the Middle East	4 SH
LNS U265	Spanish Civil War on Film	4 SH			
LNS U550	Masterpieces of Spanish Literature Twelfth to Seventeenth Century	4 SH	<i>Russia</i>		
LNS U551	Masterpieces of Spanish Literature Eighteenth to Twentieth Century	4 SH	INT U443	Topics in Russian Studies	4 SH
LNR U485	Vienna, Prague, Budapest	4 SH	HST U285	Russian Civilization	4 SH
PHL U270	Western Religions	4 SH	HST U286	History of the Soviet Union	4 SH
POL U435	Politics in Western Europe	4 SH	HST U313	Gender and Revolution in Russia and China	4 SH
POL U440	Politics in Northern Ireland	4 SH	HST U385	Russian Literature in Translation	4 SH
POL U445	Politics in Central and Eastern Europe	4 SH	HST U386	History of Soviet Cinema	4 SH
SOC U535	European Union: Social and Political	4 SH	HST U387	Soviet Secret Police	4 SH
	<i>Africa</i>		HST U486	Commissars and Managers: Soviet Economic History	4 SH
AFR U109	Foundations of Black Culture 1	4 SH	HST U680	Topics in Russian History	4 SH
AFR U128	Music of Africa	4 SH	HST U681	Topics in Soviet History	4 SH
AFR U180	African History	4 SH	LNR U285	Russian Civilization	4 SH
AFR U307	Africa Today	4 SH	LNR U385	Russian Literature in Translation	4 SH
AFR U390	Africa and the World in Early Times	4 SH	LNR U386	History of Soviet Cinema	4 SH
AFR U391	Modern African Civilization	4 SH	POL U450	Government and Politics in Russia	4 SH
AFR U424	Black Pandemics/Epidemiology of Disease	4 SH	POL U455	Russian Foreign Policy	4 SH
HST U180	African History	4 SH	SOC U415	Society and Culture in Russia	4 SH
HST U390	Africa and the World in Early Times	4 SH			
HST U391	Modern African Civilization	4 SH	GLOBAL DYNAMICS COURSES		
HST U392	African Diaspora	4 SH	AFR U391	Modern African Civilization	4 SH
PHL U410	Religion and Spirituality in the African Diaspora	4 SH	AFR U410	Religion and Spirituality in the African Diaspora	4 SH
POL U460	Government and Politics in Africa	4 SH	AFR U441	Third World Political Relations	4 SH
	<i>Latin America</i>		AFR U474	Black Enterprise and the Corporate World	4 SH
AFR U131	Music of Latin America and Caribbean	4 SH	AFR U639	Globalism, Racism, and Human Rights	4 SH
HST U260	Modern Latin America	4 SH	ECN U290	The Global Economy	4 SH
HST U261	The Modern Caribbean	4 SH	ECN U291	Development Economics	4 SH
HST U660	Topics in Latin American History	4 SH	ECN U635	International Economics	4 SH
INT U220	Latino, Latin American, and Caribbean Studies	4 SH	HST U110	Introduction to World History	4 SH
LNS U160	Latin American Culture	4 SH	HST U115	World History Education	1 SH
LNS U170	Caribbean Literature and Culture	4 SH	HST U202	Global Inequity	4 SH
LNS U220	Latino, Latin American, and Caribbean Studies	4 SH	HST U204	Third World Women	4 SH
LNS U240	Latin American Film	4 SH	HST U211	World History since 1945	4 SH
POL U475	Government and Politics in Latin America	4 SH	HST U214	War in the Modern World	4 SH
SOA U220	Latino, Latin American, and Caribbean Studies	4 SH	HST U315	Approaches to World History	4 SH
SOA U500	Latin American Society and Development	4 SH	HST U316	Teaching World History	1 SH
	<i>Middle East</i>		HST U452	Global Chinese Migration	4 SH
HST U290	Modern Middle East	4 SH	HST U941	Internship in World History	4 SH
HST U393	Islam and Empires	4 SH	INT U905	Cultural Studies: An International Discourse	4 SH
HST U394	Islamic Nationalism	4 SH	INT U906	Social/Economic Development Lab	4 SH
PHL U280	Islam	4 SH	PHL U130	Ethics: East and West	4 SH
PHL U285	Jewish Religion and Culture	4 SH	POL U155	Comparative Politics	4 SH
POL U450	Government and Politics in Russia	4 SH	POL U160	International Relations	4 SH
			POL U405	International Political Economy	4 SH
			POL U415	Ethnic Conflict in Comparative Politics	4 SH

POL U420	War and Political Violence	4 SH
POL U441	Third World Political Relations	4 SH
POL U510	International Law	4 SH
POL U530	Revolution and International Conflict	4 SH
POL U580	Special Topics: Comparative Politics and International Relations	4 SH
POL U610	Seminar in International Relations	4 SH
POL U910	Model United Nations	4 SH
SOA U305	Global Markets and Local Culture	4 SH

JOURNALISM

STEPHEN D. BURGARD, MS
Director and Associate Professor

PROFESSOR
Nicholas Daniloff, MA

ASSOCIATE PROFESSORS
Charles F. Fountain, MS
William Kirtz, MS
James Ross, MA
Alan Schroeder, MPA

ASSISTANT PROFESSORS
Belle Adler, MJ
Laurel Leff, MA

LECTURERS
Gladys McKie, MA
Lincoln McKie, BA

The School of Journalism prepares students for careers in news media and related fields. The skills it emphasizes—writing, editing, video and audio production, design and graphics, and online reporting—also have broad applications in numerous other disciplines.

Students may enroll in either a five-year cooperative education program or a four-year program without co-op. The school strongly advises students to obtain cooperative education experience.

Graduates work for some of the world's best newspapers and magazines, radio and television stations, online publications, wire services, public relations departments, and advertising agencies. See pages 307–309 for course descriptions.

BA in Journalism

COLLEGE OF ARTS AND SCIENCES
BA CORE REQUIREMENTS
See page 40 for requirement list.

JOURNALISM MAJOR REQUIREMENTS

Journalism Courses

Complete the following three courses with a grade of C or higher:

JRN U101	Journalism 1	4 SH
JRN U201	Journalism 2	4 SH
JRN U301	Journalism 3	4 SH

Required Journalism

Complete the following four courses:

JRN U150	Interpreting the Day's News	4 SH
JRN U350	History of Journalism	4 SH
JRN U550	Law of the Press	4 SH
JRN U650	Journalism Ethics and Issues	4 SH

Journalism Electives

Complete two journalism electives.

Journalism-Related Requirement

Complete the following course:

HST U130	Introduction to American History	4 SH
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EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

JOURNALISM MAJOR

Complete 40 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required
Minimum 2.000 GPA required

BA in Cinema Studies and Journalism

See page 60.

Minor in Journalism

REQUIRED COURSES

Complete the following six courses:

JRN U101	Journalism 1	4 SH
JRN U150	Interpreting the Day's News	4 SH
JRN U201	Journalism 2	4 SH
JRN U301	Journalism 3	4 SH
JRN U550	Law of the Press	4 SH
JRN U650	Journalism Ethics and Issues	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

LINGUISTICS

JANET H. RANDALL, PHD

Associate Professor and Coordinator of Linguistics Program

PROFESSORS

Dennis Cokely, PhD, *American Sign Language*Harlan Lane, PhD, *Doc. ès Lettres, Psychology*Joanne L. Miller, PhD, *Psychology*Steven A. Sadow, PhD, *Modern Languages*

ASSOCIATE PROFESSORS

John N. Frampton, PhD, *Mathematics*Samuel Gutmann, PhD, *Mathematics*Michael R. Lipton, PhD, *Philosophy and Religion*Neal Pearlmuter, PhD, *Psychology*

ASSISTANT PROFESSOR

John D. Coley, PhD, *Psychology*

LECTURERS

Steven Cushing, PhD, *Linguistics*Audra Dainora, PhD, *Linguistics*Rachel Hayes, PhD, *Linguistics*Heather Littlefield, MA, *Linguistics*

PROFESSOR EMERITUS

Irene R. Fairley, PhD, *English*

Linguistics is the scientific study of human language. A growing and exciting field, it has links to diverse fields including cognitive psychology, philosophy, neuroscience, computer science, artificial intelligence, sociology, language teaching, anthropology, and education. Linguistics is a key component of the emerging field of cognitive science, the study of the structure and functioning of human cognitive processes.

How do children learn to speak? How is language represented in the mind? What do all languages, including sign languages, have in common? How is language different from the communication systems used by whales, bees, and chimpanzees? What do we need to program into a computer in order to converse with it? How might we think about linguistic controversies, including debates about official languages, Ebonics, gender bias, and bilingualism in education? Linguistics attempts to answer each of these questions and covers a surprisingly broad range of topics related to language and communication.

The courses in the linguistics program come from seven departments (African-American Studies, American Sign Language, English, Modern Languages, Philosophy and Religion, Psychology, and Sociology/Anthropology). Each course is cross-listed under LIN and its other departmental prefix, and can be used interchangeably in the two areas. Many linguistics courses can be taken for credit in the honors program.

Linguistics offers a variety of co-ops, including positions at local companies involved in speech recognition and production, as well as in Northeastern's own speech perception and language processing labs. Linguistics majors can also participate in a special foreign internship opportunity, doing research at the Max Planck Institute for Psycholinguistics in the Netherlands.

Students with backgrounds in linguistics have pursued advanced degrees in fields including law, cognitive science, education, English, interpreting, business, speech pathology, computer science, and linguistics itself. Other graduates have gone on to work in research, translation, special education, and robotics. See pages 309–312 for course descriptions.

BA in Linguistics

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

LINGUISTICS MAJOR REQUIREMENTS

Required Courses

Complete the following seven courses:

LIN U150	Introduction to Language and Linguistics	4 SH
LIN U215	Symbolic Logic	4 SH
or LIN U115	Introduction to Logic	4 SH
LIN U350	Linguistic Analysis	4 SH
LIN U412	Language and Culture	4 SH
LIN U422	Phonology	4 SH
LIN U450	Syntax	4 SH
LIN U464	Psychology of Language	4 SH

Linguistics Language Requirement

Complete two courses in any combination of foreign language (from the list “Approved Courses: Foreign Language” on page 42), language family, or language structure courses in addition to the BA core requirement.

Laboratory

Complete one of the following:

LIN U610	Laboratory in Psycholinguistics	4 SH
or PSY U610	Laboratory in Psycholinguistics	4 SH

Linguistics Electives

Choose three courses from the following list:

LIN U402	African-American English	4 SH
LIN U428	African Languages	4 SH
LIN U430	Applied Linguistics	4 SH
LIN U432	Romance Linguistics	4 SH
LIN U434	Bilingualism	4 SH
LIN U436	Structure of Spanish	4 SH
LIN U438	Structure of French	4 SH
LIN U442	Sociolinguistics	4 SH
LIN U444	Linguistics in Education	4 SH
LIN U448	Issues in Linguistics	4 SH
LIN U452	Semantics	4 SH
LIN U454	History of English	4 SH
LIN U458	Topics in Linguistics	4 SH
LIN U460	ASL Linguistics	4 SH
LIN U466	Cognition	4 SH

LIN U520	Language and the Brain	4 SH
LIN U524	Language and Cognitive Development	4 SH
LIN U540	Philosophy of Language	4 SH
LIN U612	Laboratory in Cognition	4 SH
LIN U924	Directed Study	4 SH
LIN U970	Junior/Senior Project 1	4 SH
LIN U971	Junior/Senior Project 2	4 SH

LINGUISTICS SEMINAR

Complete one seminar from the following list:

LIN U654	Seminar in Linguistics	4 SH
LIN U656	Seminar in Linguistics	4 SH
LIN U658	Seminar in Psycholinguistics	4 SH
LIN U660	Seminar in Cognition	4 SH
LIN U662	Seminar in Linguistics	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete the following course:

LIN U954	Experiential Education Directed Study	4 SH
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LINGUISTICS MAJOR

Complete 76 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Linguistics

COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR SOCIAL SCIENCE MAJORS
See page 42 for requirement list.

LINGUISTICS MAJOR REQUIREMENTS

Required Courses

Complete the following seven courses:

LIN U150	Introduction to Language and Linguistics	4 SH
LIN U215	Symbolic Logic	4 SH
or LIN U115	Introduction to Logic	4 SH
LIN U350	Linguistic Analysis	4 SH
LIN U412	Language and Culture	4 SH
LIN U422	Phonology	4 SH
LIN U450	Syntax	4 SH
LIN U464	Psychology of Language	4 SH

Linguistics Language Requirement

Complete two courses in any combination of foreign language (from the list "Approved Courses: Foreign Language" on page 42), language family, or language structure courses.

Laboratory

Complete one of the following:

LIN U610	Laboratory in Psycholinguistics	4 SH
or PSY U610	Laboratory in Psycholinguistics	4 SH

Linguistics Electives

Choose three courses from the following list:

LIN U402	African-American English	4 SH
LIN U428	African Languages	4 SH
LIN U430	Applied Linguistics	4 SH
LIN U432	Romance Linguistics	4 SH
LIN U434	Bilingualism	4 SH
LIN U436	Structure of Spanish	4 SH
LIN U438	Structure of French	4 SH
LIN U442	Sociolinguistics	4 SH
LIN U444	Linguistics in Education	4 SH
LIN U448	Issues in Linguistics	4 SH
LIN U452	Semantics	4 SH
LIN U454	History of English	4 SH
LIN U458	Topics in Linguistics	4 SH
LIN U460	ASL Linguistics	4 SH
LIN U466	Cognition	4 SH
LIN U520	Language and the Brain	4 SH
LIN U524	Language and Cognitive Development	4 SH
LIN U540	Philosophy of Language	4 SH
LIN U612	Laboratory in Cognition	4 SH
LIN U924	Directed Study	4 SH
LIN U970	Junior/Senior Project 1	4 SH
LIN U971	Junior/Senior Project 2	4 SH

Linguistics Seminar

Complete one seminar from the following list:

LIN U654	Seminar in Linguistics	4 SH
LIN U656	Seminar in Linguistics	4 SH
LIN U658	Seminar in Psycholinguistics	4 SH
LIN U660	Seminar in Cognition	4 SH
LIN U662	Seminar in Linguistics	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete the following course:

LIN U954	Experiential Education Directed Study	4 SH
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LINGUISTICS MAJOR

Complete 76 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Linguistics and English

COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS FOR SPECIFIED PROGRAMS
See page 41 for requirement list.

LINGUISTICS REQUIREMENTS

Introductory and Intermediate Linguistics

Complete the following two courses:

LIN U215	Symbolic Logic	4 SH
or LIN U115	Introduction to Logic	4 SH
LIN U350	Linguistic Analysis	4 SH

Intermediate Linguistics

Complete the following three courses:

LIN U412	Language and Culture	4 SH
LIN U422	Phonology	4 SH
LIN U464	Psychology of Language	4 SH

Integrative Courses

Complete the following three courses:

LIN U150	Introduction to Language and Linguistics	4 SH
or ENG U150	Introduction to Language and Linguistics	4 SH
LIN U450	Syntax	4 SH
or ENG U450	Syntax	4 SH
LIN U454	History of English	4 SH
or ENG U454	History of English	4 SH

Linguistics Elective

Choose one course from the following list:

LIN U402	African-American English	4 SH
LIN U428	African Languages	4 SH
LIN U430	Applied Linguistics	4 SH
LIN U432	Romance Linguistics	4 SH
LIN U434	Bilingualism	4 SH
LIN U436	Structure of Spanish	4 SH
LIN U438	Structure of French	4 SH
LIN U442	Sociolinguistics	4 SH
LIN U444	Linguistics in Education	4 SH
LIN U448	Issues in Linguistics	4 SH
LIN U452	Semantics	4 SH
LIN U454	History of English	4 SH
LIN U458	Topics in Linguistics	4 SH
LIN U460	ASL Linguistics	4 SH
LIN U540	Philosophy of Language	4 SH
LIN U924	Directed Study	4 SH
LIN U970	Junior/Senior Project 1	4 SH
LIN U971	Junior/Senior Project 2	4 SH

Linguistics Seminar

Choose one seminar from the following list:

LIN U654	Seminar in Linguistics	4 SH
LIN U656	Seminar in Linguistics	4 SH

Linguistics Language Requirement

Complete two courses in any combination of foreign language (from the list "Approved Courses: Foreign Language" on page 42), language family, or language structure courses in addition to the BA core requirement.

LANGUAGE FAMILY

LIN U402	African-American English	4 SH
LIN U428	African Languages	4 SH

LANGUAGE STRUCTURE

LIN U432	Romance Linguistics	4 SH
LIN U436	Structure of Spanish	4 SH
LIN U438	Structure of French	4 SH
LIN U460	ASL Linguistics	4 SH

ENGLISH REQUIREMENTS

Literature Backgrounds

Complete the following course:

ENG U226	Backgrounds in English and American Literature	4 SH
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Literature Survey Courses

Choose three courses from the following list:

ENG U220	Survey of English Literature 1	4 SH
ENG U221	Survey of English Literature 2	4 SH
ENG U223	Survey of American Literature 1	4 SH
ENG U224	Survey of American Literature 2	4 SH

Shakespeare

Complete one course from the following list:

ENG U489	Shakespeare on Film	4 SH
ENG U611	Shakespeare	4 SH
ENG U612	Shakespeare's Comedies	4 SH
ENG U613	Shakespeare's Tragedies	4 SH
ENG U614	Topics in Shakespeare	4 SH

Literature Before 1800

Complete one course from the following list:

ENG U605	Medieval English Literature	4 SH
ENG U606	Topics in Medieval Literature	4 SH
ENG U610	Sixteenth-Century English Literature	4 SH
ENG U619	Eighteenth-Century English Literature	4 SH
ENG U620	Topics in Eighteenth-Century English Literature	4 SH
ENG U661	Early American Literature	4 SH

Literature After 1800

Complete one course from the following list:

ENG U394	Modern Film	4 SH
ENG U408	The Modern Bestseller	4 SH
ENG U409	The Modern Novel	4 SH
ENG U410	Modern Drama	4 SH
ENG U411	The Modern Short Story	4 SH
ENG U412	Contemporary Fiction	4 SH
ENG U519	American Novels 1	4 SH
ENG U520	American Novels 2	4 SH
ENG U621	Romantic Poetry	4 SH
ENG U624	Victorian Literature	4 SH
ENG U625	Topics in Victorian Literature	4 SH
ENG U626	Nineteenth-Century British Fiction	4 SH
ENG U630	Major Twentieth-Century British Novelists	4 SH
ENG U631	Twentieth-Century English Literature	4 SH
ENG U663	Early African-American Literature	4 SH
ENG U665	The American Renaissance	4 SH
ENG U667	American Realism	4 SH

ENG U668	Modern American Literature	4 SH
ENG U670	Modern African-American Literature	4 SH
ENG U671	Multiethnic Literature of the U.S.	4 SH
ENG U672	Asian-American Literature	4 SH
ENG U673	U.S. Latino/Latina Literature	4 SH
ENG U674	American Indian Literature	4 SH
ENG U676	Contemporary American Literature	4 SH
ENG U687	Modern Poetry	4 SH
ENG U688	Contemporary Poetry	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete the following course:

LIN U954	Experiential Education Directed Study	4 SH
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LINGUISTICS/ENGLISH DUAL MAJOR

Complete 76 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Linguistics and Psychology

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS FOR SPECIFIED PROGRAMS

See page 41 for requirement list.

LINGUISTICS REQUIREMENTS

Introductory Linguistics

Complete the following two courses:

LIN U150	Introduction to Language and Linguistics	4 SH
LIN U215	Symbolic Logic	4 SH
or LIN U115	Introduction to Logic	4 SH

Intermediate Linguistics

Complete the following four courses:

LIN U350	Linguistic Analysis	4 SH
LIN U412	Language and Culture	4 SH
LIN U422	Phonology	4 SH
LIN U450	Syntax	4 SH

Linguistics Elective

Choose one course from the following list:

LIN U402	African-American English	4 SH
LIN U428	African Languages	4 SH
LIN U430	Applied Linguistics	4 SH
LIN U432	Romance Linguistics	4 SH
LIN U434	Bilingualism	4 SH
LIN U436	Structure of Spanish	4 SH
LIN U438	Structure of French	4 SH
LIN U442	Sociolinguistics	4 SH
LIN U444	Linguistics in Education	4 SH
LIN U448	Issues in Linguistics	4 SH

LIN U452	Semantics	4 SH
LIN U454	History of English	4 SH
LIN U458	Topics in Linguistics	4 SH
LIN U460	ASL Linguistics	4 SH
LIN U540	Philosophy of Language	4 SH
LIN U654	Seminar in Linguistics	4 SH
LIN U656	Seminar in Linguistics	4 SH
LIN U924	Directed Study	4 SH
LIN U970	Junior/Senior Project 1	4 SH
LIN U971	Junior/Senior Project 2	4 SH

Linguistics Language Requirement

Complete two courses in one foreign language (from the list "Approved Courses: Foreign Language" on page 42) with a grade of C or better. Also complete two additional courses in any combination of foreign language (from the list "Approved Courses: Foreign Language" on page 42), language family, or language structure courses.

LANGUAGE FAMILY

LIN U402	African-American English	4 SH
LIN U428	African Languages	4 SH

LANGUAGE STRUCTURE

LIN U432	Romance Linguistics	4 SH
LIN U436	Structure of Spanish	4 SH
LIN U438	Structure of French	4 SH
LIN U460	ASL Linguistics	4 SH

PSYCHOLOGY REQUIREMENTS

Introductory and Intermediate Psychology

Complete the following two courses with corresponding labs:

PSY U101	Foundations of Psychology	4 SH
PSY U320	Statistics in Psychological Research	5 SH

Intermediate Psychology

Complete the following three courses:

PSY U402	Social Psychology	4 SH
PSY U466	Cognition	4 SH
PSY U612	Laboratory in Cognition	4 SH

Psychology Elective

Choose two courses from the following list:

PSY U356	Nonverbal Communication	4 SH
PSY U404	Developmental Psychology	4 SH
PSY U450	Learning and Motivation	4 SH
PSY U452	Introduction to Sensation and Perception	4 SH
PSY U458	Psychobiology	4 SH
PSY U520	Language and the Brain	4 SH
PSY U522	Psychology of Reading	4 SH
PSY U524	Language and Cognitive Development	4 SH
PSY U526	Categorization and Reasoning	4 SH
PSY U924	Directed Study	4 SH

Psychology Seminar

Choose one seminar from the following list:

PSY U658	Seminar in Psycholinguistics	4 SH
PSY U660	Seminar in Cognition	4 SH

Integrative Courses

Complete the following two courses:

LIN U464	Psychology of Language	4 SH
or PSY U464	Psychology of Language	4 SH
LIN U610	Laboratory in Psycholinguistics	4 SH
or PSY U610	Laboratory in Psycholinguistics	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete the following course:

LIN U954	Experiential Education Directed Study	4 SH
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LINGUISTICS AND PSYCHOLOGY DUAL MAJOR

Complete 76 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Linguistics**REQUIRED COURSES**

Complete the following course:

LIN U150	Introduction to Language and Linguistics	4 SH
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Choose two from the following:

LIN U350	Linguistic Analysis	4 SH
LIN U422	Phonology	4 SH
LIN U450	Syntax	4 SH

ELECTIVE COURSES

Choose two courses from the Department of Linguistics (or any of its cross-listed equivalents) in the 200–699 range, except that the following courses (and their cross-listed equivalents) may not be used:

LIN U215	Symbolic Logic	4 SH
LIN U466	Cognition	4 SH
LIN U612	Laboratory in Cognition	4 SH
LIN U660	Seminar in Cognition	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

For more information on the linguistics minor, contact the program director, Professor Janet Randall (565 Holmes), at 617.373.3678 or at j.randall@neu.edu.

MATHEMATICS

ROBERT C. MCOWEN, PHD

Professor and Chair

PROFESSORS

Samuel J. Blank, PhD

Bohumil Cenk, ScD

Stanley J. Eigen, PhD

Terence J. Gaffney, PhD

Maurice E. Gilmore, PhD

Arshag B. Hajian, PhD

Anthony Iarrobino, PhD

Venkatrama Lakshmi, PhD

Marc N. Levine, PhD

Mikhail Malioutov, PhD

Richard D. Porter, PhD

Egon Schulte, PhD

Jayant M. Shah, PhD

Mikhail Shubin, PhD

Alexandru I. Suici, PhD

Chuu-Lian Terng, PhD

Jerzy M. Weyman, PhD

Andrei V. Zelevinsky, PhD

ASSOCIATE PROFESSORS

Mark Bridger, PhD

Robert W. Case, PhD

Aidong Adam Ding, PhD

John N. Frampton, PhD

Eugene H. Gover, PhD

Samuel Gutmann, PhD

Solomon M. Jekel, PhD

Christopher K. King, PhD

Donald R. King, PhD

Nishan Krikorian, PhD

Alex Martsinkovsky, PhD

David Massey, PhD

Mark B. Ramras, PhD

Martin Schwarz, PhD

Thomas O. Sherman, PhD

Gordana G. Todorov, PhD

ASSISTANT PROFESSOR

Maxim Braverman, PhD

CLINICAL ASSISTANT PROFESSOR OF MATHEMATICAL PRACTICE

Carla B. Oblas, MS

LECTURERS

Rekha Bai, PhD

Joan Campbell, BS

John Lindhe, MS

Robert A. Lupi, MS

Steven W. Olson, ME

Peter J. Philiou, MS
Shu-Shih Wu, PhD

PROFESSORS EMERITI
Holland C. Filgo, PhD
Alberto R. Galmarino, PhD
Jack Warga, PhD

Mathematics is of ever-increasing importance to our society and everyday life. It has long been the language of science and technology, and provides a rich source of methods for analyzing and solving problems encountered in the physical world. Today, mathematics is essential in virtually all fields of human endeavor, including business, the arts, and the social sciences.

The Bachelor of Arts degree requires at least eleven mathematics courses and two physics courses, in addition to the study of a foreign language; it is appropriate for students who wish a broader liberal arts education. The Bachelor of Science degree requires at least fourteen mathematics courses and two physics courses but no foreign language study; it is more specialized, and it is recommended for those strongly interested in mathematics and science. The department also offers a minor degree in mathematics.

The major programs provide flexibility with elective courses. Students may take advantage of a range of interdisciplinary programs and may join a major in mathematics with one in such fields as computer science, physics, and biology.

Exceptional students are accepted in the honors program, and have the option to enroll in honors sections of several of their mathematics courses. All math majors may benefit from co-op opportunities in the scientific and business communities in Boston and elsewhere. Almost every job involves mathematically stimulating work that enables students to find out how math is used in the world around us.

Many of the mathematics courses that we offer use computers for visualization, modeling, and numerical approximation. The math computer lab features twenty-eight personal computers supported by student mentors in a pleasant physical environment.

Students planning to teach secondary-school mathematics must major in mathematics and take a specific minor in education, which includes course work and student teaching.

Mathematical training may lead to opportunities in applied research (natural sciences, engineering, economics, management, computer science) as well as in mathematical research, teaching, or industry. See pages 339–344 for course descriptions.

BA in Mathematics

COLLEGE OF ARTS AND SCIENCES
BA CORE REQUIREMENTS
See page 40 for requirement list.

MATHEMATICS MAJOR REQUIREMENTS FOR BA

Problem Solving

Complete the following course:

MTH U170 Math Discovery and Computers 4 SH

History of Mathematics

Complete the following course:

MTH U201 History of Mathematics 4 SH

Calculus

Complete the following three courses:

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U242 Calculus 2 for Science and Engineering 4 SH

MTH U341 Calculus 3 for Science and Engineering 4 SH

Intermediate and Advanced Math

Complete four courses from the following list:

MTH U371 Linear Algebra 4 SH

MTH U550 Real Analysis 4 SH

or MTH U565 Topology 4 SH

MTH U560 Geometry 4 SH

or MTH U430 Number Theory 4 SH

MTH U575 Group Theory 4 SH

Mathematics Electives

Complete two math electives at 400 level or above.

MTH U401 to MTH U799

Required Physics

Complete two courses with corresponding labs:

PHY U161 Physics 1 5 SH

PHY U165 Physics 2 5 SH

MATHEMATICS MAJOR GRADE REQUIREMENTS

A grade of C or higher is required in all math courses at level 399 and lower.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

BA MATHEMATICS MAJOR

Complete 50 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Mathematics

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR NATURAL SCIENCE MAJORS
See page 41 for requirement list.

MATHEMATICS MAJOR REQUIREMENTS FOR BS

Problem Solving

Complete the following course:

MTH U170 Math Discovery and Computers 4 SH

Calculus

Complete the following four courses:

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U242 Calculus 2 for Science and Engineering 4 SH

MTH U341 Calculus 3 for Science and Engineering 4 SH

MTH U550 Real Analysis 4 SH

Intermediate and Advanced Math

Complete the following four courses:

MTH U345 Ordinary Differential Equations 4 SH

MTH U371 Linear Algebra 4 SH

MTH U481 Probability and Statistics 4 SH

MTH U575 Group Theory 4 SH

Mathematics Electives

Complete five mathematics courses at 400 level or higher.

MTH U401 to MTH U799

Required Physics

Complete two courses with corresponding labs:

PHY U161 Physics 1 5 SH

PHY U165 Physics 2 5 SH

MATHEMATICS MAJOR GRADE REQUIREMENT

A grade of C or higher is required in all math courses at level 399 and lower.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

MATHEMATICS MAJOR

Complete 66 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three electives at the 300 level or higher.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Computer Science and Mathematics

See page 156.

Minor in Mathematics

REQUIRED COURSES

Complete the following two courses. (Biology majors may substitute MTH U151 and MTH U152.)

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U242 Calculus 2 for Science and Engineering 4 SH

INTEGRATIVE COURSES

Choose two courses from the following list:

MTH U430 Number Theory 4 SH

MTH U433 Combinatorial Mathematics 4 SH

MTH U560 Geometry 4 SH

MTH U565 Topology 4 SH

MTH U571 Advanced Linear Algebra 4 SH

MTH U575 Group Theory 4 SH

MTH U576 Rings and Fields 4 SH

MATHEMATICS ELECTIVES

Choose two upper-division courses 300 and higher:

MTH U300 to MTH U699

GPA REQUIREMENTS

2.000 GPA required in the minor

MODERN LANGUAGES

DENNIS R. COKLEY, PhD

Associate Professor and Chair

PROFESSORS

Thomas Havens, PhD

Inez Hedges, PhD

Harlow Robinson, PhD

Constance H. Rose, PhD

Stephen A. Sadow, PhD

ASSOCIATE PROFESSORS

Walter M. Gershuny, PhD

Christina Gilmartin, PhD

Bonnie S. McSorley, PhD

Holbrook C. Robinson, PhD

John Spiegel, PhD

ASSISTANT PROFESSORS

Marisol Fernandez-Garcia, PhD

Harry Kuoshu, PhD

Robert B. Modee, MA

Rei Okamoto, PhD

Alan West-Duran, PhD

LECTURERS

Michele Cao-Danh, PhD

Catherine Dunand, MA

Paul LaPlante, MA

Luigia Gina Maiellaro, PhD

Sermin Muctehitzade, MA

Rita Schneider, MA

Claudia Sokol, MD

The study of modern languages can benefit all students, regardless of their majors. The multicultural world in which we live requires increased communication among varied and often divergent cultures. Learning a new language and its culture enables students to cross cultural barriers and to achieve a more cosmopolitan, open-minded, and sensitive view of the world.

The major seeks to ensure that students become as fluent as possible in a given language and introduces them to the relevant culture of that language. For this reason, the students take a number of language classes as well as literature, cinema, and general civilization courses. In addition, students are urged to consider participating in international co-op, which prepares students to function on an everyday level in a foreign country.

The major in modern languages is currently available in Spanish and in French. It is possible to minor in French or Spanish.

A major in a modern language can form the basis for careers in teaching at the elementary, secondary, or college level; international business relations; high-tech fields; government service; journalism; library science; world affairs; travel; and community service, especially in Spanish-speaking areas. See pages 312–323 for course descriptions.

BA in French

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

FRENCH MAJOR REQUIREMENTS

Language Courses

Complete the following three courses:

LNF U301	French Conversation and Composition 1	4 SH
LNF U302	French Conversation and Composition 2	4 SH
LNF U501	Advanced French	4 SH

World Perspective

Complete the following two courses:

LNF U150	Introduction to French Culture	4 SH
LNM U250	International Perspectives	4 SH

Language and Linguistics

Complete the following course:

ENG U150	Introduction to Language and Linguistics	4 SH
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Literature and Culture

Complete the following five courses:

LNF U280	French Film and Culture	4 SH
LNF U550	Masterpieces of French Literature 1	4 SH
LNF U551	Masterpieces of French Literature 2	4 SH
LNF U650	French Poetry	4 SH
LNF U651	The Splendid Century	4 SH
or LNF U652	Age of Enlightenment	4 SH

French Seminar

Complete the following seminar:

LNF U670	Topics in French	4 SH
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Study Abroad

16 hours of course work taken on study abroad.

Capstone

Complete the following capstone:

LNF U700	Capstone Seminar	1 SH
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EXPERIENTIAL EDUCATION REQUIREMENT

Satisfied through study abroad.

FRENCH MAJOR

Complete 68 semester hours in the major including study abroad.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Spanish

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

SPANISH MAJOR REQUIREMENTS

Language Requirements

Complete the following three courses:

LNS U301	Spanish Conversation and Composition 1	4 SH
LNS U302	Spanish Conversation and Composition 2	4 SH
LNS U501	Advanced Spanish	4 SH

Language and Linguistics

Complete the following course:

ENG U150	Introduction to Language and Linguistics	4 SH
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Culture

Complete the following four courses:

LNS U150	Spanish Culture	4 SH
LNS U160	Latin American Culture	4 SH
LNM U250	International Perspectives	4 SH
LNS U240	Latin American Film	4 SH

Literature

Complete the following four courses:

LNS U250	Cervantes and His Times	4 SH
LNS U550	Masterpieces of Spanish Literature Twelfth to Seventeenth Century	4 SH
LNS U551	Masterpieces of Spanish Literature Eighteenth to Twentieth Century	4 SH
LNS U650	Latin American Literature	4 SH

Spanish Seminar

Complete the following seminar:

LNS U670	Spanish Seminar	4 SH
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Study Abroad

16 hours of course work taken on study abroad.

Capstone

Complete the following capstone:

LNS U700	Capstone Seminar	4 SH
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EXPERIENTIAL EDUCATION REQUIREMENT

Satisfied through study abroad.

SPANISH MAJOR

Complete 64 semester hours in the major including study abroad.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Cinema Studies and Modern Languages

See page 60.

Minor in French

REQUIRED COURSES

Complete the following three courses:

LNF U301	French Conversation and Composition 1	4 SH
LNF U302	French Conversation and Composition 2	4 SH
LNF U551	Masterpieces of French Literature 2	4 SH

Choose one of the following:

CIN U280	French Film and Culture	4 SH
LNF U150	Introduction to French Culture	4 SH

Choose two courses from the following list:

LNF U551	Masterpieces of French Literature 2	4 SH
LNF U650	French Poetry	4 SH
LNF U652	Age of Enlightenment	4 SH
LNF U670	Topics in French	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Spanish

REQUIRED COURSES

Complete the following three courses:

LNS U301	Spanish Conversation and Composition 1	4 SH
LNS U302	Spanish Conversation and Composition 2	4 SH
LNS U550	Masterpieces of Spanish Literature Twelfth to Seventeenth Century	4 SH
or LNS U551	Masterpieces of Spanish Literature Eighteenth to Twentieth Century	4 SH

Choose one of the following:

LNS U150	Spanish Culture	4 SH
LNS U160	Latin American Culture	4 SH
LNS U501	Advanced Spanish	4 SH

Choose two courses from the following list:

CIN U265	Spanish Civil War on Film	4 SH
LNS U170	Caribbean Literature and Culture	4 SH
LNS U250	Cervantes and His Times	4 SH
LNS U550	Masterpieces of Spanish Literature 1	4 SH
LNS U551	Masterpieces of Spanish Literature 2	4 SH
LNS U650	Latin American Literature	4 SH
LNS U651	Spanish Golden Age	4 SH
LNS U670	Spanish Seminar	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

MULTIMEDIA STUDIES

www.mmstudies.neu.edu

ANTHONY DE RITIS, MBA, PHD

Associate Professor and Director

PROFESSOR

Dennis Miller, DMA, *Music*

ASSOCIATE PROFESSORS

Edwin C. Andrews, MFA, *Visual Arts*

T. Neal Rantoul, MFA, *Visual Arts*

ACADEMIC SPECIALIST

Ann McDonald, MFA, *Visual Arts*

PART-TIME LECTURERS

Jay Laird, BS

Timothy Norris, PhD

Alan Schell, PhD

Gary Sclar, JD

CLINICAL LECTURER AND TECHNICAL DIRECTOR

Cynthia Baron, MBA, *Visual Arts*

TECHNICAL COORDINATOR

Kenneth Fye, PhD, *Multimedia Studies*

Multimedia is the delivery of rich content through digital media. Digital media broaden our exposure to new ideas and creative expressions. The media afford artists, composers, and designers new opportunities to experiment and collaborate with a wide variety of partners, such as medical researchers, mathematicians, and historians. Multimedia has made specialized computer literacy and broad-based knowledge necessities for the creative professional.

The multimedia studies dual major unites the worlds of art, music composition, design, and technology. It offers students in the Departments of Visual Arts and Music the opportunity to understand and experience the disparate disciplines that contribute to multimedia creation. It focuses equally on the issues that govern digital art and music and the creation of

sound and image. The dual major exposes students to the historical significance of changing technology and media, while preparing students to integrate their creative work with the skills they will need in the rapidly growing field of multimedia production.

Multimedia development requires intensive team interaction and a broad knowledge base. It is too complex for one individual, no matter how creative, to master. Members of a team are better able to provide expertise in their unique disciplines when they are fully aware of their team members' contributions. In addition, this collaborative approach best allows all team members to understand the context in which their contributions are used. Students in the multimedia studies dual major have many opportunities to collaborate with their peers and work with students in all four multimedia concentrations.

Multimedia production requires expert knowledge in at least one discipline, which is why students can't major in multimedia alone. To be eligible to apply to the multimedia studies program, students must:

1. complete at least one year of course work in the Departments of Music or Visual Arts.
2. be a major in good standing in one of the four creative specialties: music technology, animation, graphic design, or photography.
3. meet the separate requirements for admission to the program itself. These include submission of a portfolio of work, letters of recommendation, and a minimum GPA (cumulative grade-point average).

The multimedia studies program is a nonfreestanding dual major. Students in the program begin their work in either the Department of Music or the Department of Visual Arts and then continue to develop their core discipline while exploring the interdisciplinary multimedia course work.

The curriculum comprises four components:

- basic principles of art and design
- essential course work in music and music technology
- extradisciplinary courses to provide an historical, societal, and cultural framework
- cross-disciplinary courses specific to the program (such as Narrative for Multimedia).

The student's senior year in the program is devoted to integrating these four components. Students working in cross-disciplinary teams draw on their accumulated knowledge to develop and deliver original multimedia content.

BS in Multimedia Studies

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR ARTS/HUMANITIES MAJORS
See page 41 for requirement list.

CONCENTRATION

Choose one of the four concentrations.

Concentration in Animation

ANIMATION COURSES

Complete the following seven courses with the corresponding labs:

ART U101	History of Art before 1400	4 SH
ART U103	History of Art since 1400	4 SH
ART U124	Basic Drawing	4 SH
ART U130	Visual Studies Foundation 1	4 SH
ART U131	Visual Studies Foundation 2	4 SH
ART U180	Video Basics	4 SH
ART U290	Introduction to Digital Tools	4 SH

ANIMATION STUDIO

Complete the following five courses:

ART U175	Animation Basics	4 SH
ART U275	Animation Studio 1	4 SH
ART U375	Animation Studio 2	4 SH
ART U475	Animation Studio 3	4 SH
ART U575	Animation Studio 4	4 SH

MULTIMEDIA STUDIES

Complete the following four courses:

MMS U300	Narrative in Multimedia	4 SH
MMS U305	Programming for Multimedia	4 SH
MMS U400	Hypermedia	4 SH
MUS U220	Music and Technology 1	4 SH

CAPSTONE PROJECT

Complete the following two courses:

MMS U700	Multimedia Capstone 1	4 SH
MMS U701	Multimedia Capstone 2	4 SH

MMS ELECTIVE COURSES

Choose three courses from the following list:

ART U160	Photography 1	4 SH
MMS U450	Special Topics in Hypermedia	4 SH
MMS U500	Multimedia Studies History	4 SH
MMS U600	Business, Law, and Multimedia	4 SH
MUS U221	Music and Technology 2	4 SH

Concentration in Graphic Design

INTRODUCTORY COURSES

Complete the following five courses:

ART U130	Visual Studies Foundation 1	4 SH
ART U131	Visual Studies Foundation 2	4 SH
ART U160	Photography 1	4 SH
ART U180	Video Basics	4 SH
ART U290	Introduction to Digital Tools	4 SH

INTERMEDIATE AND ADVANCED COURSES

Complete the following seven courses:

ART U332	Design Principles and Drawing	4 SH
ART U333	Design 1 and Drawing	4 SH
ART U334	Typography 1	4 SH
ART U344	Typography 2	4 SH
ART U350	Color in Multiple Media	4 SH
ART U443	Graphic Design 2	4 SH
ART U635	Time-Based Design	4 SH

ART HISTORY

Complete the following four courses with the corresponding labs:

ART U101	History of Art before 1400	4 SH
ART U103	History of Art since 1400	4 SH
ART U240	History of Graphic Design	4 SH
or MMS U500	Multimedia Studies History	4 SH
ART U313	Twentieth-Century Art	4 SH

MULTIMEDIA STUDIES

Complete the following four courses:

MMS U300	Narrative in Multimedia	4 SH
MMS U305	Programming for Multimedia	4 SH
MMS U400	Hypermedia	4 SH
MUS U220	Music and Technology 1	4 SH

CAPSTONE PROJECT

Complete the following two courses:

MMS U700	Multimedia Capstone 1	4 SH
MMS U701	Multimedia Capstone 2	4 SH

MMS ELECTIVE COURSES

Choose three courses from the following list:

ART U175	Animation Basics	4 SH
MMS U450	Special Topics in Hypermedia	4 SH
MMS U500	Multimedia Studies History	4 SH
MMS U600	Business, Law, and Multimedia	4 SH
MUS U221	Music and Technology 2	4 SH

Concentration in Music Technology

MUSIC COURSES

Complete the following eight courses:

MUS U220	Music and Technology 1	4 SH
MUS U221	Music and Technology 2	4 SH
MUS U232	Music Recording 1	4 SH
MUS U308	Principles of Music Literature	4 SH
MUS U315	History of Electronic Music	4 SH
MUS U320	Sound Design	4 SH
MUS U331	Music Recording 2	4 SH
MUS U611	Composition for Electronic Instruments	4 SH

MUSIC THEORY AND HISTORICAL TRADITIONS

Complete the following six courses:

MUS U201	Music Theory 1	4 SH
MUS U202	Music Theory 2	4 SH
MUS U303	Music Theory 3	4 SH
MUS U304	Music Theory 4	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH

MUSIC COMPOSITION LESSONS

Complete eight hours of music composition:

MUS U903	Composition Lessons	8 SH
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MUSIC ENSEMBLE

Complete two music ensembles:

MUS U904	Chorus	1 SH
MUS U905	Band	1 SH
MUS U906	Orchestra	1 SH
MUS U911	Jazz Ensemble	1 SH
MUS U912	Rock Ensemble	1 SH

MUS U913	Blues/Rock Ensemble	1 SH
MUS U914	Create Your Own Music	1 SH
MUS U915	Chamber Ensembles	1 SH

MULTIMEDIA STUDIES

Complete the following five courses:

ART U130	Visual Studies Foundation 1	4 SH
ART U290	Introduction to Digital Tools	4 SH
MMS U300	Narrative in Multimedia	4 SH
MMS U305	Programming for Multimedia	4 SH
MMS U400	Hypermedia	4 SH

CAPSTONE PROJECT

Complete the following two courses:

MMS U700	Multimedia Capstone 1	4 SH
MMS U701	Multimedia Capstone 2	4 SH

MMS ELECTIVE COURSES

Choose two courses from the following list:

ART U160	Photography 1	4 SH
ART U175	Animation Basics	4 SH
MMS U450	Special Topics in Hypermedia	4 SH
MMS U500	Multimedia Studies History	4 SH
MMS U600	Business, Law, and Multimedia	4 SH

MUSIC TECHNOLOGY ELECTIVE

Complete one course from the following list:

MUS U230	Music Industry 1	4 SH
MUS U231	Music Industry 2	4 SH
MUS U233	Music Production for Radio and Web	4 SH
MUS U336	Computer Applications in Music Business	4 SH
MUS U551	Special Topics in Music Technology	4 SH
MUS U669	Advanced Television Production	4 SH
MMS U305	Programming for Multimedia	4 SH
MMS U400	Hypermedia	4 SH
ART U130	Visual Studies Foundation 1	4 SH
ART U175	Animation Basics	4 SH
ART U180	Video Basics	4 SH
ART U290	Introduction to Digital Tools	4 SH

Concentration in Photography

ART COURSES

Complete the following eight courses with corresponding labs:

ART U101	History of Art before 1400	4 SH
ART U103	History of Art since 1400	4 SH
ART U124	Basic Drawing	4 SH
ART U130	Visual Studies Foundation 1	4 SH
ART U131	Visual Studies Foundation 2	4 SH
ART U180	Video Basics	4 SH
ART U290	Introduction to Digital Tools	4 SH
ART U313	Twentieth-Century Art	4 SH

PHOTOGRAPHY COURSES

Complete the following seven courses:

ART U160	Photography 1	4 SH
ART U330	History of Photography	4 SH
ART U360	Photography 2	4 SH
ART U385	Still Digital Imaging	4 SH
ART U601	Alternative Analog and Digital Processes	4 SH
ART U602	Fine Art Digital Imaging	4 SH
ART U710	Senior Project in Photography 1	6 SH

MULTIMEDIA STUDIES

Complete the following four courses:

MMS U300	Narrative in Multimedia	4 SH
MMS U305	Programming for Multimedia	4 SH
MMS U400	Hypermedia	4 SH
MUS U220	Music and Technology 1	4 SH

CAPSTONE PROJECT

Complete the following two courses:

MMS U700	Multimedia Capstone 1	4 SH
MMS U701	Multimedia Capstone 2	4 SH

ELECTIVE COURSES

Choose three courses from the following list:

ART U175	Animation Basics	4 SH
MMS U450	Special Topics in Hypermedia	4 SH
MMS U500	Multimedia Studies History	4 SH
MMS U600	Business, Law, and Multimedia	4 SH
MUS U221	Music and Technology 2	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

MULTIMEDIA STUDIES MAJOR

Complete 88 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

MUSIC

LEON C. JANIKIAN, MM

Associate Professor and Acting Chair

PROFESSORS

Joshua R. Jacobson, DMA

Dennis H. Miller, DMA

Bruce Ronkin, DMA

Judith Tick, PhD

ASSOCIATE PROFESSORS

Susan Asai, PhD

Leonard L. Brown, PhD

William Lowe, MA

David D. Sonnenschein, DMA

ASSISTANT PROFESSORS

Anthony P. DeRitis, PhD

Allen G. Feinstein, MM

Emmett G. Price III, PhD

LECTURERS

James Anderson, BM

Linnea Bardarson, MM

Paul Beaudoin, PhD

Richard Berberian, MEd

Laurie Blunsom, MFA

Eve Budnick, MM

Hugo Burnham

William Drury, MM

Douglas F. Durant, PhD

Virginia Eskin, BA

Ralf Gawlik, MM

David Herlihy, JD

Ronald Herrema, PhD

George Howard, BA

Eric Jackson

Junauro Landgrebe, BM

Ernest Larouche, BA

Robert Lyons, BS

John Mallia, MM

Martha Peabody, MA

Jane Potter, BM

Shawn Radley, BS

Andrew J. Rega, BM

Carol Beth Thomas, MA

Jeremy Van Buskirk, MM

Robert Ward, MM

The music department approaches the study of music from a global, multicultural, and multifaceted perspective. The department offers four concentrations in the context of a broad liberal arts program.

The music literature and performance concentration combines history with hands-on music making; an audition is required. This concentration leads to a Bachelor of Arts degree. The music literature concentration has a historical orientation and leads to a Bachelor of Arts degree.

The music technology concentration teaches students to compose music using the newest electronic music technology, both hardware and software. Students learn techniques such as MIDI sequencing, digital and analog recording, sound design, audio for video, and the latest methods for delivering music over the Internet. Students also study composition for both acoustic and electric instruments. The concentration includes a thorough background in the fundamentals of music, including music theory and history, and leads to a Bachelor of Science degree.

The music industry concentration is the first such undergraduate program in Boston. It is designed for students with an interest in fields such as artist management, the music products industry, the record industry, art administration, contracting and legal issues, the recording process, and studio techniques. Developed in collaboration with Northeastern's College of Business Administration, the music industry concentration leads to a Bachelor of Science degree.

Through an exchange program, students may attend classes at the New England Conservatory of Music. Students also share an array of high-tech and multimedia equipment.

While some music courses are designed for music majors, the department also offers elective survey courses. Several of these courses fulfill the College of Arts and Sciences core curriculum requirement.

An extensive concert series offers a variety of performances by students, faculty, and guest artists. Students also have the opportunity to participate in our active choral groups, bands, and chamber ensembles. See pages 344–351 for course descriptions.

BA in Music with Concentration in Literature

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

MUSIC MAJOR REQUIREMENTS

FOR LITERATURE CONCENTRATION

Music Theory

Complete the following four courses:

MUS U201	Music Theory 1	4 SH
MUS U202	Music Theory 2	4 SH
MUS U303	Music Theory 3	4 SH
MUS U304	Music Theory 4	4 SH

Music History

Complete the following four courses:

MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH
MUS U550	Historical Traditions 4: Special Topics	4 SH

Music Literature

Complete the following course:

MUS U308	Principles of Music Literature	4 SH
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Piano Class

Complete the following course:

MUS U205	Piano Class 1	4 SH
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Music Ensemble

Complete five music ensembles:

MUS U904	Chorus	1 SH
MUS U905	Band	1 SH
MUS U906	Orchestra	1 SH
MUS U911	Jazz Ensemble	1 SH
MUS U912	Rock Ensemble	1 SH
MUS U913	Blues/Rock Ensemble	1 SH
MUS U914	Create Your Own Music	1 SH
MUS U915	Chamber Ensembles	1 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

MUSIC MAJOR LITERATURE CONCENTRATION

Complete 45 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Music with Concentration in Literature and Performance

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

MUSIC LITERATURE REQUIREMENTS

Music Theory

Complete four of the following courses:

MUS U201	Music Theory 1	4 SH
MUS U202	Music Theory 2	4 SH
MUS U303	Music Theory 3	4 SH
or MUS U304	Music Theory 4	4 SH
MUS U307	Sight-Singing	4 SH

Music History

Complete the following four courses:

MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH
MUS U550	Historical Traditions 4: Special Topics	4 SH

Piano Class

Complete the following course:

MUS U205	Piano Class 1	4 SH
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Music Literature

Complete the following course:

MUS U308	Principles of Music Literature	4 SH
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MUSIC PERFORMANCE REQUIREMENTS

Performance Seminar

Complete the following course:

MUS U621	Seminar in Performance Practice	4 SH
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Music Lessons

Complete five music lessons (courses are repeatable):

MUS U901	Music Lessons 1	1 SH
MUS U902	Music Lessons 2	1 SH

Ensemble

Complete seven music ensembles:

MUS U904	Chorus	1 SH
MUS U905	Band	1 SH
MUS U906	Orchestra	1 SH
MUS U911	Jazz Ensemble	1 SH
MUS U912	Rock Ensemble	1 SH
MUS U913	Blues/Rock Ensemble	1 SH
MUS U914	Create Your Own Music	1 SH
MUS U915	Chamber Ensembles	1 SH

Electives

Complete two music courses.

Recitals

Complete a middler and senior recital:

MUS U410	Recital 1	4 SH
MUS U622	Recital 2	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

MUSIC MAJOR LITERATURE AND PERFORMANCE CONCENTRATION

Complete 92 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Music with Concentration in Music Industry

COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR ARTS/HUMANITIES MAJORS

See page 41 for requirement list.

MUSIC REQUIREMENTS

Music Theory Requirement

Complete the following three courses:

MUS U203	Music Theory for Music Industry 1	4 SH
MUS U204	Music Theory for Music Industry 2	4 SH
MUS U308	Principles of Music Literature	4 SH

Music History

Complete the following four courses:

MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH
MUS U550	Historical Traditions 4: Special Topics	4 SH

Music Ensemble

Complete two music ensembles:

MUS U904	Chorus	1 SH
MUS U905	Band	1 SH
MUS U906	Orchestra	1 SH
MUS U911	Jazz Ensemble	1 SH
MUS U912	Rock Ensemble	1 SH
MUS U913	Blues/Rock Ensemble	1 SH
MUS U914	Create Your Own Music	1 SH
MUS U915	Chamber Ensembles	1 SH

Music Industry

Complete the following three courses:

MUS U230	Music Industry 1	4 SH
MUS U231	Music Industry 2	4 SH
MUS U601	Seminar in Music Industry	4 SH

Music Industry Electives

Choose four music industry courses:

MUS U220	Music and Technology 1	4 SH
MUS U221	Music and Technology 2	4 SH
MUS U232	Music Recording 1	4 SH
MUS U233	Music Production for Radio and Web	4 SH
MUS U330	Music Administration	4 SH
MUS U331	Music Recording 2	4 SH
MUS U332	Artist Management	4 SH
MUS U333	The Record Industry	4 SH
MUS U334	Music Merchandising	4 SH
MUS U335	Copyright Law for Musicians	4 SH
MUS U336	Computer Applications in Music Business	4 SH
MUS U337	Writing about Music	4 SH

MUSIC INDUSTRY BUSINESS REQUIREMENTS

Economics

Complete the following two courses:

ECN U115	Principles of Macroeconomics	4 SH
ECN U116	Principles of Microeconomics	4 SH

Accounting

Complete the following course:

ACC U201	Financial Accounting and Reporting	4 SH
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Business Electives

Choose two business courses from the following departments: ACC, FIN, HRM, MGT, MKT, or MSC.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

MUSIC INDUSTRY MAJOR

Complete 78 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Music with Concentration in Music Technology

COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR ARTS/HUMANITIES MAJORS

See page 41 for requirement list.

GENERAL MUSIC REQUIREMENTS

Music Theory Requirement

Complete the following five courses:

MUS U201	Music Theory 1	4 SH
MUS U202	Music Theory 2	4 SH
MUS U303	Music Theory 3	4 SH
MUS U304	Music Theory 4	4 SH
MUS U420	Music Composition	4 SH

Music History

Complete the following four courses:

MUS U308	Principles of Music Literature	4 SH
MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH

Lessons

Complete seven composition lessons (courses are repeatable):

MUS U903	Composition Lessons	1 SH
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Ensemble

Complete two music ensembles:

MUS U904	Chorus	1 SH
MUS U905	Band	1 SH
MUS U906	Orchestra	1 SH
MUS U911	Jazz Ensemble	1 SH
MUS U912	Rock Ensemble	1 SH
MUS U913	Blues/Rock Ensemble	1 SH
MUS U914	Create Your Own Music	1 SH
MUS U915	Chamber Ensembles	1 SH

MUSIC TECHNOLOGY REQUIREMENTS

Music Technology

Complete the following three courses:

MUS U220	Music and Technology 1	4 SH
MUS U221	Music and Technology 2	4 SH
MUS U315	History of Electronic Music	4 SH

Recording Studio

Complete the following two courses:

MUS U232	Music Recording 1	4 SH
MUS U331	Music Recording 2	4 SH

Electronic Composition and Performance

Complete the following three courses:

MUS U320	Sound Design	4 SH
MUS U520	Interactive Real-Time Performance	4 SH
MUS U611	Composition for Electronic Instruments	4 SH

Music Technology Electives

Choose two electives:

ART U130	Visual Studies Foundation 1	4 SH
ART U175	Animation Basics	4 SH
ART U180	Video Basics	4 SH
ART U290	Introduction to Digital Tools	4 SH
MMS U305	Programming for Multimedia	4 SH
MMS U400	Hypermedia	4 SH
MUS U230	Music Industry 1	4 SH
MUS U231	Music Industry 2	4 SH
MUS U233	Music Production for Radio and Web	4 SH
MUS U336	Computer Applications in Music Business	4 SH
MUS U551	Special Topics in Music Technology	4 SH
MUS U699	Advanced Television Production	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

MUSIC TECHNOLOGY MAJOR

Complete 85 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in General Music

MUSIC THEORY AND LITERATURE

Complete the following three courses:

MUS U201	Music Theory 1	4 SH
MUS U202	Music Theory 2	4 SH
MUS U308	Principles of Music Literature	4 SH

MUSIC HISTORY ELECTIVE

Choose one course from the following list:

MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH
MUS U315	History of Electronic Music	4 SH
MUS U550	Historical Traditions 4: Special Topics	4 SH

MUSIC ELECTIVE

Choose one course from the Department of Music.

GPA REQUIREMENTS

2.000 GPA required in the minor.

Minor in Music Industry

MUSIC THEORY AND LITERATURE

Complete two courses:

MUS U203	Music Theory for Music Industry 1	4 SH
or MUS U201	Music Theory 1	4 SH
MUS U101	Introduction to Music	4 SH
or MUS U308	Principles of Music Literature	4 SH

MUSIC INDUSTRY

Complete the following two courses:

MUS U230	Music Industry 1	4 SH
MUS U231	Music Industry 2	4 SH

MUSIC INDUSTRY ELECTIVES

Choose two music industry courses.

GPA REQUIREMENTS

2.000 GPA required in the minor.

Minor in Music Theatre

MUSIC THEORY, LITERATURE, AND THEATRE

Complete three courses:

MUS U201	Music Theory 1	4 SH
or MUS U203	Music Theory for Music Industry 1	4 SH
MUS U308	Principles of Music Literature	4 SH
THE U310	American Musical Theatre	4 SH

MUSIC HISTORY ELECTIVE

Choose one course from the following list:

MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH
MUS U315	History of Electronic Music	4 SH
MUS U550	Historical Traditions 4: Special Topics	4 SH

VOICE LESSONS

Complete four semesters of voice lessons (courses are repeatable):

MUS U901	Music Lessons 1	1 SH
or MUS U902	Music Lessons 2	1 SH

PERFORMANCE: CHORUS

Complete four semesters of chorus:

MUS U904	Chorus	1 SH
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MUSIC ELECTIVE

Choose one course from the Department of Music.

GPA REQUIREMENTS

2.000 GPA required in the minor.

PHILOSOPHY AND RELIGION

STEPHEN L. NATHANSON, PhD

Professor and Acting Chair

ASSOCIATE PROFESSORS

William J. DeAngelis, PhD

Patricia Illingworth, JD, PhD

Michael Lipton, PhD

Susan M. Setta, PhD

LECTURERS

D. Kerry Dugan, MEd

Margaret C. Huff, PhD

Michael C. Meyer, PhD

Philosophy addresses questions and theories related to art, religion, morality, society, and natural and social sciences. The study of philosophy challenges students to examine, through critical reflection, their beliefs in many areas.

Courses aim to provide students with an understanding of the methods and traditions of philosophical and religious thought. Through readings, discussion, and writing, students examine questions concerning the nature and validity of religious beliefs, moral judgments, and scientific theories as well as questions about values and social policy in such areas as law, medicine, and technology.

Course work in philosophy can strengthen the student's work in other areas. Philosophy majors enter diverse careers, ranging from college-level teaching to law and business. The program strives to help students sharpen their critical abilities. The department offers three ways to major in philosophy:

the standard major, the concentration in law and ethics, and the concentration in religious studies. See pages 355–360 for course descriptions.

BA/BS in Philosophy

COLLEGE OF ARTS AND SCIENCES BA OR BS CORE REQUIREMENTS FOR ARTS/HUMANITIES MAJORS

For BA core see page 40 for requirement list.

For BS core see page 41 for requirement list.

GENERAL MAJOR REQUIREMENTS

PHILOSOPHY REQUIRED COURSES

Complete the following three courses:

PHL U115	Introduction to Logic	4 SH
or PHL U215	Symbolic Logic	4 SH
PHL U325	Ancient Philosophy	4 SH
PHL U330	Modern Philosophy	4 SH

CONCENTRATION

Complete a concentration in one of two areas or complete the philosophy generalist requirements:

Philosophy Generalist Requirements

ADVANCED PHILOSOPHY ELECTIVE

Choose one course from the following list:

PHL U435	Moral Philosophy	4 SH
PHL U500	Theory of Knowledge	4 SH
PHL U505	Metaphysics	4 SH
PHL U535	Philosophy of Mind	4 SH

PHILOSOPHY SEMINAR

Choose one seminar:

PHL U901	Topics in Philosophy Seminar	4 SH
PHL U902	Great Philosophers Seminar	4 SH
PHL U903	Seminar in Religion	4 SH

ADDITIONAL ELECTIVES

Choose four additional electives in philosophy.

Concentration in Law and Ethics

MORAL AND POLITICAL ELECTIVES

Choose two elective courses:

PHL U435	Moral Philosophy	4 SH
PHL U500	Theory of Knowledge	4 SH
PHL U505	Metaphysics	4 SH
PHL U535	Philosophy of Mind	4 SH

PHILOSOPHY SEMINAR

Choose one course from the following list:

PHL U901	Topics in Philosophy Seminar	4 SH
PHL U902	Great Philosophers Seminar	4 SH
PHL U903	Seminar in Religion	4 SH

PHILOSOPHY ELECTIVE

Choose one course from the Department of Philosophy.

LAW-RELATED ELECTIVES

Choose two courses from one of the following social science departments: AFR, ECN, HS, HST, IAF, LIN, POL, PSY, SOA, and SOC. Courses are to be chosen in consultation with department.

Concentration in Religious Studies

REQUIRED COURSE

Complete the following course:

PHL U435 Moral Philosophy 4 SH

RELIGIOUS STUDIES COURSES

Choose three elective courses. See department for an approved list.

PHILOSOPHY SEMINAR

Choose one seminar:

PHL U901 Topics in Philosophy Seminar 4 SH

PHL U902 Great Philosophers Seminar 4 SH

PHL U903 Seminar in Religion 4 SH

PHL U904 Major Figures in Religious Studies 4 SH

PHILOSOPHY ELECTIVE

Choose one elective course in philosophy.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

PHILOSOPHY MAJOR

Complete 44 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Philosophy**REQUIRED COURSES**

Complete the following two courses:

PHL U325 Ancient Philosophy 4 SH

PHL U330 Modern Philosophy 4 SH

ELECTIVE COURSES

Choose three philosophy courses.

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Religious Studies**REQUIRED COURSES**

Complete the following four courses:

PHL U150 Understanding the Bible 4 SH

PHL U275 Eastern Religions 4 SH

PHL U280 Islam 4 SH

PHL U390 Cults and Sects 4 SH

ELECTIVE COURSE

Choose one religious studies elective.

GPA REQUIREMENTS

2.000 GPA required in the minor

PHYSICS

JORGE V. JOSÉ, DR SCI

Matthews Distinguished University Professor and Interim Chair

MATTHEWS DISTINGUISHED UNIVERSITY PROFESSORS

Pran Nath, PhD

Stephen Reucroft, PhD

Fa-Yueh Wu, PhD

COLLEGE OF ARTS AND SCIENCES**DISTINGUISHED PROFESSORS**

Alain S. Karma, PhD

Srinivas Sridhar, PhD

PROFESSORS

Ronald Aaron, PhD

Arun Bansil, PhD

Paul M. Champion, PhD

David A. Garelick, PhD

Haim Goldberg, PhD

Donald E. Heiman, PhD

Robert P. Lowndes, PhD

Robert S. Markiewicz, PhD

Clive H. Perry, PhD

Jeffrey B. Sokoloff, PhD

Yogendra N. Srivastava, PhD

Tomasz Taylor, PhD

Michael T. Vaughn, PhD

Allan Widom, PhD

ASSOCIATE PROFESSORS

George O. Alverson, PhD

Nathan Israeloff, PhD

J. Timothy Sage, PhD

John D. Swain, PhD

Darien Wood, PhD

ASSISTANT PROFESSORS

Emanuela Barberis, PhD

Sergey Kravchenko, PhD

Mark C. Williams, PhD

PROFESSORS EMERITI

Petros N. Argyres, PhD
 Alan H. Cromer, PhD
 Michael J. Glaubman, PhD
 Bertram J. Malenka, PhD
 Eugene J. Saletan, PhD
 Carl Shiffman, PhD
 Eberhard von Goeler, PhD

Physics examines the fundamental principles that govern natural phenomena, ranging in scale from collisions of subatomic particles, through the behavior of solids, liquids, and biomolecules, to exploding stars and colliding galaxies.

The program aims to help students experience the intellectual stimulation of studying physics and astrophysics and the excitement of frontline research; understand the basic principles and techniques of physics-related careers; and prepare for graduate study in physics or related fields.

The department offers four levels of undergraduate courses: descriptive courses for nonscience majors with limited mathematical background; general survey courses for students in scientific and engineering fields; advanced courses primarily intended for physics majors; and highly advanced courses primarily intended for prospective graduate students.

In addition to work in industrial, government, or high-technology laboratories in areas of applied physics, students may find opportunities in such fields as biological physics, computer science, geophysics, medical and radiation physics, and engineering. Many physics majors pursue advanced degrees in physics and related fields. See pages 360–363 for course descriptions.

BS in Physics

COLLEGE OF ARTS AND SCIENCES BS CORE
 REQUIREMENTS FOR NATURAL SCIENCE MAJORS
 See page 41 for requirement list.

BREADTH COURSES FOR PHYSICS

Mathematics

Complete the following six courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U345	Ordinary Differential Equations	4 SH
MTH U371	Linear Algebra	4 SH
MTH U481	Probability and Statistics	4 SH

General Engineering

Complete one general engineering course:

GE U110	Engineering Design	4 SH
or GE U111	Engineering Problem Solving and Computation	4 SH

Chemistry

Complete one introductory chemistry course with corresponding lab:

CHM U211	General Chemistry 1	5 SH
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Technical Electives

Choose two intermediate or advanced courses from the following departments:

MTH U300 to MTH U699
 PHY U300 to PHY U699
 CHM U300 to CHM U699
 BIO U300 to BIO U699
 GEO U300 to GEO U699
 CS U300 to CS U699
 CHE U300 to CHE U699
 CIV U300 to CIV U699
 ECE U300 to ECE U699
 MIM U300 to MIM U699

PHYSICS MAJOR REQUIREMENTS

Introductory Physics

Complete the following two courses with corresponding labs:

PHY U161	Physics 1	5 SH
PHY U165	Physics 2	5 SH

Intermediate Physics

Complete the following three courses:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH

Advanced Physics

Complete the following five courses:

PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U601	Classical Dynamics	4 SH
PHY U602	Electricity and Magnetism	4 SH
PHY U603	Electromagnetic Waves and Optics	4 SH
PHY U617	Quantum Mechanics	4 SH

Elective Course

Choose one course from the following list:

PHY U500	Physics with Computers	4 SH
PHY U611	Astrophysics and Cosmology	4 SH
PHY U613	Particle and Nuclear Physics	4 SH
PHY U614	Condensed Matter Physics	4 SH

Senior Capstone and Experiential Education

Complete the following two courses:

PHY U700	Advanced Physics Laboratory 2	4 SH
PHY U954	Experiential Education Directed Study	4 SH

BS PHYSICS MAJOR

Complete 91 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Applied Physics

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR NATURAL SCIENCE MAJORS
See page 41 for requirement list.

BREADTH COURSES FOR APPLIED PHYSICS*Mathematics Courses*

Complete the following four courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U345	Ordinary Differential Equations	4 SH

General Engineering

Complete one general engineering course:

GE U111	Engineering Problem Solving and Computation	4 SH
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Chemistry

Complete the following course with corresponding lab:

CHM U211	General Chemistry 1	5 SH
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Computer Science

Complete two intermediate or advanced computer sciences courses:

CS U300 to CS U699

Technical Electives

Choose four intermediate or advanced courses from the following list:

MTH U300 to MTH U699
PHY U300 to PHY U699
CHM U300 to CHM U699
BIO U300 to BIO U699
GEO U300 to GEO U699
CS U300 to CS U699
CHE U300 to CHE U699
CIV U300 to CIV U699
ECE U300 to ECE U699
MIM U300 to MIM U699

APPLIED PHYSICS MAJOR REQUIREMENTS*Introductory Physics*

Complete the following two courses with corresponding lab:

PHY U161	Physics 1	5 SH
PHY U165	Physics 2	5 SH

Intermediate Physics

Complete the following three courses:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH

Advanced Physics

Complete the following two courses:

PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U602	Electricity and Magnetism	4 SH

Advanced Physics Elective

Choose one course from the following list:

PHY U500	Physics with Computers	4 SH
PHY U603	Electromagnetic Waves and Optics	4 SH

PHY U611	Astrophysics and Cosmology	4 SH
PHY U613	Particle and Nuclear Physics	4 SH
PHY U614	Condensed Matter Physics	4 SH

Senior Capstone and Experiential Education

Complete the following two courses:

PHY U700	Advanced Physics Laboratory 2	4 SH
PHY U954	Experiential Education Directed Study	4 SH

BS APPLIED PHYSICS MAJOR

Complete 86 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Computer Science and Physics

See page 157.

Minor in Physics**REQUIRED COURSES**

Complete one of the following sequences:

PHY U161	Physics 1	5 SH
and PHY U165	Physics 2	5 SH
or PHY U151	Physics for Engineering 1	5 SH
and PHY U155	Physics for Engineering 2	5 SH

ELECTIVE COURSES

Choose three courses from the following list:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH
PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U601	Classical Dynamics	4 SH
PHY U602	Electricity and Magnetism	4 SH
PHY U603	Electromagnetic Waves and Optics	4 SH
PHY U611	Astrophysics and Cosmology	4 SH
PHY U613	Particle and Nuclear Physics	4 SH
PHY U614	Condensed Matter Physics	4 SH
PHY U621	Biological Physics 1	4 SH
PHY U623	Medical Physics	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

BS/MS in Applied Physics and Engineering

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR NATURAL SCIENCE MAJORS
See page 41 for requirement list.

BREADTH COURSES FOR APPLIED PHYSICS

MATHEMATICS COURSES

Complete the following four courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U345	Ordinary Differential Equations	4 SH

GENERAL ENGINEERING

Complete one general engineering course:

GE U111	Engineering Problem Solving and Computation	4 SH
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CHEMISTRY

Complete the following course with corresponding lab:

CHM U211	General Chemistry 1	5 SH
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APPLIED PHYSICS MAJOR REQUIREMENTS

INTRODUCTORY PHYSICS

Complete the following two courses with corresponding labs:

PHY U161	Physics 1	5 SH
PHY U165	Physics 2	5 SH

INTERMEDIATE PHYSICS

Complete the following three courses:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH

ADVANCED PHYSICS

Complete the following four courses:

PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U602	Electricity and Magnetism	4 SH
PHY U603	Electromagnetic Waves and Optics	4 SH
PHY U617	Quantum Mechanics	4 SH

SENIOR CAPSTONE AND EXPERIENTIAL EDUCATION

Complete the following two courses:

PHY U700	Advanced Physics Laboratory 2	4 SH
PHY U954	Experiential Education Directed Study	4 SH

ELECTRICAL AND COMPUTER ENGINEERING MAJOR REQUIREMENTS

ENGINEERING UNDERGRADUATE REQUIREMENTS

LINEAR CIRCUITS

Complete the following course:

ECE U400	Linear Circuits	4 SH
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ELECTRONICS

Complete the following course with corresponding lab:

ECE U402	Electronics	4 SH
with ECE U403	Lab for ECE U402	1 SH

LINEAR SYSTEMS

Complete the following course with corresponding lab:

ECE U464	Electronics	4 SH
with ECE U465	Lab for ECE U464	1 SH

ENGINEERING GRADUATE REQUIREMENTS

Complete the following two courses:

ECE G200	Linear Systems Analysis	4 SH
ECE G204	Applied Probability and Stochastic Processes	4 SH

ENGINEERING GRADUATE ELECTIVES

Choose six courses from the ECE graduate department.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

150 total semester hours required

Minimum 2.000 GPA required

POLITICAL SCIENCE

DENIS J. SULLIVAN, PhD

Professor and Chair

DISTINGUISHED PROFESSOR

Michael S. Dukakis, JD

EDWARD BROOKE PROFESSOR

David E. Schmitt, PhD

THOMAS P. O'NEILL CHAIR IN PUBLIC LIFE

William Crotty, PhD

RUSSELL B. AND ANDRÉE B. STEARNS TRUSTEE
PROFESSOR OF POLITICAL ECONOMY

Barry Bluestone, PhD

PROFESSORS

Robert E. Gilbert, PhD

Minton F. Goldman, PhD

Ronald D. Hedlund, PhD

Eileen L. McDonagh, PhD

William F. S. Miles, PhD

Suzanne P. Ogden, PhD

John H. Portz, PhD

David A. Rochefort, PhD

ASSOCIATE PROFESSORS

Amilcar A. Barreto Jr., PhD

Christopher J. Bosso, PhD

L. Gerald Bursey, PhD

William D. Kay, PhD

William G. Mayer, PhD

Michael C. Tolley, PhD

Bruce A. Wallin, PhD

ASSISTANT PROFESSORS

Irm Haleem, PhD (Visiting)

Richard L. O'Bryant, PhD

Political science majors study the art and science of politics, the structure and functions of government, political behavior, and public policy making. Political science is interdisciplinary by nature, so students will learn about the political and policy dimensions of societies, economic systems, and cultures, today and across time, both in the United States and in other nations.

Political science majors can choose from a wide array of courses in American politics, international relations, comparative politics, public administration, and political theory. Majors can follow a general studies path, selecting from among electives as they go along, or they can pursue more structured and more specialized concentrations in law and legal issues, international and comparative politics, or public policy and administration. Most majors participate in the cooperative education program, with placements in state and federal government agencies, law firms, nonprofit institutions, and corporations. Many students complete either a co-op position or an internship with a congressional representative, a senator, a governor, or other elected public servant.

Students may also participate in extracurricular programs designed to expand their leadership ability, such as the Model United Nations, the Model Arab League, moot court, the student government, or the College Democrats or College Republicans. Many students study in one of the college's international programs, such as the Irish studies program, which includes an internship in the Irish Parliament. Qualified students may be selected for the honors program and join the activities of the political science honor society.

A major in political science helps prepare students for law school, graduate school, and careers in the government and the nonprofit sector, as well as for teaching, journalism, legislative or lobbying positions, public relations activities, and work in international corporations. See pages 368–374 for course descriptions.

BA in Political Science

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

POLITICAL SCIENCE MAJOR REQUIREMENTS

Political Science Requirements

Complete the following four courses:

POL U150	American Government	4 SH
POL U155	Comparative Politics	4 SH
POL U160	International Relations	4 SH
POL U400	Quantitative Techniques	4 SH

Political Theory

Complete one course from the following list:

POL U326	Premodern Political Thought	4 SH
POL U328	Modern Political Thought	4 SH
POL U330	American Political Thought	4 SH
POL U332	Contemporary Political Thought	4 SH

Political Science Experiential Education

Complete the two required courses and one additional course from the following list:

REQUIRED

POL U101	Experiential Education Preparatory Workshop	1 SH
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POL U700	Political Science Senior Capstone Course	2 SH
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ONE ADDITIONAL

POL U905	Moot Court	4 SH
POL U910	Model United Nations	4 SH
POL U915	Model Arab League	4 SH
POL U940	Internship in Politics	4 SH
POL U943	Community-Based Research Practicum	4 SH

POLITICAL SCIENCE ELECTIVES FOR BA

Complete six intermediate or advanced political science electives:

POL U300 to POL U699

CONCENTRATIONS

Choose one of the following concentrations. You may use four courses from the electives to fulfill a concentration.

Law and Legal Issues Concentration

Complete four courses from the following list:

POL U300	The U.S. Congress	4 SH
POL U324	Law and Society	4 SH
POL U330	American Political Thought	4 SH
POL U335	Budgeting and Taxation	4 SH
POL U385	U.S. Health and Welfare Policy	4 SH
POL U500	U.S. Constitutional Law	4 SH
POL U505	U.S. Civil Liberties	4 SH
POL U510	International Law	4 SH
POL U615	Seminar in Public Law	4 SH

International and Comparative Politics

Complete four courses from the following list:

POL U370	Religion and Politics	4 SH
POL U405	International Political Economy	4 SH
POL U415	Ethnic Conflict in Comparative Politics	4 SH
POL U420	War and Political Violence	4 SH
POL U425	U.S. Foreign Policy	4 SH
POL U435	Politics in Western Europe	4 SH
POL U440	Politics in Northern Ireland	4 SH
POL U445	Politics in Central and Eastern Europe	4 SH
POL U450	Government and Politics in Russia	4 SH
POL U455	Russian Foreign Policy	4 SH
POL U460	Government and Politics in Africa	4 SH
POL U465	Government and Politics in the Middle East	4 SH
POL U475	Government and Politics in Latin America	4 SH
POL U480	Government and Politics in Japan	4 SH
POL U485	Government and Politics in China	4 SH
POL U510	International Law	4 SH
POL U530	Revolution and International Conflict	4 SH

Public Policy and Administration

Complete four courses from the following list:

POL U165	Public Policy and Administration	4 SH
POL U300	The U.S. Congress	4 SH

POL U305	The American Presidency	4 SH
POL U315	Interest Groups and Public Policy	4 SH
POL U334	Bureaucracy and Government Organizations	4 SH
POL U335	Budgeting and Taxation	4 SH
POL U340	Business and Government	4 SH
POL U345	Urban Policies and Politics	4 SH
POL U350	State and Local Politics	4 SH
POL U355	Intergovernmental Relations	4 SH
POL U360	Politics of Poverty	4 SH
POL U390	Science, Technology, and Public Policy	4 SH
POL U395	Environmental Politics	4 SH
POL U400	Quantitative Techniques	4 SH
POL U405	International Political Economy	4 SH
POL U425	U.S. Foreign Policy	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

POLITICAL SCIENCE MAJOR

Complete 51 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Political Science**COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR SOCIAL SCIENCE MAJORS**

See page 42 for requirement list.

POLITICAL SCIENCE MAJOR REQUIREMENTS*Political Science Requirements*

Complete the following four courses:

POL U150	American Government	4 SH
POL U155	Comparative Politics	4 SH
POL U160	International Relations	4 SH
POL U400	Quantitative Techniques	4 SH

Political Theory

Complete one course from the following list:

POL U326	Premodern Political Thought	4 SH
POL U328	Modern Political Thought	4 SH
POL U330	American Political Thought	4 SH
POL U332	Contemporary Political Thought	4 SH

Political Science Experiential Education

Complete the two required courses and one additional course from the following list:

REQUIRED

POL U101	Experiential Education Preparatory Workshop	1 SH
POL U700	Political Science Senior Capstone Course	2 SH

ONE ADDITIONAL

POL U905	Moot Court	4 SH
POL U910	Model United Nations	4 SH
POL U915	Model Arab League	4 SH
POL U940	Internship in Politics	4 SH
POL U943	Community-Based Research Practicum	4 SH

POLITICAL SCIENCE ELECTIVES FOR BS

Complete eight intermediate or advanced political science electives:

POL U300 to POL U699

CONCENTRATIONS

Choose one of the following concentrations. You may use four courses from the electives to fulfill a concentration.

Law and Legal Issues Concentration

Complete four courses from the following list:

POL U300	The U.S. Congress	4 SH
POL U324	Law and Society	4 SH
POL U330	American Political Thought	4 SH
POL U335	Budgeting and Taxation	4 SH
POL U385	U.S. Health and Welfare Policy	4 SH
POL U500	U.S. Constitutional Law	4 SH
POL U505	U.S. Civil Liberties	4 SH
POL U510	International Law	4 SH
POL U615	Seminar in Public Law	4 SH

International and Comparative Politics

Complete four courses from the following list:

POL U370	Religion and Politics	4 SH
POL U405	International Political Economy	4 SH
POL U415	Ethnic Conflict in Comparative Politics	4 SH
POL U420	War and Political Violence	4 SH
POL U425	U.S. Foreign Policy	4 SH
POL U435	Politics in Western Europe	4 SH
POL U440	Politics in Northern Ireland	4 SH
POL U445	Politics in Central and Eastern Europe	4 SH
POL U450	Government and Politics in Russia	4 SH
POL U455	Russian Foreign Policy	4 SH
POL U460	Government and Politics in Africa	4 SH
POL U465	Government and Politics in the Middle East	4 SH
POL U475	Government and Politics in Latin America	4 SH
POL U480	Government and Politics in Japan	4 SH
POL U485	Government and Politics in China	4 SH
POL U510	International Law	4 SH
POL U530	Revolution and International Conflict	4 SH

Public Policy and Administration

Complete four courses from the following list:

POL U165	Public Policy and Administration	4 SH
POL U300	The U.S. Congress	4 SH
POL U305	The American Presidency	4 SH
POL U315	Interest Groups and Public Policy	4 SH
POL U334	Bureaucracy and Government Organizations	4 SH

POL U335	Budgeting and Taxation	4 SH
POL U340	Business and Government	4 SH
POL U345	Urban Policies and Politics	4 SH
POL U350	State and Local Politics	4 SH
POL U355	Intergovernmental Relations	4 SH
POL U360	Politics of Poverty	4 SH
POL U390	Science, Technology, and Public Policy	4 SH
POL U395	Environmental Politics	4 SH
POL U400	Quantitative Techniques	4 SH
POL U405	International Political Economy	4 SH
POL U425	U.S. Foreign Policy	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

POLITICAL SCIENCE MAJOR

Complete 59 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Political Science

REQUIRED COURSES

Complete one of the following courses:

POL U150	American Government	4 SH
POL U155	Comparative Politics	4 SH
POL U160	International Relations	4 SH

ELECTIVE COURSES

Choose three political science courses.

GPA REQUIREMENTS

2.000 GPA required in the minor

PSYCHOLOGY

STEPHEN G. HARKINS, PhD

Professor and Chair

MATTHEWS DISTINGUISHED UNIVERSITY PROFESSORS

Harlan Lane, PhD, *Doc. ès Lettres*

Joanne L. Miller, PhD

COLLEGE OF ARTS AND SCIENCES

DISTINGUISHED PROFESSOR

Judith A. Hall, PhD

PROFESSORS

Rhea T. Eskew, PhD

Harry A. Mackay, PhD

Adam J. Reeves, PhD

ASSOCIATE PROFESSORS

Martin L. Block, PhD

Perrin S. Cohen, PhD

C. Randall Colvin, PhD

Denise Jackson, PhD

Franklin Naarendorp, PhD

Neal Pearlmuter, PhD

ASSISTANT PROFESSORS

John D. Coley, PhD

David A. DeSteno, PhD

Richard Gramzow, PhD

Richard H. Melloni Jr., PhD

ACADEMIC SPECIALISTS

Daniel F. Quinn, PhD

Nancy P. Snyder, EdD

LECTURER

David R. Barkmeier, PhD

Ppsychology is the science of behavior and mental processes. Using studies of humans and animals, psychologists seek to explain the behaviors and mental life of individuals in addition to developing methods for promoting their psychological well-being.

The psychology curriculum explores such topics as how brain function determines behavior; how we see, hear, and learn; what constitutes abnormal personality; how people develop emotionally and cognitively; and how individuals work in groups. Through laboratory practice and experimentation, individual research projects, and small-group seminars, the program encourages critical evaluation of psychology's accomplishments and its future.

The Bachelor of Arts degree is intended for students who wish to pursue a broad liberal arts education that explores the humanities, the social sciences, and to a lesser extent the natural sciences. The Bachelor of Science degree is more specialized and is usually recommended for students who have a strong scientific interest in psychology and the natural sciences.

The psychology department offers honors sections of introductory psychology, as well as honors activities in other courses. All students are eligible for directed study courses, which are individualized study or research experiences under the supervision of a faculty member. Co-op placements are based in both community (often mental health) and laboratory settings.

A solid scientific background in psychology helps prepare students for careers in teaching, business, public service, or research, and provides a foundation for graduate study in all areas of psychology, including clinical, as well as in law and medicine. See pages 376–381 for course descriptions.

BA in Psychology

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

PSYCHOLOGY MAJOR REQUIREMENTS*Introductory Course*

Complete the following course:

PSY U101 Foundations of Psychology 4 SH

Personal/Social Bases of Behavior

Complete two courses from the following list:

PSY U400 Personality 4 SH

PSY U402 Social Psychology 4 SH

PSY U404 Developmental Psychology 4 SH

PSY U406 Abnormal Psychology 4 SH

Biological/Cognitive Bases of Behavior

Complete two courses from the following list:

PSY U450 Learning and Motivation 4 SH

PSY U452 Introduction to Sensation and Perception 4 SH

PSY U458 Psychobiology 4 SH

PSY U464 Psychology of Language 4 SH

or PSY U466 Cognition 4 SH

Statistics

Complete the following course with corresponding lab:

PSY U320 Statistics in Psychological Research 5 SH

Psychology Seminar

Complete one seminar from the following list:

PSY U650 Seminar in Clinical Case Study 4 SH

PSY U652 Seminar in Ethics in Psychology 4 SH

PSY U654 Seminar in Behavioral Modification 4 SH

PSY U656 Seminar in Psychobiology 4 SH

PSY U658 Seminar in Psycholinguistics 4 SH

PSY U660 Seminar in Cognition 4 SH

PSY U662 Seminar in Personality 4 SH

PSY U664 Seminar in Social Psychology 4 SH

PSY U666 Seminar in Clinical Psychology 4 SH

PSY U668 Seminar in Sensation and Perception 4 SH

PSY U670 Seminar in Research Psychology 4 SH

PSY U672 Seminar in History and Theories
of Psychology 4 SH*Lab Requirement*Complete two psychology lab courses or one psychology lab
course and one psychology directed study:**LAB**

PSY U600 Research Design in Psychology 4 SH

PSY U602 Experiments in Learning and Motivation 4 SH

PSY U604 Laboratory in Learning and Motivation 4 SH

PSY U606 Laboratory in Psychobiology 4 SH

PSY U608 Lab in Animal Behavior Research 4 SH

PSY U610 Laboratory in Psycholinguistics 4 SH

PSY U612 Laboratory in Cognition 4 SH

PSY U614 Laboratory in Social Psychology 4 SH

PSY U616 Laboratory in Personality 4 SH

PSY U618 Laboratory in Community Psychology 4 SH

PSY U620 Laboratory in Industrial/Organizational
Psychology 4 SH

PSY U622 Laboratory in Sensation and Perception 4 SH

If only one lab is taken, complete one psychology directed
study:

PSY U924 Directed Study 4 SH

Major Electives

Complete three elective psychology courses.

EXPERIENTIAL EDUCATION REQUIREMENTComplete one course in experiential education. Please see
department for approved courses.**BA PSYCHOLOGY MAJOR**

Complete 48 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVESAdditional courses taken beyond college and major course
requirements to satisfy graduation credit requirements.**COOPERATIVE EDUCATION**

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Psychology

COLLEGE OF ARTS AND SCIENCES BS CORE

REQUIREMENTS FOR SOCIAL SCIENCE MAJORS

See page 42 for requirement list.

PSYCHOLOGY MAJOR REQUIREMENTS*Introductory Course*

Complete the following course:

PSY U101 Foundations of Psychology 4 SH

Personal/Social Bases of Behavior

Complete two courses from the following list:

PSY U400 Personality 4 SH

PSY U402 Social Psychology 4 SH

PSY U404 Developmental Psychology 4 SH

PSY U406 Abnormal Psychology 4 SH

Biological/Cognitive Bases of Behavior

Complete two courses from the following list:

PSY U450 Learning and Motivation 4 SH

PSY U452 Introduction to Sensation and Perception 4 SH

PSY U458 Psychobiology 4 SH

PSY U464 Psychology of Language 4 SH

or PSY U466 Cognition 4 SH

Statistics

Complete the following course with corresponding lab:

PSY U320 Statistics in Psychological Research 5 SH

Psychology Seminar

Complete one seminar from the following list:

PSY U650	Seminar in Clinical Case Study	4 SH
PSY U652	Seminar in Ethics in Psychology	4 SH
PSY U654	Seminar in Behavioral Modification	4 SH
PSY U656	Seminar in Psychobiology	4 SH
PSY U658	Seminar in Psycholinguistics	4 SH
PSY U660	Seminar in Cognition	4 SH
PSY U662	Seminar in Personality	4 SH
PSY U664	Seminar in Social Psychology	4 SH
PSY U666	Seminar in Clinical Psychology	4 SH
PSY U668	Seminar in Sensation and Perception	4 SH
PSY U670	Seminar in Research Psychology	4 SH
PSY U672	Seminar in History and Theories of Psychology	4 SH

Lab Requirement

Complete three psychology lab courses or two psychology lab courses and one psychology directed study:

LAB

PSY U600	Research Design in Psychology	4 SH
PSY U602	Experiments in Learning and Motivation	4 SH
PSY U604	Laboratory in Learning and Motivation	4 SH
PSY U606	Laboratory in Psychobiology	4 SH
PSY U608	Lab in Animal Behavior Research	4 SH
PSY U610	Laboratory in Psycholinguistics	4 SH
PSY U612	Laboratory in Cognition	4 SH
PSY U614	Laboratory in Social Psychology	4 SH
PSY U616	Laboratory in Personality	4 SH
PSY U618	Laboratory in Community Psychology	4 SH
PSY U620	Laboratory in Industrial/Organizational Psychology	4 SH
PSY U622	Laboratory in Sensation and Perception	4 SH

If only three labs are taken, complete one psychology directed study:

PSY U924	Directed Study	4 SH
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Major Elective

Complete four elective psychology courses.

Related Electives

See the department for approved courses in math, natural sciences, and other Department of Psychology related courses.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

BS PSYCHOLOGY MAJOR

Complete 56 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Linguistics and Psychology

See page 85.

BS in Computer Science and Cognitive Psychology

See page 154.

Minor in Psychology**REQUIRED COURSE**

Complete the following course:

PSY U101	Foundations of Psychology	4 SH
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ADDITIONAL COURSES

Choose one of the following courses:

PSY U400	Personality	4 SH
PSY U402	Social Psychology	4 SH
PSY U404	Developmental Psychology	4 SH
PSY U406	Abnormal Psychology	4 SH

Choose one of the following courses:

PSY U450	Learning and Motivation	4 SH
PSY U452	Introduction to Sensation and Perception	4 SH
PSY U458	Psychobiology	4 SH
PSY U464	Psychology of Language	4 SH
or PSY U466	Cognition	4 SH

ELECTIVE COURSES

Choose two additional psychology courses.

GPA REQUIREMENTS

2.000 GPA required in the minor

SOCIOLOGY AND ANTHROPOLOGY

THOMAS H. KOENIG, PhD

Professor and Acting Chair

MATTHEWS DISTINGUISHED UNIVERSITY PROFESSOR

Debra R. Kaufman, PhD

BRUDNICK PROFESSOR

Jack Levin, PhD

RUSSELL B. AND ANDRÉE B. STEARNS TRUSTEE

PROFESSOR OF POLITICAL ECONOMY

Barry Bluestone, PhD

PROFESSORS

Arnold Arluke, PhD

Winifred Breines, PhD

Michael E. Brown, PhD

Alan M. Klein, PhD

Thomas M. Shapiro, PhD

ASSOCIATE PROFESSORS

Carlos De La Torre, PhD
 Daniel R. Faber, PhD
 Luis M. Falcón, PhD
 Wilfred E. Holton, PhD
 T. Anthony Jones, PhD
 Maureen Kelleher, PhD
 Judith Perrolle, PhD
 Gordana Rabrenovic, PhD

ASSISTANT PROFESSORS

Matthew O. Hunt, PhD
 Carmen Martinez Novo, PhD
 Kathrin Zippel, PhD

PROFESSORS EMERITI

Carol A. Owen, PhD
 Morton Rubin, PhD
 Earl Rubington, PhD

Sociology and anthropology provide the critical perspective needed for studying the social arrangements in which people live, in particular, for understanding how societies function, for studying the conditions under which people change society, and for describing the modes and conditions of cooperation that make social life possible.

Courses in the program examine such areas as gender, race, class, cities, conflict, law and crime, multiculturalism and intercultural relations, technology and the environment, education, media, and the comparative interdisciplinary analyses of societies. Many courses are directly relevant to majors in other fields, including economics, political science, philosophy, literature, criminal justice, and business.

A major in sociology or anthropology helps prepare students for careers in public or private service, including such fields as law, teaching, social work, administration or management, and research. See pages 390–395 for sociology course descriptions and pages 388–390 for anthropology course descriptions.

BA in Sociology

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

SOCIOLOGY MAJOR REQUIREMENTS

Required Courses

Complete the following four courses:

SOC U101	Introduction to Sociology	4 SH
SOC U300	Social Theory	4 SH
SOC U320	Statistical Analysis in Sociology	4 SH
SOC U321	Research Methods in Sociology	4 SH

Anthropology

Complete the following course:

SOA U101	Peoples and Cultures	4 SH
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Senior Seminar

Complete one senior seminar:

SOC U600	Senior Seminar	4 SH
or SOA U600	Senior Seminar in Cultural Anthropology	4 SH

REQUIRED SOCIOLOGY ELECTIVES

Introductory Sociology Electives

Complete four courses in the following range:

SOC U200 to SOC U299

Intermediate Sociology Electives

Complete two courses in the following range:

SOC U300 to SOC U499

Advanced Sociology Electives

Complete one course in the following range:

SOC U500 to SOC U699

Social Science Electives

Choose four courses from the following departments:

AFR, ECN, HST, IAF, LIN, POL, or PSY.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

SOCIOLOGY MAJOR

Complete 48 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Sociology

COLLEGE OF ARTS AND SCIENCES BS CORE
 REQUIREMENTS FOR SOCIAL SCIENCE MAJORS
 See page 42 for requirement list.

SOCIOLOGY MAJOR REQUIREMENTS

Required Courses

Complete the following four courses:

SOC U101	Introduction to Sociology	4 SH
SOC U300	Social Theory	4 SH
SOC U320	Statistical Analysis in Sociology	4 SH
SOC U321	Research Methods in Sociology	4 SH

Anthropology

Complete the following course:

SOA U101	Peoples and Cultures	4 SH
----------	----------------------	------

Senior Seminar

Complete one senior seminar:

SOC U600	Senior Seminar	4 SH
or SOA U600	Senior Seminar in Cultural Anthropology	4 SH

REQUIRED SOCIOLOGY ELECTIVES

Introductory Sociology Electives

Complete four courses in the following range:

SOC U200 to SOC U299

Intermediate Sociology Electives

Complete four courses in the following range:

SOC U300 to SOC U499

Advanced Sociology Electives

Complete two courses in the following range:

SOC U500 to SOC U699

Social Science Electives

Choose six courses from the following departments:

AFR, ECN, HST, IAF, LIN, POL, or PSY.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

SOCIOLOGY MAJOR

Complete 60 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Cultural Anthropology

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

CULTURAL ANTHROPOLOGY MAJOR REQUIREMENTS

Cultural Anthropology

Complete the following three courses with a grade of C- or higher:

SOA U101	Peoples and Cultures	4 SH
SOA U300	Culture and Anthropological Methods	4 SH
SOC U101	Introduction to Sociology	4 SH

Advanced Anthropology Courses

Complete three courses with a grade of C- or higher:

SOA U500	Latin American Society and Development	4 SH
SOA U505	Native North Americans	4 SH
SOA U600 or SOC U600	Senior Seminar in Cultural Anthropology	4 SH

Anthropology Electives

Complete five courses from the following list. You may use two courses in study abroad to fulfill this requirement:

SOA U302	Sex, Sex Roles, and Family	4 SH
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SOA U305	Global Markets and Local Culture	4 SH
SOA U307	Social Movements in the Third World	4 SH
SOA U310	Individual Culture	4 SH
SOA U312	The Anthropology of Masculinity	4 SH
SOA U315	Myth and Religion	4 SH
SOA U325	War and Aggression	4 SH
SOA U365	Sport, Culture, and Society	4 SH
SOA U412	Language and Culture	4 SH
SOA U550	Culture and Survival	4 SH

Social Science Elective

Complete four social science courses from the following departments: AFR, ECN, HST, IAF, LIN, POL, or PSY.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

CULTURAL ANTHROPOLOGY MAJOR

Complete 52 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Cultural Anthropology

COLLEGE OF ARTS AND SCIENCES BS CORE

REQUIREMENTS FOR SOCIAL SCIENCE MAJORS

See page 42 for requirement list.

CULTURAL ANTHROPOLOGY MAJOR REQUIREMENTS

Cultural Anthropology

Complete the following three courses with a grade of C- or higher:

SOA U101	Peoples and Cultures	4 SH
SOA U300	Culture and Anthropological Methods	4 SH
SOC U101	Introduction to Sociology	4 SH

Advanced Anthropology Courses

Complete three courses with a grade of C- or higher:

SOA U500	Latin American Society and Development	4 SH
SOA U505	Native North Americans	4 SH
SOA U600 or SOC U600	Senior Seminar in Cultural Anthropology	4 SH

Anthropology Electives

Complete five courses from the following list. You may use two courses in study abroad to fulfill this requirement:

SOA U302	Sex, Sex Roles, and Family	4 SH
SOA U305	Global Markets and Local Culture	4 SH
SOA U307	Social Movements in the Third World	4 SH
SOA U310	Individual Culture	4 SH
SOA U312	The Anthropology of Masculinity	4 SH

SOA U315	Myth and Religion	4 SH
SOA U325	War and Aggression	4 SH
SOA U365	Sport, Culture, and Society	4 SH
SOA U412	Language and Culture	4 SH
SOA U550	Culture and Survival	4 SH

Social Science Elective

Complete six social science courses from the following departments: AFR, ECN, HST, IAF, LIN, POL, or PSY.

Additional Anthropology Electives

Choose four courses from the sociology and cultural anthropology department.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see adviser for approved courses.

CULTURAL ANTHROPOLOGY MAJOR

Complete 52 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Sociology**REQUIRED COURSES**

Complete two courses.

SOC U101	Introduction to Sociology	4 SH
SOC U300	Social Theory	4 SH
or SOC U321	Research Methods in Sociology	4 SH

REQUIRED ELECTIVE

Choose one course from the following list:

SOC U200 to SOC U699

INTERMEDIATE ELECTIVE

Choose two courses from the following list:

SOC U300 to SOC U699

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Cultural Anthropology**REQUIRED COURSES**

Complete the following two courses:

SOA U101	Peoples and Cultures	4 SH
SOA U300	Culture and Anthropological Methods	4 SH
or SOC U321	Research Methods in Sociology	4 SH

INTERMEDIATE ELECTIVE

Choose two courses from the following list:

SOA U300 to SOA U699

ADVANCED ELECTIVE

Choose one course from the following list:

SOA U500 to SOA U699

GPA REQUIREMENTS

2.000 GPA required in the minor

THEATRE

JANET BOBCEAN, MFA

Associate Professor and Chair

ASSOCIATE PROFESSORS

Nancy Kindelan, PhD

Del Lewis, MFA

CLINICAL LECTURER

Theodore D. Janello, MA

ASSISTANT ACADEMIC SPECIALIST

Zeynep D. Bakkal, MFA

LECTURER

Leslie J. Pasternack, MA

The study of theatre—as performance, visual expression, text, theory, and history—at Northeastern University balances production theory and practice. In the theatre production laboratory, students (majors and nonmajors) are involved in experiential learning that synthesizes the ideas, theories, and practices studied in the classroom. All theatre majors participate in laboratory and public performances.

A theatre major may petition to enter one of three concentrations: performance, production, or generalist. Opportunities exist for independent projects, internships, and co-op experiences.

Theatre majors may pursue advanced study in graduate or professional programs, careers as theatre practitioners, or careers in theatre education. See pages 395–398 for course descriptions.

BA in Theatre**COLLEGE OF ARTS AND SCIENCES****BA CORE REQUIREMENTS**

See page 40 for requirement list.

THEATRE MAJOR REQUIREMENTS

Theatre Background and History

Complete the following two courses:

THE U101	Theatre Arts	4 SH
THE U300	Theatre History	4 SH

Onstage

Complete the following three courses:

THE U120	Acting 1	4 SH
THE U325	Script Analysis for the Stage	4 SH
THE U550	Concepts of Directing	4 SH

Backstage

Complete the following two courses:

THE U131	Technical Theatre 1	4 SH
THE U270	Theatrical Design	4 SH

Practicum

Complete the following three courses:

THE U901	Theatre Practicum 1	1 SH
THE U902	Theatre Practicum 2	1 SH
THE U903	Theatre Practicum 3	1 SH

History/Literature/Criticism

Choose three courses from the following list:

THE U210	Theatre and Society	4 SH
THE U315	Theatre through the Lens of Modernism	4 SH
THE U500	Dramatic Theory/Criticism	4 SH
ENG U611	Shakespeare	4 SH

Rehearsal and Performance

Complete the following (repeatable) course twice:

THE U701	Rehearsal and Performance	4 SH
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THEATRE CONCENTRATION

Complete a concentration in one of the two areas or complete three electives.

Performance Concentration

Complete the following three courses:

THE U250	Voice and Movement for Theatre	4 SH
THE U342	Acting 2	4 SH
THE U343	Acting 3	4 SH

Production Concentration

Complete the following course:

THE U365	Technical Theatre 2	4 SH
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and two other courses from the following list:

THE U370	Lighting Design for the Stage	4 SH
THE U380	Costume Design	4 SH
THE U385	Pattern Drafting and Costume Construction	4 SH

THE U460	Scenic Design for the Stage	4 SH
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THE U465	Theatrical Drafting	4 SH
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Theatre Generalist Electives

Complete three intermediate or advanced theatre courses:

THE U300 to THE U699

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

THEATRE MAJOR

Complete 63 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Theatre**COLLEGE OF ARTS AND SCIENCES BS CORE****REQUIREMENTS FOR ARTS/HUMANITIES MAJORS**

See page 41 for requirement list.

THEATRE MAJOR REQUIREMENTS**Theatre Background and History**

Complete the following two courses:

THE U101	Theatre Arts	4 SH
THE U300	Theatre History	4 SH

Onstage

Complete the following three courses:

THE U120	Acting 1	4 SH
THE U325	Script Analysis for the Stage	4 SH
THE U550	Concepts of Directing	4 SH

Backstage

Complete the following two courses:

THE U131	Technical Theatre 1	4 SH
THE U270	Theatrical Design	4 SH

Practicum

Complete the following three courses:

THE U901	Theatre Practicum 1	1 SH
THE U902	Theatre Practicum 2	1 SH
THE U903	Theatre Practicum 3	1 SH

History/Literature/Criticism

Choose three courses from the following list:

THE U210	Theatre and Society	4 SH
THE U315	Theatre through the Lens of Modernism	4 SH
THE U500	Dramatic Theory/Criticism	4 SH
ENG U611	Shakespeare	4 SH

Rehearsal and Performance

Complete the following (repeatable) course twice:

THE U701	Rehearsal and Performance	4 SH
----------	---------------------------	------

THEATRE CONCENTRATION

Complete a concentration in one of the two areas or complete three electives:

Performance Concentration

Complete the following three courses:

THE U250	Voice and Movement for Theatre	4 SH
THE U342	Acting 2	4 SH
THE U343	Acting 3	4 SH

Production Concentration

Complete the following course:

THE U365	Technical Theatre 2	4 SH
----------	---------------------	------

and two other courses from the following list:

THE U370	Lighting Design for the Stage	4 SH
THE U380	Costume Design	4 SH

THE U385 Pattern Drafting and Costume Construction 4 SH

THE U460 Scenic Design for the Stage 4 SH

THE U465 Theatrical Drafting 4 SH

Theatre Generalist Electives

Complete three intermediate or advanced theatre courses:
THE U300 to THE U699

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

THEATRE MAJOR

Complete 63 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Cinema Studies and Theatre

See page 61.

BS in Cinema Studies and Theatre

See page 61.

Minor in Theatre

REQUIRED COURSES

Complete the following five courses:

THE U101 Theatre Arts 4 SH

THE U120 Acting 1 4 SH

THE U131 Technical Theatre 1 4 SH

THE U210 Theatre and Society 4 SH

THE U701 Rehearsal and Performance 4 SH

ELECTIVE COURSE

Choose one of the following courses:

THE U270 Theatrical Design 4 SH

THE U300 Theatre History 4 SH

THE U325 Script Analysis for the Stage 4 SH

THE U342 Acting 2 4 SH

THEATRE PRACTICUM

Complete the following course:

THE U901 Theatre Practicum 1 1 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

VISUAL ARTS

PAUL S. STERNBERGER, PhD

Chair

ASSOCIATE PROFESSORS

Edwin C. Andrews, MFA

Mira Cantor, MFA

Julie M. Curtis, MFA

T. Neal Rantoul, MFA

Thomas Starr, MFA

ASSISTANT PROFESSOR

Maria Isabel Meirelles, MFA

Philip H. Walsh, PhD

ACADEMIC SPECIALIST

Ann McDonald, MFA

TECHNICAL DIRECTOR AND CLINICAL LECTURER

Cynthia Baron, MBA

LECTURERS

John Kane, BA

Lindsay Leard, PhD

Robert W. Millard, MFA

Andrea Raynor, MFA

Mary Sherman, MFA

TECHNICAL STAFF

Bruce Hamilton, BA

Mary Hughes, MFA

COOPERATIVE EDUCATION SPECIALIST

Ann M. Galligan, EdD

The visual arts are our oldest form of artistic expression. Today, the ability to understand and use visual language is an essential part of the contemporary world.

The Department of Visual Arts provides students with an introduction to the theory and practice of visual language through course work in the history of the field and through creative activities. Courses are available across the spectrum of the visual arts including art history, painting and drawing, photography, animation, and graphic design. Specific courses are listed and described in another section of this catalog. Cooperative education placements for Department of Visual Arts students include positions in graphic design firms, photography labs and studios, museums, libraries, historical collections, and archives.

The city of Boston, with its superb museums, galleries, cinemas, and public library, is a primary resource for the department. Students are encouraged to take advantage of these resources, and many of the courses meet regularly in the Museum of Fine Arts in Boston. In addition, many of Boston's leading artists, photographers, and designers serve as adjunct instructors in the department's studio courses.

The Department of Visual Arts offers two majors: art and graphic design. Within the art major, students may concentrate in one of three areas: general art, photography, and animation. Majors are also eligible to apply for the department's dual major in multimedia studies. The department also offers a number of minor courses of instruction, the details of which are listed below.

Portfolio and Nonportfolio Admission

Students are accepted into the Department of Visual Arts through the normal admissions process, and may apply either with a portfolio or without a portfolio. The following details are provided to assist students with the admissions application.

Admission to the graphic design major or to the art major with concentrations in photography and/or animation requires submission of a portfolio with the application. The portfolio will be reviewed by a committee of faculty members beginning in February of each year. The portfolio should include the following four items:

- fifteen slides of original artwork presented in an 8" x 11" slide sheet. Slides should be consecutively numbered with the student's name on each. The top of the slide should be indicated by an arrow. The portfolio may include work in a variety of media; no particular subject matter or style is required. Rather, students should select work that best shows their personal style, skills, creativity, and commitment to innovation.
- a separate, typed sheet indicating name, address, telephone number, and Social Security number. On the same sheet, using the numbers from the slides, indicate title of work, date completed, dimensions, and media used.
- a separate, typed one-page artist's statement, describing the student's artwork, background interests, goals, artistic influences, and any other information.
- a self-addressed, stamped envelope for the return of slides.

Applicants without portfolios are encouraged to apply and may be accepted into the department on a first-year probationary basis as art majors. Final acceptance of probationary students into the art major, graphic design major, photo concentration, or animation concentration is dependent upon a review of the applicants' grades and a portfolio of work created during the freshman year. Students will be aided in the development of this portfolio through first-year course work. Students applying without a portfolio will be otherwise considered for admission to the department using the same admission criteria as applicants with a portfolio.

A student who has met the grade-point requirement (2.500 GPA) and who has a portfolio, but who is not accepted into the graphic design major, photography concentration, or animation concentration, has the option to remain in the department as an art major in general art.

Internal Transfer into the Department of Visual Arts
Students already enrolled at the University may apply to transfer into the Department of Visual Arts. Students wishing to transfer should do the following:

- complete four art courses with a grade in each course of B or above (two of the courses must be studio courses).
- complete a petition to transfer and submit it to the chair or head adviser of the department.
- submit a transcript (minimum requirement for internal transfer is a 3.000 overall GPA).
- present a portfolio of artwork following the instructions given above for new students.

All materials should be brought to Room 239 of Ryder Hall. For further information regarding admission to the department, consult our Web site: www.art.neu.edu.

BA in Art

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

ART MAJOR REQUIREMENTS

Art History

Complete the following two courses:

ART U101	History of Art before 1400	4 SH
ART U103	History of Art since 1400	4 SH

Foundation Skills

Complete four courses:

ART U124	Basic Drawing	4 SH
ART U130	Visual Studies Foundation 1	4 SH
ART U131	Visual Studies Foundation 2	4 SH
ART U160	Photography 1	4 SH
or ART U180	Video Basics	4 SH

GENERAL ART TRACK

Capstone

Complete the following course:

ART U685	Interarts	4 SH
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Art Electives

Complete six courses within the art department.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ART MAJOR—GENERAL ART

Complete 52 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Art

COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR ARTS/HUMANITIES MAJORS

See page 41 for requirement list.

ART MAJOR REQUIREMENTS

Art History

Complete the following two courses:

ART U101 History of Art before 1400 4 SH

ART U103 History of Art since 1400 4 SH

Foundation Skills

Complete four courses:

ART U124 Basic Drawing 4 SH

ART U130 Visual Studies Foundation 1 4 SH

ART U131 Visual Studies Foundation 2 4 SH

ART U160 Photography 1 4 SH

or ART U180 Video Basics 4 SH

GENERAL ART TRACK

Capstone

Complete the following course:

ART U685 Interarts 4 SH

Art Electives

Complete six courses within the art department.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ART MAJOR—GENERAL ART

Complete 52 semester hours for the major.

UPPER-DIVISION ELECTIVES

Complete three courses at the 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Art with Concentration in Animation

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

ART MAJOR REQUIREMENTS

Art History

Complete the following two courses:

ART U101 History of Art before 1400 4 SH

ART U103 History of Art since 1400 4 SH

Foundation Skills

Complete four courses:

ART U124 Basic Drawing 4 SH

ART U130 Visual Studies Foundation 1 4 SH

ART U131 Visual Studies Foundation 2 4 SH

ART U160 Photography 1 4 SH

or ART U180 Video Basics 4 SH

ANIMATION CONCENTRATION

Twentieth-Century Art

Complete the following course:

ART U313 Twentieth-Century Art 4 SH

Digital Tools

Complete the following course:

ART U290 Introduction to Digital Tools 4 SH

Animation

Complete the following five courses:

ART U175 Animation Basics 4 SH

ART U275 Animation Studio 1 4 SH

ART U375 Animation Studio 2 4 SH

ART U475 Animation Studio 3 4 SH

ART U575 Animation Studio 4 4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ART MAJOR—ANIMATION

Complete 52 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Art with Concentration in Animation

COLLEGE OF ARTS AND SCIENCES BS CORE

REQUIREMENTS FOR ARTS/HUMANITIES MAJORS

See page 41 for requirement list.

ART MAJOR REQUIREMENTS

Art History

Complete the following two courses:

ART U101	History of Art before 1400	4 SH
ART U103	History of Art since 1400	4 SH

Foundation Skills

Complete four courses:

ART U124	Basic Drawing	4 SH
ART U130	Visual Studies Foundation 1	4 SH
ART U131	Visual Studies Foundation 2	4 SH
ART U160	Photography 1	4 SH
or ART U180	Video Basics	4 SH

ANIMATION CONCENTRATION

Twentieth-Century Art

Complete the following course:

ART U313	Twentieth-Century Art	4 SH
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Digital Tools

Complete the following course:

ART U290	Introduction to Digital Tools	4 SH
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Animation

Complete the following five courses:

ART U175	Animation Basics	4 SH
ART U275	Animation Studio 1	4 SH
ART U375	Animation Studio 2	4 SH
ART U475	Animation Studio 3	4 SH
ART U575	Animation Studio 4	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ART MAJOR—ANIMATION

Complete 52 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three courses at the 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BA in Art with Concentration in Photography

COLLEGE OF ARTS AND SCIENCES

BA CORE REQUIREMENTS

See page 40 for requirement list.

ART MAJOR REQUIREMENTS

Art History

Complete the following two courses:

ART U101	History of Art before 1400	4 SH
ART U103	History of Art since 1400	4 SH

Foundation Skills

Complete four courses:

ART U124	Basic Drawing	4 SH
ART U130	Visual Studies Foundation 1	4 SH
ART U131	Visual Studies Foundation 2	4 SH
ART U160	Photography 1	4 SH
or ART U180	Video Basics	4 SH

PHOTOGRAPHY CONCENTRATION

History of Photography

Complete the following course:

ART U330	History of Photography	4 SH
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Photography

Complete the following two courses:

ART U160	Photography 1	4 SH
ART U360	Photography 2	4 SH

Digital Tools

Complete the following four courses:

ART U290	Introduction to Digital Tools	4 SH
ART U385	Still Digital Imaging	4 SH
ART U601	Alternative Analog and Digital Processes	4 SH
ART U602	Fine Art Digital Imaging	4 SH

Degree Projects

Complete the following two courses:

ART U710	Senior Project in Photography 1	6 SH
ART U711	Senior Project in Photography 2	6 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ART MAJOR—PHOTOGRAPHY

Complete 60 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Art with Concentration in Photography

COLLEGE OF ARTS AND SCIENCES BS CORE

REQUIREMENTS FOR ARTS/HUMANITIES MAJORS

See page 41 for requirement list.

ART MAJOR REQUIREMENTS

Art History

Complete the following two courses:

ART U101	History of Art before 1400	4 SH
ART U103	History of Art since 1400	4 SH

Foundation Skills

Complete four courses:

ART U124	Basic Drawing	4 SH
ART U130	Visual Studies Foundation 1	4 SH
ART U131	Visual Studies Foundation 2	4 SH
ART U160	Photography 1	4 SH
or ART U180	Video Basics	4 SH

PHOTOGRAPHY CONCENTRATION**History of Photography**

Complete the following course:

ART U330	History of Photography	4 SH
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Photography

Complete the following two courses:

ART U160	Photography 1	4 SH
ART U360	Photography 2	4 SH

Digital Tools

Complete the following four courses:

ART U290	Introduction to Digital Tools	4 SH
ART U385	Still Digital Imaging	4 SH
ART U601	Alternative Analog and Digital Processes	4 SH
ART U602	Fine Art Digital Imaging	4 SH

Degree Projects

Complete the following two courses:

ART U710	Senior Project in Photography 1	6 SH
ART U711	Senior Project in Photography 2	6 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

ART MAJOR—PHOTOGRAPHY

Complete 60 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

BS in Graphic Design**COLLEGE OF ARTS AND SCIENCES BS CORE****REQUIREMENTS FOR ARTS/HUMANITIES MAJORS**

See page 41 for requirement list.

GRAPHIC DESIGN MAJOR REQUIREMENTS**Art History**

Complete the following four courses:

ART U101	History of Art before 1400	4 SH
ART U103	History of Art since 1400	4 SH
ART U240	History of Graphic Design	4 SH
ART U313	Twentieth-Century Art	4 SH

Foundation Skills

Complete the following five courses:

ART U130	Visual Studies Foundation 1	4 SH
ART U131	Visual Studies Foundation 2	4 SH
ART U160	Photography 1	4 SH
ART U180	Video Basics	4 SH
ART U290	Introduction to Digital Tools	4 SH

Design/Drawing

Complete the following seven courses:

ART U332	Design Principles and Drawing	4 SH
ART U333	Design 1 and Drawing	4 SH
ART U443	Graphic Design 2	4 SH
ART U630	Degree Project in Design	4 SH
ART U635	Time-Based Design	4 SH
ART U644	Interactive Design	4 SH
ART U691	Information Architecture	4 SH

Typography

Complete the following two courses:

ART U334	Typography 1	4 SH
ART U344	Typography 2	4 SH

Color in Multiple Media

Complete the following course:

ART U350	Color in Multiple Media	4 SH
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GRAPHIC DESIGN MAJOR ELECTIVES**Art History/Film Elective**

Complete one course from the following list:

ART U330	History of Photography	4 SH
ART U336	American Film	4 SH
ART U337	Contemporary Directions in Cinema	4 SH
CIN U150	Film Analysis	4 SH
CIN U350	Film Theory	4 SH
CIN U390	Film and Psychoanalysis	4 SH
CIN U500	Modernism/Modernity and Film	4 SH
ENG U391	Topics in Film	4 SH
ENG U488	Film and Text	4 SH
ENG U489	Shakespeare on Film	4 SH
HST U421	History through Film	4 SH
INT U120	Exploring Humanities through Film	4 SH
INT U460	Jewish Film	4 SH
LNC U255	Chinese Film: Gender and Ethnicity	4 SH
LNF U280	French Film and Culture	4 SH
LNG U270	Modern German Film and Literature	4 SH
LNJ U260	Japanese Film	4 SH
LNR U386	History of Soviet Cinema	4 SH
MMS U500	Multimedia Studies History	4 SH

Art/Design Elective

Complete one art course.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

GRAPHIC DESIGN MAJOR

Complete 84 semester hours for the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Art**REQUIRED COURSES**

Complete the following three courses:

ART U101	History of Art before 1400	4 SH
or ART U103	History of Art since 1400	4 SH
ART U124	Basic Drawing	4 SH
ART U130	Visual Studies Foundation 1	4 SH

ELECTIVE COURSES

Choose two courses from the following list:

ART U127	Basic Painting	4 SH
ART U310	Nineteenth-Century Art	4 SH
ART U313	Twentieth-Century Art	4 SH
ART U354	Figure Drawing	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Animation**REQUIRED COURSES**

Complete the following five courses:

ART U175	Animation Basics	4 SH
ART U275	Animation Studio 1	4 SH
ART U375	Animation Studio 2	4 SH
ART U475	Animation Studio 3	4 SH
ART U575	Animation Studio 4	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Graphic Design**REQUIRED COURSES**

Complete the following four courses:

ART U332	Design Principles and Drawing	4 SH
ART U333	Design 1 and Drawing	4 SH
ART U334	Typography 1	4 SH
ART U350	Color in Multiple Media	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Photography**REQUIRED COURSES**

Complete the following four courses:

ART U160	Photography 1	4 SH
ART U330	History of Photography	4 SH
ART U360	Photography 2	4 SH
ART U385	Still Digital Imaging	4 SH

ELECTIVE COURSES

Choose one course from the following list:

ART U601	Alternative Analog and Digital Processes	4 SH
ART U602	Fine Art Digital Imaging	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Bouvé College of Health Sciences

STEPHEN R. ZOLOTH, PhD, MPH, *Dean*

Christine Letzeiser, MS, RN, *Assistant Dean of First-Year Services and Enrollment*

Jessica L. Ley, EdM, *Academic Counselor*

William J. Purnell, *Director of Graduate Admissions*

Margaret K. Schnabel, *Director of Graduate Student Services*

Cynthia Seltzer, MA, *Academic Counselor*

Anne M. Sullivan, MEd, *Assistant Dean for Administrative Affairs*

Ena Vazquez-Nuttall, EdD, *Associate Dean and Director of the Graduate School*

Nancy P. Warner, MS, *Associate Director, Office of Student Services*

Esther B. Williams, *Freshman Counselor*

The programs in Bouvé College of Health Sciences combine cooperative education experiences with highly innovative academic curricula that are designed to meet the demand for well-educated allied health professionals, nurses, and pharmacists. The college prepares students to become effective professional practitioners, enter graduate schools, and work in many areas responsible for the delivery of health care.

There are three schools within the Bouvé College of Health Sciences: the School of Health Professions, the School of Nursing, and the School of Pharmacy. The college offers students a health-care education that features a curriculum of highly relevant and closely integrated basic courses in the physical, biological, behavioral, and administrative sciences; on-site involvement in clinical patient care, including early and advanced pharmacy practice experiences and clinical affiliations in nursing, physical therapy, and other health professions; a cooperative education work program; and a commitment to the search for and advancement of new and progressive concepts, ideas, and philosophies of education and professional practice.

Each of the programs offered by the college is accredited by the appropriate professional group. The college is a member of the Association of Schools of Allied Health Professions, the American Association of Colleges of Nursing, and the American Association of Colleges of Pharmacy.

Academic Requirements

Students must receive a grade of C or better in professional courses.

Professional courses:

Courses taught within the major/college as identified by unit/faculty: ATP, BHS, CES, MLS, NUR, PTH, SLA, TOX, PMD, PSC

Nursing—All NUR courses including the following interdisciplinary courses: BHS U105, Nutrition, BHS U450, Research, and PCS U340, Pharmacology

Students must receive a grade of C- or better in selected professional prerequisites.

Professional prerequisites:

All courses, including sciences, essential, content, and prerequisite courses, as determined by unit faculty. Laboratory sections may be treated separately from lecture.

Athletic Training: BIO, CHM, PHY

Cardiopulmonary and Exercise Sciences: BIO, CHM, PHY, PSC
Medical Laboratory Science: BIO, CHM, PHY
Nursing: MTH U115, BIO, CHM
Pharmacy: BIO, CHM, PHY, MTH
Physical Therapy: BIO, CHM, MTH, PHY
Speech-Language Pathology and Audiology: BIO, MTH, PSY U101

For all other courses:

The University's minimum passing grade for the course will be accepted.

Academic Standing

Freshmen must have an overall GPA greater than or equal to 1.800 and earn at least 12 semester hours in the semester just completed in order to maintain good academic standing.

Upperclass students must have an overall GPA greater than or equal to 2.000 and earn at least 12 semester hours in the semester just completed in order to maintain good academic standing.

Status	Freshman	Upperclass
Probation	1. GPA of less than 1.800	1. GPA of less than 2.000
Probation Extended	1. GPA of less than 1.800 for any two consecutive semesters	1. GPA of less than 2.000 for any two consecutive semesters
Dismissal from Program	1. GPA of less than 1.800 after completion of summer remedial work or 2. Failure to receive passing grade in the same course twice	1. Failure to bring GPA above 2.000 after two semesters of probation or 2. Three failures in professional courses regardless of remediation or 3. Failure to pass the same course twice

Academic Progression

In order to progress from freshman to sophomore year, the student must have a GPA greater than 1.800, have completed 27 semester hours, and have successfully repeated any deficient courses. In order to progress into the subsequent year of professional courses, the student must have passed all professional prerequisites (as determined by the department) with a grade of C- or better. Students are responsible for following the curriculum plan based on their assigned major, cooperative education division, and year of graduation. Students have a responsibility for monitoring their own progress through the curriculum by registering for the proper courses, knowing the course prerequisites, and knowing the sanctions for unsatisfactory academic progress.

Special Requirements

Cooperative education is a required component for all Bouvé programs unless otherwise noted.

Graduation Requirements

The college reserves the right to amend programs, courses, and degree requirements to fulfill its educational responsibility to respond to relevant changes in the field. Students must complete all of the requirements in the degree program in which they are candidates. Degree requirements are based on the year of graduation, determined by the date of entry or reentry into the college. Degree requirements and the year of graduation for a degree candidate who fails to make normal academic progress will be subject to review and possible change.

Pathways Program

The Pathways Program is designed for students who are undecided about a profession but are interested in a career in health care. The program offers freshmen a core of courses designed to provide the basic scientific background for many of the professional programs in the college.

Satisfactory completion of all freshman-year courses, including the Pathways core curriculum, is necessary for admission, on a space-available basis, to one of the professional programs of the college.

Transfer Credit

The college may accept qualified transfer students who have successfully completed course work in an accredited college or university. No student transferring from another college or university may receive a degree unless 32 of the last 40 semester hours of academic work immediately preceding graduation have been completed at Northeastern.

SCHOOL OF HEALTH PROFESSIONS

MARY E. WATSON, EdD, RRT
Dean of the School and Associate Dean of the College

ATHLETIC TRAINING

JAMIE L. MUSLER, MS, ATC
Program Director and Assistant Clinical Specialist

ASSOCIATE PROFESSOR
 Chad Starkey, PhD

ASSISTANT PROFESSOR
 Andrew Krause, PhD

COORDINATOR OF CLINICAL EDUCATION
 Kimberly Ashton Wise, MS

The five-year athletic training education program is designed for students who are interested in an allied health-care profes-

sion specializing in the health care of the physically active. Working under a physician's supervision, athletic trainers are members of the sports medicine field who specialize in the prevention, evaluation, management, treatment, and rehabilitation of injuries to a physically active population. Athletic trainers function as integral members of the health-care team in secondary schools, colleges and universities, professional sports programs, sports medicine clinics, hospitals, corporate and industrial settings, and other health-care facilities.

Students may apply from high school or apply for transfer into the athletic training education program after successfully completing their first year of academic study. To be accepted into the program, transfer applicants must demonstrate an established academic record with a solid foundation in the sciences. In addition, the athletic training education program has minimum physical, emotional, and cognitive skill requirements considered necessary for all students admitted to the program. These requirements are outlined in the Technical Standards that can be found on the program Web site and from the program office. Candidates for selection to the athletic training education program will be required to verify they understand and meet these Technical Standards or that they believe, with certain accommodations, they can meet the standards. It is the sole responsibility of the student to notify the Disability Resource Center if they feel accommodations are needed.

Students in the program take courses designed to develop competencies in the following domains: risk management and injury prevention, pathology of injuries and illnesses, assessment and evaluation, acute care of injury and illness, pharmacology, therapeutic modalities, therapeutic exercise, general medical conditions and disabilities, nutritional aspects of injury and illness, psychosocial intervention and referral, health-care administration, and professional development and responsibilities. The athletic training education program is committed to the advancement of scholarship by implementing evidence-based practice into didactic, clinical, and cooperative education. In addition, students are required to fulfill clinical education requirements in four structured clinical affiliations during academic semesters. These affiliations may include Northeastern University, other colleges, universities, and high schools as well as clinics and medical facilities in the Boston area. To progress in the program, students must maintain acceptable standards of scholarship, academic performance, and psychomotor development as outlined in this catalog and the student handbook.

The program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). Students who graduate from the athletic training education program are eligible to sit for the National Athletic Trainers' Association Board Certification Examination and may be eligible for state licensure in those states that require licensure for athletic trainers. See pages 209–210 for course descriptions.

BS in Athletic Training

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C is required in both courses.

DIVERSITY

Complete SOA U101 or one course from the list "Approved Courses: Diversity" on page 44.

ATHLETIC TRAINING GENERAL EDUCATION REQUIREMENTS

Mathematics

Complete the following course:

MTH U121 Precalculus 4 SH

Anatomy and Physiology

Complete the following two courses with corresponding labs:

BIO U117 Integrated Anatomy and Physiology 1 4 SH

with BIO U118 Lab for BIO U117 1 SH

BIO U119 Integrated Anatomy and Physiology 2 4 SH

with BIO U120 Lab for BIO U119 1 SH

Chemistry

Complete the following course with corresponding lab:

CHM U101 General Chemistry for Health Sciences 5 SH

Physics

Complete the following course with corresponding lab:

PHY U145 Physics for Life Sciences 1 5 SH

Psychology Course

Complete the following course:

PSY U101 Foundations of Psychology 4 SH

ATHLETIC TRAINING REQUIREMENTS

Introductory Courses

Complete the following two courses with corresponding lab:

ATP U105 Athletic Health-Care Overview 3 SH

ATP U120 Clinical Practice Skills in Athletic

Training

with ATP U121 Lab for ATP U120 1 SH

Intermediate Courses

Complete the following three courses with corresponding labs:

ATP U310 Therapeutic Modalities 3 SH

with ATP U311 Lab for ATP U310 1 SH

ATP U320 Therapeutic Exercise 3 SH

with ATP U321 Lab for ATP U320 1 SH

ATP U330 Neuromuscular and Cardiovascular

Programming 2 SH

Advanced Courses

Complete the following five courses with corresponding labs:

ATP U500 Evaluation: Lower Extremity 4 SH

with ATP U501 Evaluation: Lower Extremity Skills Lab 1 SH

and ATP U502 Evaluation: Lower Extremity 1 SH

Anatomy Lab

ATP U510	Evaluation: Upper Extremity	4 SH
with ATP U511	Evaluation: Upper Extremity Skills Lab	1 SH
and ATP U512	Evaluation: Upper Extremity Anatomy Lab	1 SH
ATP U520	Evaluation: Head and Spine	4 SH
with ATP U521	Evaluation: Head and Spine Skills Lab	1 SH
and ATP U522	Evaluation: Head and Spine Anatomy Lab	1 SH
ATP U530	Disease and Disabilities in Athletics	3 SH
with ATP U531	Lab for ATP U530	1 SH
ATP U600	Administration in Athletic Health Care	4 SH

Clinical and Field Work

Complete the following five courses:

ATP U941	Athletic Training Clinical Affiliation 1	3 SH
ATP U942	Athletic Training Clinical Affiliation 2	3 SH
ATP U943	Athletic Training Clinical Affiliation 3	3 SH
ATP U944	Athletic Training Clinical Affiliation 4	3 SH
ATP U946	Athletic Training Senior Experience	2 SH

Additional Bouvé Course Work

Complete the following six courses and one corresponding lab:

BHS U105	Nutrition	4 SH
CAP U502	Health Counseling	3 SH
CES U400	Statistics and Research Design	4 SH
CES U500	Exercise Physiology 1	4 SH
with CES U501	Lab for CES U500	1 SH
CES U504	Clinical Kinesiology	4 SH
PSC U340	Pharmacology for the Health Professions	4 SH

GRADE REQUIREMENTS

A grade of C or higher is required in all ATP and science courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

CARDIOPULMONARY AND EXERCISE SCIENCES

WILLIAM J. GILLESPIE, EdD
Associate Professor and Chair

PROFESSOR

Thomas A. Barnes, EdD, RRT

ASSOCIATE PROFESSORS

Marilyn A. Cairns, ScD
Carol Ewing Garber, PhD
Patrick F. Plunkett, EdD, RRT
Mary E. Watson, EdD, RRT

ASSOCIATE CLINICAL SPECIALISTS

Eric B. Pepin, EdD, CCP
Scott A. Stanley, MS, RRT
Annemarie Sullivan, MS

The Department of Cardiopulmonary and Exercise Sciences offers both five-year co-op and four-year non-co-op Bachelor of Science (BS) degree programs in exercise physiology and respiratory therapy. In addition, the department offers a new six-year co-op and five-year non-co-op combined Bachelor of Science/Master of Science (BS/MS) degree program in clinical exercise physiology.

All programs have a common core curriculum in arts and sciences and cardiopulmonary sciences during the freshman and sophomore years. At the completion of the sophomore year, students decide on the various program options (co-op or non-co-op, BS or BS/MS in exercise physiology, or BS in respiratory therapy).

Exercise Physiology

Exercise physiologists administer exercise tests and develop, implement, and supervise exercise and health promotion programs for people to help improve their health, fitness, and functional capacity. Clinical exercise physiologists do the above, but work primarily with patients who have chronic cardiovascular, pulmonary, metabolic, and musculoskeletal diseases and disorders to help improve their health, fitness, and functional status.

All students in the program take courses in exercise physiology, exercise testing and prescription, clinical kinesiology, and health promotion and program planning. Students then choose a concentration in health and fitness, research, or clinical exercise physiology. Students in the health and fitness concentration complete a two-semester practicum sequence during their senior year in which they have internship experiences in a commercial and/or corporate health and fitness center. Students in the research concentration complete a two-semester thesis sequence during their senior year in which they complete a research project under the direction of a faculty member. Students in the clinical exercise physiology program complete graduate courses during their final two years in advanced cardiopulmonary physiology, cardiopulmonary pathophysiology, musculoskeletal pathophysiology and assessment, electrocardiography, pharmacology, advanced exercise physiology, clinical exercise testing, and exercise testing in health and disease. Students then complete twelve months or three semesters of rotations in cardiology departments performing exercise testing and in rehabilitation programs working with people with a variety of diseases and disabilities.

Students completing the BS degree program in exercise physiology with a concentration in health and fitness are eligible to sit for the American College of Sports Medicine Health/Fitness Certification. Students completing the MS degree program in clinical exercise physiology are eligible to sit for the ACSM Clinical Exercise Physiology Registry Examination.

Respiratory Therapy

Respiratory therapists are instrumental in the diagnosis, treatment, management, and preventive care of patients with cardiopulmonary problems. Patients suffering from a variety of acute or chronic disabling conditions may be found in newborn nurseries, surgical and medical units, emergency rooms, outpatient departments, and intensive-care units. Respiratory therapists are expected to assess and quantify their patients' cardiopulmonary status, to provide appropriate respiratory care by applying patient-care protocols, and to evaluate the medical benefits and cost-effectiveness of their care. Respiratory therapists have often promoted the expansion of services in their communities, such as diagnosis and treatment of sleep disorders, patient education on health promotion and disease prevention, pulmonary rehabilitation, disease-specific case management, and life support outside of the intensive-care unit. Changes in health-care policy, regulations, and reimbursements have required therapists to adopt these expanded roles, work more independently in settings across the continuum of care, and collaborate as partners on the health-care delivery team.

Respiratory therapists are involved in treating disorders such as cardiac failure, asthma, pulmonary edema, emphysema, cerebral thrombosis, drowning, hemorrhage, and shock. The respiratory therapist is a life-support specialist trained in airway management, artificial ventilation, emergency cardiac care, and other sophisticated emergency support measures.

Working under physicians' orders, respiratory therapists administer therapeutic measures. They must provide and recommend specialized care and be skilled in such areas as medical gas administration, aerosol therapy, chest physiotherapy, cardiopulmonary resuscitation, mechanical ventilation, airway management, pulmonary function studies, blood gas analysis, and hemodynamic monitoring. All students in the respiratory therapy specialization take several respiratory therapy didactic, laboratory, seminar, and clinical practice courses.

After successful completion of the program, students are eligible to take the respiratory therapy registry examination administered by the National Board for Respiratory Care. Those who pass the exam earn the designation Registered Respiratory Therapist (RRT). The program is accredited by the Commission on Accreditation of Allied Health Education Programs.

BS in Cardiopulmonary and Exercise Sciences

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

DIVERSITY

Complete SOA U101 or one course from the list "Approved Courses: Diversity" on page 44.

CES GENERAL EDUCATION REQUIREMENTS

Arts and Humanities

PSYCHOLOGY

Complete the following course:

PSY U101 Foundations of Psychology 4 SH

ETHICS

Complete the following course:

PHL U165 Moral Problems in Medicine 4 SH

HUMANITIES ELECTIVE

Complete one elective from the following departments:

ART, ASL, CMN, ENG, JRN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MUS, PHL, or THE.

Mathematics and Science

MATHEMATICS

Complete the following course:

MTH U141 Calculus 1 4 SH

ANATOMY AND PHYSIOLOGY

Complete the following two courses with corresponding labs:

BIO U117 Integrated Anatomy and Physiology 1 4 SH

with BIO U118 Lab for BIO U117 1 SH

BIO U119 Integrated Anatomy and Physiology 2 4 SH

with BIO U120 Lab for BIO U119 1 SH

CHEMISTRY

Complete the following two courses with corresponding labs:

CHM U101 General Chemistry for Health Sciences 5 SH

CHM U104 Organic Chemistry for Health Sciences 5 SH

PHYSICS

Complete the following two courses with corresponding labs:

PHY U145 Physics for Life Sciences 1 5 SH

PHY U147 Physics for Life Sciences 2 5 SH

PHARMACOLOGY

Complete the following course:

PSC U340 Pharmacology for the Health Professions 4 SH

ARTS AND SCIENCES/BOUVÉ ELECTIVES

Complete four electives in either Arts and Sciences or Bouvé.

CARDIOPULMONARY AND EXERCISE SCIENCE

Introductory Courses

Complete the following three courses:

CES U101 Cardiopulmonary and Exercise Sciences Seminar 1 1 SH

CES U201 Cardiopulmonary and Exercise Sciences Seminar 2 1 SH

CES U202 Basic Clinical Skills 3 SH

Intermediate Courses

Complete the following three courses:

CES U300 Cardiopulmonary Physiology and Pathophysiology 4 SH

CES U301 Cardiopulmonary Assessment 4 SH

CES U400 Statistics and Research Design 4 SH

CONCENTRATION

Select **RESPIRATORY THERAPY** or **EXERCISE PHYSIOLOGY**

*Respiratory Therapy***MICROBIOLOGY COURSE**

Complete the following course with corresponding lab:

BIO U121	Basic Microbiology	4 SH
with BIO U122	Lab for BIO U121	1 SH

RESPIRATORY THERAPY REQUIRED COURSES

Complete the following five courses with corresponding labs:

CES U302	Cardiopulmonary Disease	4 SH
CES U600	Fundamentals of Respiratory Therapy	4 SH
with CES U601	Lab for CES U600	1 SH
CES U602	Advanced Respiratory Therapy Practice	4 SH
with CES U603	Lab for CES U602	1 SH
CES U604	Neonatal and Pediatric Respiratory Therapy	3 SH
with CES U605	Lab for CES U604	1 SH
CES U606	Advanced Cardiovascular Life Support	3 SH

SEMINAR AND PRACTICUM IN RESPIRATORY THERAPY

Complete the following four courses:

CES U910	Clinical Seminar in Respiratory Therapy	1 SH
CES U945	Practicum in Respiratory Therapy 1	4 SH
CES U946	Practicum in Respiratory Therapy 2	6 SH
CES U947	Practicum in Respiratory Therapy 3	6 SH

*Exercise Physiology***EXERCISE PHYSIOLOGY REQUIRED COURSES**

Complete the following five courses with corresponding labs:

CES U500	Exercise Physiology 1	4 SH
with CES U501	Lab for CES U500	1 SH
CES U502	Exercise Testing and Prescription	4 SH
CES U504	Clinical Kinesiology	4 SH
CES U506	Health Promotion and Program Planning	4 SH
CES U520	Exercise Physiology 2	3 SH

THESIS OR PRACTICUM

Complete either the thesis or practicum sequence.

THESIS

CES U701	Senior Thesis in Exercise Physiology 1	6 SH
with CES U702	Senior Thesis in Exercise Physiology 2	6 SH

PRACTICUM

CES U940	Practicum in Exercise Physiology 1	6 SH
with CES U941	Practicum in Exercise Physiology 2	6 SH

CES ELECTIVE COURSE

Complete one course from the CES department.

GRADE REQUIREMENTS

A grade of C or higher is required in all CES courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

132 total semester hours required

Minimum 2.000 GPA required

BS/MS in Clinical Exercise Physiology**ENGLISH REQUIREMENT**

Complete the following course:

ENG U111	College Writing	4 SH
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and one approved Advanced Writing in the Disciplines course.

A grade of C is required in both courses.

DIVERSITY

Complete SOA U101 or one course from the list "Approved Courses: Diversity" on page 44.

CES GENERAL EDUCATION REQUIREMENTS*Arts and Humanities***PSYCHOLOGY**

Complete the following course:

PSY U101	Foundations of Psychology	4 SH
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ETHICS

Complete the following course:

PHL U165	Moral Problems in Medicine	4 SH
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HUMANITIES ELECTIVE

Complete one elective from the following departments: ART, ASL, CMN, ENG, JRN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MUS, PHL, or THE.

*Mathematics and Science***MATHEMATICS**

Complete the following course:

MTH U141	Calculus 1	4 SH
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ANATOMY AND PHYSIOLOGY

Complete the following two courses with corresponding labs:

BIO U117	Integrated Anatomy and Physiology 1	4 SH
with BIO U118	Lab for BIO U117	1 SH
BIO U119	Integrated Anatomy and Physiology 2	4 SH
with BIO U120	Lab for BIO U119	1 SH

CHEMISTRY

Complete the following two courses with corresponding labs:

CHM U101	General Chemistry for Health Sciences	5 SH
CHM U104	Organic Chemistry for Health Sciences	5 SH

PHYSICS

Complete the following two courses with corresponding labs:

PHY U145	Physics for Life Sciences 1	5 SH
PHY U147	Physics for Life Sciences 2	5 SH

PHARMACOLOGY

Complete the following course:

PSC U340	Pharmacology for the Health Professions	4 SH
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CARDIOPULMONARY AND EXERCISE SCIENCE

Introductory Courses

Complete the following three courses:

CES U101	Cardiopulmonary and Exercise Sciences Seminar 1	1 SH
CES U201	Cardiopulmonary and Exercise Sciences Seminar 2	1 SH
CES U202	Basic Clinical Skills	3 SH

Intermediate Courses

Complete the following three courses:

CES U300	Cardiopulmonary Physiology and Pathophysiology	4 SH
CES U301	Cardiopulmonary Assessment	4 SH
CES U400	Statistics and Research Design	4 SH

ARTS AND SCIENCES/BOUVÉ ELECTIVES

Complete five electives from Arts and Sciences or Bouvé.

CARDIOPULMONARY AND EXERCISE PHYSIOLOGY

Undergraduate Courses

Complete the following three courses with corresponding lab:

CES U500	Exercise Physiology 1	4 SH
with CES U501	Lab for CES U500	1 SH
CES U502	Exercise Testing and Prescription	4 SH
CES U504	Clinical Kinesiology	4 SH

Musculoskeletal

Complete the following two courses:

CES G230	Musculoskeletal Pathophysiology	3 SH
CES G231	Musculoskeletal Assessment	2 SH

Cardiopulmonary

Complete the following six courses:

CES G200	Cardiopulmonary Physiology	3 SH
CES G201	Cardiopulmonary Pathophysiology	3 SH
CES G202	Electrocardiography	3 SH
CES G203	Clinical Pharmacology	3 SH
CES G220	Exercise Physiology	3 SH
CES G221	Clinical Cardiopulmonary Exercise Testing	2 SH

Advanced Seminar

Complete the following course:

CES G222	Exercise in Health and Disease	3 SH
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Research Project

Complete the following course:

CES G263	Research Design and Methodology	3 SH
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Internship or Thesis

Complete

CES G401	Clinical Exercise Physiology Internship 1	3 SH
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and either the internship or thesis sequence.

INTERNSHIP

CES G402	Clinical Exercise Physiology Internship 2	3 SH
with CES G403	Clinical Exercise Physiology Internship 3	3 SH

THESIS

CES G691	Thesis 1	3 SH
with CES G692	Thesis 2	3 SH

GRADUATE ELECTIVES

Complete two graduate electives in CES.

GRADE REQUIREMENTS

A grade of C or higher is required in all CES courses.

GPA REQUIREMENTS

Minimum 3.000 GPA required for all graduate courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

156 total semester hours required

Minimum 2.000 GPA required

MEDICAL LABORATORY SCIENCE

MARY LOUISE TURGEON, EDD, MT(ASCP), CLS(NCA)

Acting Chair

PROGRAM DIRECTOR AND SENIOR CLINICAL SPECIALIST

Barbara E. Martin, MHP, MT(ASCP)

ASSOCIATE PROFESSORS

Judith T. Barr, ScD

Britta L. Karlsson, MS, MT(ASCP)

LECTURERS

Tenin Aburto, PhD, MT(ASCP)

Paul Breitenbecher, BS, MT(ASCP)Sc

Anna Demarinis, MA, MT(ASCP)SBB

Elizabeth Szymczak, MS, MT(ASCP)

Patricia Wright, BA, MT(ASCP)SBB

LABORATORY COORDINATOR

Judith Baronas, BS, MT(ASCP)

TEACHING ASSISTANT

April Bobenchik, BS, MT(ASCP)

The Department of Medical Laboratory Science prepares professionals in the laboratory disciplines of clinical chemistry, hematology, immunochemistry, immunology, and microbiology. Medical laboratory scientists (medical technologists) perform diagnostic test procedures using state-of-the-art computerized analyzers. They are responsible for overseeing patient specimen collection, and for test accuracy, cost-effectiveness, and efficiency in reporting results to physicians. Physicians rely on laboratory tests to establish a diagnosis and to determine therapy. Traditionally the program has prepared

students for positions in health-care delivery, but, through cooperative education experiences, it also offers students the opportunity to explore positions in biological, chemical, and medical research, the biotechnology industry, and governmental agencies. Many graduates enter responsible positions in these areas. The curriculum also provides excellent preparation for advanced studies in graduate and professional schools.

The five-year program leads to a Bachelor of Science degree. Students begin the experiential learning phase of the program during their sophomore year, with cooperative education placements in regional institutions. Upperclass students have the opportunity for international placements. Recently students have had co-ops in Sweden and the United Kingdom. In their senior year students receive formal clinical training at some of metropolitan Boston's finest health-care facilities. To enter clinical training, students must complete all prerequisite courses and maintain an acceptable grade-point average. Graduates of the Bachelor of Science program are eligible for national certification examinations as medical technologists and clinical laboratory scientists. Some states require additional licensure examinations. See pages 335–338 for course listings.

Minor Curriculum

This minor provides students majoring in other science fields an opportunity to explore the principles of the biological and chemical sciences as applied in the medical laboratory. Students may specialize in one of the five categorical areas of medical laboratory science: clinical chemistry, hematology, immunology, immunohematology, or microbiology.

Postbaccalaureate Certificate Program

The postbaccalaureate certificate program in medical laboratory science enables students with a baccalaureate degree and sufficient background in the biological and chemical sciences to become eligible for certification in clinical microbiology, clinical chemistry, hematology, immunohematology, or immunology. Depending upon the specialty, students must complete 24–26 semester hours of professional course work, which must include applied study at an affiliated clinical site. After completing the program, students may be eligible for the national certification examination in a categorical area. Completion requires twelve to twenty-four months of part-time study depending on prerequisite course work, specialty chosen, and the timing of a student's entry into the program.

BS in Medical Laboratory Science

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

DIVERSITY

Complete SOA U101 or one course from the list "Approved Courses: Diversity" on page 44.

MEDICAL LABORATORY SCIENCE GENERAL STUDIES COURSES

Mathematics Course

Complete the following course:

MTH U121 Precalculus 4 SH

Anatomy and Physiology

Complete the following two courses with corresponding labs:

BIO U303 Human Anatomy and Physiology 1 4 SH

with BIO U304 Lab for BIO U303 1 SH

BIO U305 Human Anatomy and Physiology 2 4 SH

with BIO U306 Lab for BIO U305 1 SH

Biology Courses

Complete the following four courses with corresponding labs:

BIO U111 General Biology 1 4 SH

with BIO U112 Lab for BIO U111 1 SH

BIO U113 General Biology 2 4 SH

with BIO U114 Lab for BIO U113 1 SH

BIO U301 Genetics and Molecular Biology 4 SH

with BIO U302 Lab for BIO U301 1 SH

BIO U323 Biochemistry 4 SH

with BIO U324 Lab for BIO U323 1 SH

Chemistry Courses

Complete the following four courses with corresponding labs:

CHM U211 General Chemistry 1 5 SH

CHM U214 General Chemistry 2 5 SH

CHM U311 Organic Chemistry 1 5 SH

CHM U313 Organic Chemistry 2 5 SH

MEDICAL LABORATORY SCIENCE MAJOR COURSES

Introductory Courses

Complete the following two courses:

MLS U101 MLS Orientation 1 SH

MLS U315 Medical Immunology 3 SH

Laboratory Courses

Complete the following two courses with corresponding labs with a grade of C or higher:

MLS U201 Laboratory Techniques 2 SH

with MLS U202 Lab for MLS U201 1 SH

MLS U301 Fundamentals of Core Lab Techniques 3 SH

with MLS U302 Lab for MLS U301 2 SH

College Required Course

BHS U450 Health Research Care 4 SH

Advanced Courses

Complete the following seven courses with corresponding labs:

MLS U505 Medical Microbiology 1 4 SH

with MLS U506 Lab for MLS U505 1 SH

MLS U520 Fundamentals of Hematology 4 SH

with MLS U521 Lab for MLS U520 1 SH

MLS U530 Clinical Chemistry 4 SH

MLS U550 Immunohematology 3 SH

with MLS U551 Lab for MLS U550 1 SH

MLS U542 Medical Microbiology 2 2 SH

with MLS U543 Lab for MLS U542 2 SH

MLS U601 Pathophysiology and Clinical 3 SH

Correlation

MLS U605 Management and Education 3 SH

Applied Study Courses

Complete the following six courses:

MLS U606	Lab Management Applications	1 SH
MLS U940	Microbiology Clinical Applied Study	4 SH
MLS U941	Immunology Clinical Applied Study	2 SH
MLS U942	Hematology Clinical Applied Study	3 SH
MLS U943	Clinical Chemistry Clinical Applied Study	4 SH
MLS U944	Immunoematology Clinical Applied Study	3 SH

GRADE REQUIREMENTS

A grade of C or higher is required in all MLS and professional prerequisite courses.

MLS GENERAL ELECTIVES

Complete two elective courses.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

136 total semester hours required

Minimum 2.000 GPA required

Minor in Medical Laboratory Chemistry**REQUIRED COURSES**

Complete the following four courses with corresponding labs:

CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH
BIO U111	General Biology 1	4 SH
with BIO U112	Lab for BIO U111	1 SH
BIO U113	General Biology 2	4 SH
with BIO U114	Lab for BIO U113	1 SH

MLS COURSES

Complete the following three courses and labs:

MLS U201	Laboratory Techniques	2 SH
with MLS U202	Lab for MLS U201	1 SH
MLS U301	Fundamentals of Core Lab Techniques	3 SH
with MLS U302	Lab for MLS U301	2 SH
MLS U530	Clinical Chemistry	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Hematology**REQUIRED COURSES**

Complete the following four courses with corresponding labs:

CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH
BIO U111	General Biology 1	4 SH
with BIO U112	Lab for BIO U111	1 SH
BIO U113	General Biology 2	4 SH
with BIO U114	Lab for BIO U113	1 SH

MLS COURSES

Complete the following four courses and labs:

MLS U201	Laboratory Techniques	2 SH
with MLS U202	Lab for MLS U201	1 SH
MLS U301	Fundamentals of Core Lab Techniques	3 SH
with MLS U302	Lab for MLS U301	2 SH

MLS U315	Medical Immunology	3 SH
MLS U520	Fundamentals of Hematology	4 SH
with MLS U521	Lab for MLS U520	1 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Immunoematology**REQUIRED COURSES**

Complete the following four courses with corresponding labs:

CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH
BIO U111	General Biology 1	4 SH
with BIO U112	Lab for BIO U111	1 SH
BIO U113	General Biology 2	4 SH
with BIO U114	Lab for BIO U113	1 SH

MLS COURSES

Complete the following four courses and labs:

MLS U201	Laboratory Techniques	2 SH
with MLS U202	Lab for MLS U201	1 SH
MLS U301	Fundamentals of Core Lab Techniques	3 SH
with MLS U302	Lab for MLS U301	2 SH
MLS U315	Medical Immunology	3 SH
MLS U550	Immunoematology	3 SH
with MLS U551	Lab for MLS U550	1 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Immunology**REQUIRED COURSES**

Complete the following four courses with corresponding labs:

CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH
BIO U111	General Biology 1	4 SH
with BIO U112	Lab for BIO U111	1 SH
BIO U113	General Biology 2	4 SH
with BIO U114	Lab for BIO U113	1 SH

MLS COURSES

Complete the following six courses and labs:

MLS U201	Laboratory Techniques	2 SH
with MLS U202	Lab for MLS U201	1 SH
MLS U301	Fundamentals of Core Lab Techniques	3 SH
with MLS U302	Lab for MLS U301	2 SH
MLS U315	Medical Immunology	3 SH
MLS U505	Medical Microbiology 1	4 SH
with MLS U506	Lab for MLS U505	1 SH
MLS U550	Immunoematology	3 SH
with MLS U551	Lab for MLS U550	1 SH
MLS U941	Immunology Clinical Applied Study	2 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Microbiology**REQUIRED COURSES**

Complete the following four courses with corresponding labs:

CHM U211	General Chemistry 1	5 SH
CHM U214	General Chemistry 2	5 SH
BIO U111	General Biology 1	4 SH
with BIO U112	Lab for BIO U111	1 SH
BIO U113	General Biology 2	4 SH
with BIO U114	Lab for BIO U113	1 SH

MLS COURSES

Complete the following four courses and labs:

MLS U201	Laboratory Techniques	2 SH
with MLS U202	Lab for MLS U201	1 SH
MLS U315	Medical Immunology	3 SH
MLS U505	Medical Microbiology 1	4 SH
with MLS U506	Lab for MLS U505	1 SH
MLS U542	Medical Microbiology 2	2 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

PHYSICAL THERAPY

MEREDITH H. HARRIS, EDD, PT
Associate Professor and Chair

ASSOCIATE PROFESSORS

Ann C. Noonan, EdD, PT
Robert Sikes, PhD
Chad A. Starkey, PhD, Athletic Training

ASSISTANT PROFESSORS

Cindy I. Buchanan, PhD, PT
Lorna Hayward, EdD, PT
Timothy Hilliard, PhD
Karen J. Hutchinson, PhD, PT
Mohammad Jamali, PhD
Christine R. Wilson, PhD, PT

SENIOR CLINICAL SPECIALIST

Lawrence P. Cahalin, PT, MS, CCS

ASSOCIATE CLINICAL SPECIALISTS

Marie B. Corkery, MS, PT, FAAOMT
Diane F. Fitzpatrick, PT, MS
Ann Golub-Victor, MPH, PT, PCS
Sonya L. Larrieux, MA, PT
Susan Lowe, BS, MS, PT, GCS, *Associate Chairperson*
Nancy H. Sharby, MS, PT
Susan H. Ventura, MEd, PT

ASSISTANT CLINICAL SPECIALISTS

Mary J. Hickey, BS, MHP, OCS
Jamie L. Musler, MEd, *Acting Program Director–Athletic Training*
Jaime Paz, MS, PT
Maryann Wilmarth, MS, PT, OCS, DPT

Entry-Level MSPT Program

The physical therapy program prepares its graduates to provide quality patient care in a time of changing concepts, trends, and challenges. Students learn to help clients gain functional independence and to recognize and manage the emotional and socioeconomic problems that affect recovery. The program in physical therapy culminates at the end of six years in an entry-level Master of Science degree in physical therapy.

Physical therapists provide services to patients and clients who have impairments, functional limitations, disabilities, or changes in physical function resulting from injury, disease, or other causes. In addition, physical therapists are involved in wellness initiatives, including screenings, health promotions, and educational activities that provide preventive care to prevent functional decline and/or to eliminate the need for costlier forms of care. They perform administrative duties and direct and supervise support personnel. Physical therapists interact and practice in collaboration with a variety of health-care professionals, including, but not limited to, physicians, dentists, nurses, educators, social workers, occupational therapists, speech-language pathologists, and audiologists.

Physical therapists function in a variety of settings, including community and university hospitals; rehabilitation centers; private practices; educational settings; extended-care facilities; freestanding outpatient clinics; home health agencies; and community, state, and federal agencies.

Through a commitment to excellence in teaching, research, and service, the Department of Physical Therapy develops individuals who are clinically competent, independent thinking health-care professionals. The program incorporates the University's Academic Common Experience objectives and encourages the development of communication skills, critical and creative thinking, information literacy, and interpersonal skills. It also emphasizes the importance of developing historical, ethical, aesthetic, diverse, and personal perspectives, and of understanding the contexts provided by natural, social, and cultural worlds. In the classroom, students develop problem-solving skills, manual dexterity, and proficiency in technique and with equipment.

Beginning in the second year of study, physical therapy students alternate semesters of academic study with semesters of cooperative education work experience. Students may be employed as physical therapy co-op students with increasing responsibilities commensurate with their academic studies, or they may perform other health-related preprofessional duties. These experiences provide an opportunity for the application and reinforcement of the lessons of the classroom and laboratory. Prior to graduation, students have twelve months of related work experience.

In addition to cooperative education, the program includes three eight-week clinical education courses that are mandated by the American Physical Therapy Association. Clinical education allows the student to practice clinical skills under the supervision of a licensed physical therapist. Clinical sites across the United States, offering a wide range of specialties, participate in our clinical education program. Every effort is made to accommodate individual circumstances, but students should be prepared to travel out of state for two of the three clinical courses. Availability of a car is also required, as most sites are not accessible by public transportation. All expenses associated with clinical education, including travel and housing, are the responsibility of the student. A very small number of sites offer student incentives including stipends, meals, and housing at low or no cost to the student, but that is becoming increasingly rare.

Students are accepted into the program as freshmen and do not need to reapply to the MS phase of the program, provided they adhere to (or meet) the academic standards. To progress in the program, students must maintain acceptable standards of scholarship and academic performance as outlined in the student handbook. Students must develop appropriate motor skills, professional behavior, and emotional maturity.

The program in physical therapy is accredited by the Commission on Accreditation in Physical Therapy Education of the American Physical Therapy Association.

Graduates of the Master of Science in Physical Therapy (MSPT) program are eligible to sit for the Physical Therapy Licensure Examination. See pages 382–385 for course descriptions.

MSPT Master of Science in Physical Therapy

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

DIVERSITY

Complete SOA U101 or one course from the list “Approved Courses: Diversity” on page 44.

PHYSICAL THERAPY GENERAL EDUCATION

Arts and Humanities

Complete a course from two of the three following groups.

History and Political Science

Choose any course from history (HST) or political science (POL).

Sociology

Choose any course from sociology (SOC) or anthropology (SOA).

Fine Arts

Choose any course from: ART, ASL, CMN, ENG, JRN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MUS, PHL, or THE.

Psychology

Complete the following two courses:

PSY U101 Foundations of Psychology 4 SH
PSY U404 Developmental Psychology 4 SH

Mathematics

Complete the following two courses:

MTH U141 Calculus 1 4 SH
MTH U280 Statistics and Software 4 SH

Biology

Complete two of the following courses with corresponding labs:

BIO U117 Integrated Anatomy and Physiology 1 4 SH
with BIO U118 Lab for BIO U117 1 SH
or BIO U303 Human Anatomy and Physiology 1 4 SH
with BIO U304 Lab for BIO U303 1 SH
or BIO U119 Integrated Anatomy and Physiology 2 4 SH
with BIO U120 Lab for BIO U119 1 SH
or BIO U305 Human Anatomy and Physiology 2 4 SH
with BIO U306 Lab for BIO U305 1 SH

Chemistry

Complete the following two courses with corresponding labs:

CHM U101 General Chemistry for Health Sciences 5 SH
CHM U104 Organic Chemistry for Health Sciences 5 SH

Physics

Complete the following two courses with corresponding labs:

PHY U145 Physics for Life Sciences 1 5 SH
PHY U147 Physics for Life Sciences 2 5 SH

Health Sciences

Complete the following two courses:

CES U500 Exercise Physiology 1 4 SH
PSC U340 Pharmacology 4 SH

PHYSICAL THERAPY MAJOR REQUIREMENTS

Introductory Courses

Complete the following three courses with corresponding labs:

PTH U201 Foundation of Physical Therapy 3 SH
with PTH U202 Lab for PTH U201 1 SH
PTH U203 Human Skills Development 2 SH
PTH U204 Therapeutic Modalities 1 SH
with PTH U205 Lab for U204 1 SH

Intermediate Courses

Complete the following six courses with corresponding labs:

PTH U301 Gross Anatomy 4 SH
with PTH U302 Lab for PTH U301 1 SH
PTH U303 Kinesiology 3 SH
with PTH U304 Lab for PTH U303 1 SH
PTH U308 Neuroscience 4 SH
with PTH U309 Lab for PTH U308 1 SH
PTH U310 Pathology 4 SH
PTH U400 Motor Control 3 SH
PTH U404 Psychosocial Management 2 SH

Advanced Courses

Complete the following six courses with corresponding labs:

PTH U500	Research	4 SH
PTH U503	Cardiovascular and Pulmonary Management	4 SH
with PTH U504	Lab for PTH U503	1 SH
PTH U505	Musculoskeletal Management 1	4 SH
with PTH U506	Lab for PTH U505	1 SH
PTH U508	Integumentary Systems Management 1	1 SH
with PTH U509	Lab for PTH U508	1 SH
PTH U525	Clinical Integration 1	2 SH
PTH U541	Research Seminar 1	1 SH

Professional Seminars

Complete the following two courses:

PTH U305	Physical Therapy Professional Seminar 1	2 SH
PTH U510	Physical Therapy Professional Seminar 2	2 SH

Professional Courses

Complete the following seven courses with corresponding labs:

PTH U515	Assistive Technology	3 SH
with PTH U516	Lab for PTH U515	1 SH
PTH U517	Neurological Management 1	4 SH
with PTH U518	Lab for PTH U517	1 SH
PTH U519	Physical Therapy Administration	3 SH
PTH U521	Neurological Management 2	4 SH
with PTH U522	Lab for PTH U521	1 SH
PTH U523	Musculoskeletal Management 2	4 SH
with PTH U524	Lab for PTH U523	1 SH
PTH U527	Clinical Integration 2	3 SH
PTH U543	Health Assessment and Wellness	3 SH

Clinicals

Complete the following four courses:

PTH U941	Clinical Education 1	6 SH
PTH U942	Clinical Education 2	6 SH
PTH U943	Clinical Education 3	6 SH
PTH U944	Clinical Education 4	4 SH

Advanced Topics

Complete one advanced topics course PTH U531 to PTH U537.

PHYSICAL THERAPY ELECTIVES

Choose seven PT electives with a minimum of three courses at the 500 level or graduate level. See department for an approved course list.

GRADE REQUIREMENTS

A grade of C or higher is required in all PTH courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

186 total semester hours required

Minimum 2.000 GPA required

SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY

LINDA FERRIER, PhD

Associate Professor and Chair

PROFESSOR

Mary Florentine, PhD

ASSOCIATE PROFESSORS

Sharon Y. Manuel, PhD

Robert Redden, EdD

Ralf W. Schlosser, PhD

ASSISTANT PROFESSORS

Rupal Patel, PhD

Therese M. O'Neil Pirozzi, ScD

CO-OP COORDINATOR

Katherine Malloy, MS

CLINICAL SPECIALISTS

Helen Anis, MA

Linda Collins, MA

Susan Fine, MS

Denise J. Frankoff, MA

Marjorie North, MA

Maria Vivas, MS

ASSOCIATE CLINICAL SPECIALIST

Sandy Cleveland, MS

Speech-language pathologists and audiologists are involved with the evaluation and treatment of, and counseling and research in, human communication and its disorders. The speech-language pathology and audiology program is designed to help students develop entry-level competencies that will enable them to function in a preprofessional capacity in educational settings, medical and rehabilitation centers, and private practice clinics. Students will be exposed to a wide variety of communication disorders through observations and participation in activities at the Northeastern University Speech and Hearing Center. This is a state-of-the-art facility in the new Behrakis building. Alongside their graduate student mentors, students learn the basics of clinical practice and research. Externship in schools, hospitals, or other relevant settings will also broaden students' exposure and prepare them for graduate study or employment.

Speech-language pathologists and audiologists provide clinical services to a full range of communicatively impaired individuals, from infants through geriatrics. Speech-language pathologists treat disorders such as developmental language and articulation disorders, voice and resonance problems, stuttering, and language and cognitive impairments due to stroke, head injury, and progressive neurologic diseases. Audiologists specialize in the prevention, identification, assessment, and

rehabilitation of hearing disorders. Individuals with congenital and acquired hearing impairments are seen for services by audiologists. They prescribe and dispense hearing aids and instruct individuals in the use of amplification. Undergraduate students take courses in both speech-language pathology and audiology in preparation for advanced training and specialization at the graduate level.

The Bachelor of Science degree program in speech-language pathology and audiology includes an experiential learning component, a broad-based academic core, and the scientific and clinical course work necessary for understanding normal and disordered communication. The degree offers preprofessional training for individuals who want to pursue graduate education in speech-language pathology and audiology. Alternately, graduates may be hired as speech and hearing assistants in a variety of clinical settings, or they may pursue other career paths in health care and education.

The speech-language pathology and audiology curriculum is designed to facilitate critical thinking, information literacy, and oral and written communication skills. In addition to course work in the basic communication sciences, course work is required in special needs/education, allied health, computer literacy, ethics, multicultural/diversity issues, and psychology. The curriculum provides a solid foundation in speech-language pathology and audiology and arts and sciences, and it is sufficiently flexible to provide students with the opportunity to minor in an area of related interest. By taking five courses in the standard curriculum, students may earn a minor in psychology.

Students may participate in the Bouvé Spanish Language and Latin Culture Program. This program consists of five courses designed to increase Spanish language skills and to prepare students to work with culturally diverse clients. The program provides students with an opportunity to collaborate on case studies with Spanish-speaking allied health students from the University of Puerto Rico.

A unique aspect of the speech-language pathology and audiology program is an accelerated graduate provision for students who qualify at the end of year three. Students who have maintained a GPA of 3.250 or better, who have a departmental endorsement, and who have satisfied all graduate program admissions requirements may seek admission to Northeastern University's graduate program in speech-language pathology and audiology. In effect, students who enter the accelerated master's degree track will complete the Bachelor of Science requirements within the framework of our graduate program. They will be eligible for the Master of Science and Bachelor of Science degrees and meet national certification requirements at the end of their fifth year of matriculation. The accelerated track is selective and a restricted number of students are admitted each year. The graduate programs in speech-language pathology and audiology and the University's Speech and Hearing Center are fully accredited by the American Speech-Language-Hearing Association. See pages 386–388 for course descriptions.

BS in Speech-Language Pathology and Audiology

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

DIVERSITY

Complete SOA U101 or one course from the list "Approved Courses: Diversity" on page 44.

SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY GENERAL EDUCATION REQUIREMENTS

Mathematics Requirement

Complete the following two courses:

MTH U121 Precalculus 4 SH

or MTH U141 Calculus 1 4 SH

MTH U280 Statistics and Software 4 SH

Anatomy and Physiology Requirement

Complete the following two courses with corresponding labs:

BIO U117 Integrated Anatomy and Physiology 1 4 SH

with BIO U118 Lab for BIO U117 1 SH

BIO U119 Integrated Anatomy and Physiology 2 4 SH

with BIO U120 Lab for BIO U119 1 SH

Psychology and Linguistics

Complete the following four courses:

PSY U101 Foundations of Psychology 4 SH

PSY U404 Developmental Psychology 4 SH

PSY U466 Cognition 4 SH

PSY U522 Psychology of Reading 4 SH

Philosophy

Complete one of the following courses:

PHL U114 Critical Reasoning 4 SH

or PHL U115 Introduction to Logic 4 SH

Education

Complete one course from the following or an alternate education class:

ED U561 Curriculum for the Pre-K Years 4 SH

ED U567 Literacy Development and Instruction 4 SH

ED U570 Inclusion, Equity, and Diversity 4 SH

Pharmacology

Complete the following course:

PSC U340 Pharmacology for the Health Professions 4 SH

SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY MAJOR REQUIREMENTS

College Required Courses

Complete the following four courses:

BHS U300 Communication Skills for the Health Professions 4 SH

BHS U301 Early Intervention 4 SH

BHS U450 Health-Care Research 4 SH

BHS U510 Health-Care Ethics 3 SH

Introductory Courses

Complete the following eight courses:

SLA U101	Introduction to Speech and Hearing	4 SH
SLA U102	Language Development	4 SH
SLA U103	Anatomy and Physiology of the Vocal Mechanism	4 SH
SLA U200	Phonetics	4 SH
SLA U201	Introduction to Co-op	1 SH
SLA U202	Neurological Bases of Communication	4 SH
SLA U203	Introduction to Audiology	4 SH
SLA U205	Speech and Hearing Science	4 SH

Advanced Courses

Complete the following five courses:

SLA U500	Language Disorders in Adults	4 SH
SLA U501	Language Disorders in Children	4 SH
SLA U503	Aural Rehabilitation	4 SH
SLA U600	Clinical Procedures	4 SH
SLA U650	Seminar in SLP and Audiology	4 SH

Research

Complete the following course:

SLA U701	Clinical Research Directed Study	1 SH
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GRADE REQUIREMENTS

A grade of C or higher is required in all SLA courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

132 total semester hours required

Minimum 2.000 GPA required

Changes to Progression Policy

For Professional Courses and Professional Prerequisites

1. Students must receive a C or better in five professional courses.

Course number	Course name
SLA U202	Neurological Bases of Communication
SLA U500	Language Disorders in Adults
SLA U501	Language Disorders in Children
SLA U503	Aural Rehabilitation
SLA U600	Clinical Procedures

2. Students must receive a C- or better in five professional prerequisites.

Course number	Course name
SLA U102	Language Development
SLA U103	Anatomy and Physiology of the Vocal Mechanism
SLA U200	Phonetics
SLA U203	Introduction to Audiology
SLA U205	Speech and Hearing Science

3. For all other courses the University's minimum passing grade for the course will be accepted.

Academic Standing

- Freshmen must have an overall GPA greater than or equal to 1.800 in order to maintain good academic standing.
- Upperclass students must have an overall GPA greater than or equal to 2.000 in order to maintain good academic standing.

Academic Progression

In order to progress from the freshman to sophomore year, the student must have a GPA of greater than or equal to 1.800 and have completed 27 semester hours. In order to progress into the subsequent year of professional courses, the student must have a grade of C or better and all professional prerequisites (as determined by the department) with a C- or better.

SCHOOL OF NURSING

NANCY HOFFART, PhD, RN

Professor and Dean

LEA A. JOHNSON, MS, MSN, RN

Assistant Dean of Administration

MARY ANNE GAUTHIER, EDD, RN, GNP

Director of Undergraduate Studies and Associate Professor

BARBARA KELLEY, EDD, MHP, MS, RN, CPNP

Director of the Graduate Program and Associate Professor

CAROL GLOD, PhD, RN, CS, FAAN

Research Director and Associate Professor

WENDY WILLIAMS, BSN, RN

Clinical Placement Administrator

ASSOCIATE PROFESSORS

Jane F. Aroian, MSN, EdD, RN

Michelle A. Beauchesne, MS, DNSc, RN, PNP

Olivia M. Breton, MEd, RN

Dorett Hope, MEd, EdD

Elizabeth M. Howard, MS, PhD, RN, ANP

Magdalena Mateo, PhD, RN, FAAN

Susan J. Roberts, MS, DNSc, RN, ANP

Mary Suzanne Tarmina, MS, PhD, RN, FNP

Rachel Zachariah, MS, DNSc, RN

ASSISTANT PROFESSORS

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Rhonda M. Board, MS, PhD, CCRN

Margaret H. Christensen, PhD, RN

Margaret Hamilton, DNSc, RN, CS

Joan A. Masters, MS, PhD, RN, CS

CLINICAL SPECIALISTS

Cynthia Dakin, PhD, RN

Brenda Douglas, MS, RN

Ann Hill, MS, RN, CNA, BC

Virginia Minichiello, PhD candidate, MSN, RN, ANP

ASSISTANT CLINICAL SPECIALISTS

Janet Dewan, MS, RN

Ann M. Kennedy, MS, RN

Patricia A. Kiladis, MS, RN

The School of Nursing offers a Bachelor of Science in nursing program designed to prepare students to become professional nurses for practice in a variety of health-care settings, such as hospitals, community health centers, schools, and homes. The school aims to provide all students—including those with diverse backgrounds and changing career goals—with a broad-based education that will foster ongoing personal and professional growth.

Nursing is both a science-based process and a caring art. The curriculum offers instruction in the sciences with opportunities in the humanities. Since nursing practice focuses on promoting, preserving, and restoring the health and well-being of individuals, families, groups, and communities across the life span, the curriculum emphasizes a community-based primary-care approach, which starts in the freshman year and builds throughout the program. This approach requires knowledge, skills, and attitudes related to health care that are comprehensive, culturally sensitive, continuous, effective, compassionate, and collaborative. Because the vast majority of people's lives are spent in the community, a significant part of the clinical program takes place in the community where people live, work, eat, rest, play, vote, and pray. Recognizing the equally important need to prepare nurses to care for ill patients in institutions, the program provides ample opportunities for nursing practice in hospitals, rehabilitation centers, and long-term-care facilities. The curriculum is capped by courses that enable students to put leadership and management skills into action, and to synthesize the complete role of the professional nurse in a clinical practicum.

In addition to completing academic course work, students must meet the cooperative education requirement, which gives them the opportunity to integrate the theory and practice of nursing in selected settings. Through more than seventy community and institutional health-care agencies in Greater Boston and across the country, students gain experience in providing nursing care to a variety of patients and families. Students learn that nurses have major roles in wellness and health promotion, acute care, and long-term care.

The baccalaureate nursing program provides the educational background needed for graduate study in nursing specialties. Successful completion of the baccalaureate program allows graduates to take the National Council Licensing Examination (NCLEX-RN) to become registered nurses.

The program is accredited by the National League for Nursing and the Commission on Collegiate Nursing Education and is approved by the Board of Registration in Nursing of the Commonwealth of Massachusetts. Accreditation and approval indicate that the program meets educational standards for faculty, curriculum design, student quality, and overall University support. The school subscribes to the standards established by the American Association of Colleges of Nursing, of which it is a member. See pages 351–353 for course descriptions.

Special Requirements

Each year students must receive a health clearance. Students in the School of Nursing are required to wear the approved school uniform in some clinical laboratory areas during academic semesters. All students assigned to a clinical nursing course must be certified in cardiopulmonary resuscitation (CPR); annual recertification is required; in addition, Criminal Offender Record Information (CORI) is required and updated contingent to clinical requirements. Students enrolled in the clinical courses must have access to a car to travel to assigned agencies and are responsible for their own transportation costs.

Transfer Student Track

The School of Nursing welcomes transfer students and students planning a career change who have a degree in another field. Recommended entering requirements include two semesters of anatomy and physiology (with lab) and one chemistry course (with lab). Overall GPA should be a minimum of 2.500 for consideration into the program. A microbiology course (with lab) is strongly recommended. Students are accepted into this track for the fall semester only. Once accepted, the transfer student follows a fixed curriculum plan that includes two cooperative education experiences. Students may complete their baccalaureate program requirements in approximately six semesters.

RN to BSN Option

The school accepts registered nurses who wish to complete requirements for a Bachelor of Science in nursing degree into the part-time University College evening section. The program length varies, depending on the individual's previous educational experience and ability to achieve advancement through the development of a portfolio to validate prior learning. Students may take the program on a part-time basis, thus allowing them to continue working while enrolled in school.

BSN—Bachelor of Science in Nursing

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

DIVERSITY

Complete the following course:

NUR U210 Influences on Health and Illness 3 SH

**REQUIRED GENERAL EDUCATION COURSES
FOR NURSING MAJOR**

Mathematics and Statistics Courses

Complete one algebra/precalculus/calculus course and one statistics course.

ALGEBRA/PRECALCULUS/CALCULUS

MTH U110 College Algebra 4 SH

MTH U115 Applications of Algebra 4 SH

MTH U121 Precalculus 4 SH

MTH U141 Calculus 1 4 SH

MTH U142 Calculus 2 4 SH

**MTH U151 Calculus and Differential Equations
for Biology 1 4 SH**

**MTH U152 Calculus and Differential Equations
for Biology 2 4 SH**

STATISTICS

ECN U350 Statistics 4 SH

MTH U180 Statistical Thinking 4 SH

MTH U280 Statistics and Software 4 SH

POL U400 Quantitative Techniques 4 SH

PSY U320 Statistics in Psychological Research 5 SH

SOC U320 Statistical Analysis in Sociology 4 SH

Psychology

Complete the following course:

PSY U101 Foundations of Psychology 4 SH

Sociology

Complete one sociology (SOC) elective.

Anatomy and Physiology

Complete two of the following courses with corresponding labs:

BIO U303 Human Anatomy and Physiology 1 4 SH

with BIO U304 Lab for BIO U303 1 SH

or BIO U117 Integrated Anatomy and Physiology 1 4 SH

with BIO U118 Lab for BIO U117 1 SH

BIO U305 Human Anatomy and Physiology 2 4 SH

with BIO U306 Lab for BIO U305 1 SH

or BIO U119 Integrated Anatomy and Physiology 2 4 SH

with BIO U120 Lab for BIO U119 1 SH

Microbiology

Complete the following course with corresponding lab:

BIO U121 Basic Microbiology 4 SH

with BIO U122 Lab for BIO U121 1 SH

Chemistry Course

Complete the following course with corresponding lab:

CHM U101 General Chemistry for Health Sciences 5 SH

NURSING MAJOR—BOUVÉ SCIENCE COURSES*Influences on Health*

Complete the following course:

BHS U105 Nutrition 4 SH

Health-Care System

Complete the following five courses:

BHS U250 The American Health-Care System 3 SH

BHS U450 Health-Care Research 4 SH

BHS U510 Health-Care Ethics 3 SH

BHS U511 Health-Care Management 3 SH

BHS U515 Health Policy 3 SH

Pharmacology

Complete the following course:

PSC U340 Pharmacology 1 4 SH

NURSING MAJOR REQUIREMENTS*Introductory Courses*

Complete the following four courses:

NUR U101 Nurses as Caregivers 3 SH

NUR U103 Assessment across the Life Cycle 5 SH

NUR U200 Nursing as a Practice-Based Profession 5 SH

NUR U210 Influences on Health and Illness 3 SH
(satisfies the University diversity requirement)

Intermediate Courses

Complete the following five courses:

NUR U300 Pathophysiology 3 SH

NUR U302 Nursing with Women and Families 5 SH

**NUR U306 Nursing with Acutely Ill Adults
and Families 8 SH**

NUR U310 Nursing Adults in the Community 2 SH

**NUR U400 Nursing and the Promotion
of Mental Health 5 SH**

Advanced Courses

Complete the following four courses:

**NUR U500 Nursing with Acutely Ill Children
and Families 5 SH**

NUR U510 Caregiving: Children across Continuum 2 SH

NUR U600 Nursing with Vulnerable Populations 5 SH

NUR U610 Managing and Leading in Health Care 3 SH

Practicum

Complete one of the following two courses:

NUR U945 Comprehensive Nursing Practicum 4 SH

or NUR U946 Comprehensive Nursing Practicum 2 6 SH

GRADE REQUIREMENTS

A grade of C or higher is required in all nursing courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

128 total semester hours required

Minimum 2.000 GPA required

Electives

The School of Nursing offers electives that enable students to satisfy their personal objectives. They include Independent Study, Wellness, and Perioperative Nursing.

SCHOOL OF PHARMACY

DANIEL C. ROBINSON, PHARM D

Dean of the School and Associate Dean of the College

Department of Pharmaceutical Sciences

Vladimir P. Torchilin, PhD, DSc, *Professor and Chair*

PROFESSORS

Richard C. Deth, PhD

Roger W. Giese, PhD

Ban An Khaw, PhD

ASSOCIATE PROFESSORS

Mansoor Amiji, PhD

Norman R. Boisse, PhD

Jonathan Freedman, PhD

Ralph H. Loring, PhD

Robert A. Schatz, PhD

Barbara L. Waszczak, PhD

ASSISTANT PROFESSORS

Robert Campbell, PhD

Volkmar Weissig, PhD

Jiang Zheng, PhD

LECTURER

Eugene A. Bernstein, PhD

Department of Pharmacy Practice

Jack R. Reynolds, PharmD, *Professor and Chair*

PROFESSOR

Gerald E. Schumacher, PharmD, PhD

ASSOCIATE PROFESSORS

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Robert J. Cersosimo, PharmD

S. James Matthews, PharmD

ASSISTANT PROFESSOR

Alisha B. Dunn, PharmD

ASSOCIATE CLINICAL SPECIALISTS

Todd A. Brown, MHP

Michelle M. Chapman, PharmD

Jennifer M. Trujillo, PharmD

ASSISTANT CLINICAL SPECIALISTS

Jennifer L. Berard, PharmD

Janine D. Buenviaje, PharmD

Margarita V. DiVall, PharmD

Tanya M. Dougherty, PharmD

Mark Douglass, PharmD

Janine D. Fournier, PharmD

Steven Gabardi, PharmD

Michael J. Gonyeau, PharmD

Yolanda M. Hardy, PharmD

Jennifer L. Kirwin, PharmD

Debra C. Mahfouz, PharmD

Christopher M. McCoy, PharmD

Jenny A. Van Amburgh, PharmD

Pharmacists promote the safe use of drugs by providing pharmaceutical care. The expanding role of the pharmacist as a clinical drug consultant to physicians, nurses, health-care professionals, and patients has broadened the scope of professional opportunities. In addition to preparing and dispensing medications prescribed by physicians, pharmacists are actively involved in improving drug therapy outcomes through direct involvement with patients and other members of the health-care team.

The School of Pharmacy also offers careers in management, research, manufacturing, government, and education. Many graduates of the pharmacy program go on to leading graduate schools, residencies, or fellowship programs for specialized training.

The curriculum offers a blend of academic and cooperative education experiences. The entry-level, cooperative education six-year Doctor of Pharmacy program opened for entering freshmen in the fall of 1997.

In order to be eligible for any pharmacy degree, a student must have satisfactorily completed all prescribed courses in his or her curriculum, have an overall 2.000 grade-point average (GPA), and must meet the cooperative education, advanced-practice experience, and other requirements as stated in the *Bouvé College of Health Sciences Undergraduate Student Information Manual*. The undergraduate program, which is accredited by the American Council on Pharmaceutical Education (ACPE), subscribes to the standards established by ACPE and the American Association of Colleges of Pharmacy.

Pharmacy graduates must meet certain requirements to obtain a license from the state in which they want to practice. Those requirements include graduation from an accredited school of pharmacy, passing an examination given by a state board of pharmacy, and completing an internship.

The internship is a period of supervised practical experience under the supervision of a registered pharmacist. Massachusetts requires 1,500 internship hours, of which 1,100 hours can be satisfied through cooperative education in years three through five. Students may apply for up to 400 internship hours during their advanced-practice experiences in year six.

The profession of pharmacy requires a significant amount of patient contact. Counseling by the pharmacist is considered essential to the effective and safe use of medications. Community pharmacy offers the opportunity to combine specialized pharmaceutical training with skills in clinical patient management, business administration, and marketing. In addition to patient contact and counseling, community pharmacists also spend considerable time discussing health-related matters with the prescribing physicians. Hospital pharmacists

are responsible for medication control and distribution. In addition, they have the opportunity to apply clinical skills in the management of drug therapy through participation in patient rounds, drug utilization review, and consultation with physicians on individual therapeutic regimens. Opportunities are expanding for pharmacists elsewhere. Health maintenance organizations, private practice groups, long-term-care facilities, home health care, the Public Health Service, the armed services, and law enforcement agencies such as the Federal Drug Enforcement Administration all require pharmacists. Other graduates find employment in drug development or marketing, colleges of pharmacy, or professional association management. A growing number of pharmacy graduates seek additional degrees and training in pharmaceutical research (PhD), business administration (MBA), or law (JD) to complement their strong pharmacy training.

PharmD—Doctor of Pharmacy

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C is required in both courses.

DIVERSITY

Complete SOA U101 or one course from the list “Approved Courses: Diversity” on page 44.

PHARMACY GENERAL EDUCATION REQUIREMENTS

Psychology Course

Complete the following course:

PSY U101 Foundations of Psychology 4 SH

Mathematics Course

Complete the following course:

MTH U141 Calculus 1 4 SH

Biology Courses

Complete the following two courses with corresponding labs:

BIO U111 General Biology 1 4 SH

with BIO U112 Lab for BIO U111 1 SH

BIO U113 General Biology 2 4 SH

with BIO U114 Lab for BIO U113 1 SH

Chemistry Courses

Complete the following four courses with corresponding labs:

CHM U211 General Chemistry 1 5 SH

CHM U214 General Chemistry 2 5 SH

CHM U311 Organic Chemistry 1 5 SH

CHM U313 Organic Chemistry 2 5 SH

Anatomy and Physiology

Complete the following two courses with corresponding labs:

PSC U301 Human Physiology and Anatomy 1 3 SH

with PSC U302 Human Physiology and Anatomy 1—Lab 1 SH

PSC U303 Human Physiology and Anatomy 2 3 SH

with PSC U304 Human Physiology and Anatomy 2—Lab 1 SH

Physics Course

Complete the following course with corresponding lab:

PHY U149 Physics for Pharmacy 5 SH

Elective Courses

Complete two courses from a nonscience field:

ACC, AFR, ARC, ART, ASL, CJ, CMN, ECN, ED, ENG, ENT, FIN, HRM, HS, HST, IAF, INB, INT, JRN, LIN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MGT, MKT, MMS, MSC, MUS, PHL, POL, PSY, SOA, SOC, THE, or TRN.

PHARMACY MAJOR

Introductory Courses

Complete the following three courses:

PMD U101 Introduction to the Profession of Pharmacy 1 SH

PMD U201 Introduction to Pharmacy Practice 1 SH

PMD U310 Communications 3 SH

Professional Series 1

Complete the following nine courses:

PSC U320 Biochemistry 4 SH

PSC U360 Medical Microbiology 3 SH

PSC U411 Pharmaceutics 1 4 SH

PSC U412 Pharmaceutics 2 4 SH

PSC U419 Pharmaceutics Laboratory 1 SH

PMD U341 Pharmacy Seminar 1 SH

PMD U350 Health-Care Systems 3 SH

PSC U501 Pharmacology/Medicinal Chemistry 1 5 SH

PSC U502 Pharmacology/Medicinal Chemistry 2 5 SH

Professional Series 2

Complete the following ten courses:

PSC U330 Immunology 3 SH

PSC U430 Pharmacokinetics and Biopharmaceutics 3 SH

PMD U401 Pathophysiology 4 SH

PMD U440 Self-Care Therapeutics 4 SH

PMD U450 Research Methodology and Biostatistics 4 SH

PMD U510 Therapeutic Drug Monitoring 2 SH

and Applications

PMD U530 Jurisprudence 3 SH

PMD U539 Introduction to Therapeutics 4 SH

PMD U560 Drug Information and Evaluation 3 SH

TOX U570 Clinical Toxicology 2 SH

Professional Series 3

Complete the following eight courses:

PMD U541 Therapeutics 1 4 SH

PMD U542 Therapeutics 2 4 SH

PMD U544 Therapeutics 3 4 SH

PMD U545 Therapeutics 4 4 SH

PMD U550 Pharmacy Care Management 3 SH

PMD U569 Pharmaceutical Care Practice 1 2 SH

PMD U570 Pharmacoeconomics 4 SH

PMD U579 Pharmaceutical Care Practice 2 2 SH

Advanced Practice Experience

Complete 36 semester hours of clinical experience from PMD U940 to PMD U968.

Interdisciplinary Elective

Choose one course from the BHS department.

Pharmacy Electives

Choose two courses from the pharmacy department. See department for approved list.

GRADE REQUIREMENTS

A grade of C or higher is required in all PMD and PSC courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

210 total semester hours required

Minimum 2.000 GPA required

TOXICOLOGY

ROBERT A. SCHATZ, PhD

Associate Professor and Director

Toxicology examines the adverse effects of chemicals on biologic systems, the conditions under which those effects occur, and the relevant socioeconomic conditions and legal ramifications. The program offers a five-year Bachelor of Science degree that prepares students for work in a variety of specialties.

Forensic toxicology is a hybrid of analytical chemistry and fundamental toxicological principles that focuses on the medical and legal aspects of the harmful effects of chemicals. Biomedical toxicologists are concerned with intoxication by drugs and other chemicals. They are also involved in demonstrating the safety or danger of a drug prior to its release on the market.

Industrial or environmental toxicologists specialize in recognizing, identifying, and quantitating the relative hazards from occupational or public exposure to toxicants. Toxicologists who practice this specialty play a vital role in ensuring the safety of those in the workforce or the general public who come into contact with industrial and commercial products.

Numerous federal and local laws aimed at protecting the environment, safeguarding employees in their workplaces, and protecting consumers against hazardous household products have created a critical demand for toxicologists. Job opportunities exist in government, pharmaceutical/biotech industries, and environmental firms. Many graduates pursue advanced studies. See pages 398–399 for course descriptions.

BS in Toxicology**ENGLISH REQUIREMENT**

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C is required in both courses.

DIVERSITY

Complete SOA U101 or one course from the list “Approved Courses: Diversity” on page 44.

TOXICOLOGY GENERAL EDUCATION REQUIREMENTS**Mathematics**

Complete the following two courses:

MTH U141 Calculus 1 4 SH

MTH U142 Calculus 2 4 SH

Statistics

Complete the following course:

PSY U320 Statistics in Psychological Research 5 SH

Biology

Complete the following two courses with corresponding labs:

BIO U111 General Biology 1 4 SH

with BIO U112 Lab for BIO U111 1 SH

BIO U113 General Biology 2 4 SH

with BIO U114 Lab for BIO U113 1 SH

Biochemistry

Complete the following course:

PSC U320 Biochemistry 4 SH

Anatomy and Physiology

Complete the following two courses with corresponding labs:

PSC U301 Human Physiology and Anatomy 1 3 SH

with PSC U302 Human Physiology and Anatomy 1—Lab 1 SH

PSC U303 Human Physiology and Anatomy 2 3 SH

with PSC U304 Human Physiology and Anatomy 2—Lab 1 SH

Chemistry

Complete the following two courses with corresponding labs:

CHM U211 General Chemistry 1 5 SH

with CHM U214 General Chemistry 2 5 SH

CHM U311 Organic Chemistry 1 5 SH

with CHM U313 Organic Chemistry 2 5 SH

Physics

Complete the following course with corresponding lab:

PHY U149 Physics for Pharmacy 5 SH

Arts and Science Electives

Complete three courses from the following departments:

AFR, ARC, ART, ASL, CIN, CMN, ECN, ED, ENG, ENV, GEO,

HS, HST, IAF, INT, JRN, LIN, LNA, LNC, LNF, LNG, LNI,

LNJ, LNL, LNM, LNR, LNS, MMS, MTH, MUS, PHL, POL,

PSY, SOA, SOC, or THE.

PHARMACEUTICAL SCIENCES/TOXICOLOGY

MAJOR REQUIREMENTS

Toxicology

Complete the following five courses and corresponding lab:

TOX U101	Toxicology Orientation	1 SH
TOX U572	Environmental Toxicology	3 SH
TOX U574	Organ Systems Toxicology	3 SH
TOX U576	Experimental Toxicology	3 SH
TOX U570	Clinical Toxicology	2 SH
with TOX U578	Biochemical Toxicology Lab	3 SH

Pathophysiology

Complete the following course:

PMD U401	Pathophysiology 1	4 SH
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Research

Complete the following course:

TOX U701	Toxicology Research	4 SH
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Immunology

Complete the following course:

PSC U330	Immunology	3 SH
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Pharmacology

Complete the following course:

PSC U340	Pharmacology for the Health Professions	4 SH
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Forensic Science

Complete the following course:

MLS U299	Foundations of Forensic Lab Science	3 SH
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Professional Electives

Complete three courses from the following list:

BIO U145	Environment and Humankind	4 SH
CHE U620	Pollution Control in Chemical Industries	4 SH
CIV U334	Environmental Engineering 1	4 SH
ECN U420	Urban Economic Issues	4 SH
GEO U102	Marine Resources	4 SH
GEO U112	Environmental Geology	4 SH
GEO U220	History of Earth and Life	4 SH
GEO U510	Environmental Planning	4 SH
GEO U550	Geology and Land-Use Planning	4 SH
HST U222	History of Science and Technology	4 SH
HST U342	Environmental History of North America	4 SH
INT U310	Water Resources Policy and Management	4 SH
MLS U201	Laboratory Techniques	2 SH
PHL U180	Ecology Ethics	4 SH
POL U395	Environmental Politics	4 SH
PSY U510	Psychopharmacology	4 SH
SOC U246	Environment and Sociology	4 SH
SOC U295	Drugs and Society	4 SH

GRADE REQUIREMENTS

A grade of C or higher is required in all toxicology courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

College of Business Administration

IRA R. WEISS, PhD, *Dean*

Jeffery A. Born, PhD, *Senior Associate Dean for Academic Affairs*
 Therese M. Hofmann, MBA, *Associate Dean/Director for
 Graduate Programs*
 Peggy Fletcher, MBA, *Associate Dean for Undergraduate
 Programs*

Accounting Group

PROFESSORS

Jean C. Bedard, PhD
 Sharon M. Bruns, PhD
 Paul A. Janell, PhD, *Joseph M. Golemme Professor of Accounting*
 Marjorie Platt, PhD
 Ira R. Weiss, PhD

ASSOCIATE PROFESSORS

Julie Hertenstein, DBA
 Cynthia M. Jackson, PhD
 Ganesh Krishnamoorthy, PhD
 Mario J. Maletta, PhD
 James J. Maroney, PhD
 Timothy J. Rupert, PhD
 H. David Sherman, DBA

ASSISTANT PROFESSOR

Diana Falsetta, PhD

LECTURERS

Michael D. Cottrill, MAC
 Hugh J. Crossland, LLM
 Lynn W. Marples, MBA
 Peggy L. O'Kelly, MBA

Finance and Insurance Group

PROFESSORS

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 Joseph W. Meador, PhD
 Harlan D. Platt, PhD
 Jonathan B. Welch, PhD

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 Robert M. Mooradian, PhD

Donald R. Rich, PhD
 Emery A. Trahan, PhD
 Shiawee X. Yang, PhD

ASSISTANT PROFESSORS

Cetin Ciner, PhD
 Olubunmi Faleye, PhD
 Jinliang Li, PhD
 Gopala K. Vasudevan, PhD

ACADEMIC SPECIALIST

Steven R. Kursh, PhD

LECTURERS

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 Richard J. Goettle, PhD
 Eliot H. Sherman, MST
 Richard S. Swasey Jr., MBA
 Ronald M. Whitfield, PhD

General Management Group

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 Robert C. Lieb, DBA
 Daniel J. McCarthy, DBA
 Marc H. Meyer, PhD
 James F. Molloy Jr., PhD
 Sheila M. Puffer, PhD
 Ravi Ramamurti, DBA
 Ravi Sarathy, PhD
 Heidi Vernon, PhD

ASSOCIATE PROFESSORS

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 William F. Crittenden, PhD
 Raymond M. Kinnunen, DBA
 Carl W. Nelson, PhD

ASSISTANT PROFESSORS

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 Christopher J. Robertson, PhD
 Andrew Watson, PhD

ACADEMIC SPECIALISTS

John H. Friar, PhD
 Joseph M. Giglio, MS, MPA

ASSISTANT ACADEMIC SPECIALIST

Edmund L. Clark, MBA

LECTURERS

Michael J. Power, MBA
Ronald S. Thomas, PhD
William T. Tita, PhD

Human Resources Group

PROFESSORS

Rae Andre, PhD
David P. Boyd, PhD
Ralph Katz, PhD
Edward F. McDonough III, PhD

ASSOCIATE PROFESSORS

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Thomas M. Begley, PhD
Cynthia Lee, PhD
Bert A. Spector, PhD
Francis C. Spital, PhD
Edward G. Wertheim, PhD

ACADEMIC SPECIALIST

Leonard J. Glick, EdD

Management Science Group

PROFESSORS

Ramaiya Balachandra, PhD
Sangit Chatterjee, PhD
Michael J. Maggard, PhD
Robert A. Millen, PhD
Marius M. Solomon, PhD
Frederick Wiseman, PhD
Mustafa R. Yilmaz, PhD

ASSOCIATE PROFESSORS

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Michael H. Zack, DBA

ASSISTANT PROFESSORS

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Aykut Firat, PhD
Yang W. Lee, PhD

ACADEMIC SPECIALIST

Leslie D. Ball, PhD

LECTURERS

Richard J. Briotta, DBA
Mohamed Habibullah, PhD
Bahman Zangenah, PhD

Marketing Group

PROFESSOR

Samuel Rabino, PhD

ASSOCIATE PROFESSORS

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Bruce H. Clark, PhD
Dan T. Dunn Jr., DBA
Fareena Sultan, PhD
Robert F. Young, DBA

ASSISTANT PROFESSORS

Roseanna Garcia, PhD
Ronald J. Kuntze, PhD
Felicia G. Lassk, PhD
Andrew J. Rohm, PhD

LECTURERS

Susan F. Sieloff, MBA
John L. Teopaco, PhD

Programs in the College of Business Administration are designed for students who are preparing to take on managerial responsibility. These programs help students develop the ability to recognize and solve business and organizational problems and understand the role of business in the community, the nation, and the world.

The college's goal is to help students develop ideals that are ethically sound and socially desirable; cultivate an awareness of the social, political, and economic developments to which businesses must adapt; develop sound judgment and effective communication skills; and develop their individual interests and talents.

Modern business faces many challenges from unprecedented political change and the effects of foreign policy, high technology, affirmative action regulations, and new economic policies. These challenges have increased the demand for highly trained individuals equipped to analyze and address our economy's complex social and legal problems.

The college offers Bachelor of Science degrees in international business and in business administration with concentrations in accounting, entrepreneurship and small business management, finance and insurance, human resources management, international business, logistics and transportation, management, management information systems, and marketing. The business curriculum is enhanced by courses in the sciences, humanities, and social sciences. In addition to their academic courses, all students are required to complete a five-year or a four-year cooperative education plan.

Co-op provides a learning experience beyond the classroom. Textbook examples come to life in real-world business settings. Classroom theories are applied to actual business problems. In turn, these experiences serve to stimulate inquiry and discussion back in the classroom. This interaction between college studies and cooperative education sets the stage for a lifetime of learning.

The undergraduate program of the College of Business Administration meets the standards of the American Assembly of Collegiate Schools of Business for faculty and student quality, curriculum design, and overall University support.

Business majors go on to graduate work in business as well as public health care and education administration. Many careers in law also require an understanding of business concepts. Although the Association of American Law Schools does not recommend particular courses for prelegal students, it does advise undergraduates to develop critical understanding of the institutions and values with which the law deals.

Class Entrance Requirements

Listed below are the grade-point averages required for students to advance to the next class year and to graduate.

	Overall GPA	Freshman Core Courses GPA*	Business Courses GPA
Sophomore	2.000	2.000	2.000
Middler	2.000		2.000
Junior	2.000		2.000
Senior	2.000		2.000
To graduate	2.000		2.000

*Freshman Core Courses refers to College Writing 1 and 2, Macroeconomics and Microeconomics, Calculus for Business, and Introduction to Business.

Graduation Requirements

Bachelor of Science degree candidates must complete all prescribed work of the curriculum in which they seek to qualify, currently 128 semester hours. The degree not only represents the formal completion of selected courses, but also indicates professional study in the major or concentration. A grade-point average of C (2.000) and a C average in all business courses are required for graduation. Students must be enrolled in a full program of studies in the College of Business Administration during the final three semesters preceding graduation.

Minor in Business Administration

All courses in the College of Business Administration are available to all nonbusiness students at Northeastern University if they meet the class standing and course requirements. Nonbusiness students may find the minor attractive if they are considering a career in business or pursuing an MBA. The minor consists of eight courses. Students who wish to enter the program should speak with an adviser in the Undergraduate Business Programs Office upon successful completion of at least the macroeconomics and college algebra courses. Students who complete all eight courses successfully and have earned at least a C (2.000) average in them will be awarded a minor in business administration at graduation.

Minor in Business Administration

ACCOUNTING

Complete the following course:

ACC U201 Financial Accounting and Reporting 4 SH

HUMAN RESOURCE MANAGEMENT

Complete the following course:

HRM U201 Organizational Behavior 4 SH

FINANCE

Complete the following course:

FIN U201 Financial Management 4 SH

MARKETING

Complete the following course:

MKT U201 Marketing 4 SH

BUSINESS ELECTIVE

Choose one course for which the prerequisites have been met.

GPA REQUIREMENTS

2.000 GPA required in the minor

BSBA Core Requirements

Each student seeking the Bachelor of Science in Business Administration (BSBA) degree must complete the following core requirements.

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C is required in both courses.

DIVERSITY

Complete one course from the list “Approved Courses: Diversity” on page 44.

MATHEMATICS*Calculus*

Complete one calculus course:

MTH U131 Calculus for Business and Economics 4 SH

MTH U141 Calculus 1 4 SH

MTH U142 Calculus 2 4 SH

MTH U151 Calculus and Differential Equations for Biology 1 4 SH

MTH U152 Calculus and Differential Equations for Biology 2 4 SH

MTH U240 Intensive Calculus for Engineers 6 SH

MTH U241 Calculus 1 for Science and Engineering 4 SH

Statistics

Complete the following course:

MSC U201 Business Statistics 4 SH

METHODS OF INQUIRY*Natural World*

Complete one course from the list “Approved Courses: Methods of Inquiry—Natural World Context” on page 43.

Social World

Complete one course from the list “Approved Courses: Methods of Inquiry—Social World Context” on page 43.

Arts and Humanities

Complete one course from the list “Approved Courses: Methods of Inquiry—Arts Context” on page 43 or one course from the list “Approved Courses: Methods of Inquiry—Humanities Context” on page 43.

HISTORICAL, ETHICAL, AND AESTHETIC PERSPECTIVE

Complete one course from the list “Approved Courses: Historical, Ethical, and Aesthetic Perspectives” on page 44.

MACRO- AND MICROECONOMICS

Complete the following two courses:

ECN U115 Principles of Macroeconomics 4 SH

ECN U116 Principles of Microeconomics 4 SH

BUSINESS REQUIREMENTS*Accounting*

Complete the following two courses:

ACC U201 Financial Accounting and Reporting 4 SH

ACC U301 Managerial Accounting 4 SH

Marketing

Complete the following course:

MKT U201 Introduction to Marketing 4 SH

Finance

Complete the following course:

FIN U201 Financial Management 4 SH

Management Information Systems

Complete the following course:

MIS U301 Management Information Systems 4 SH

Operations Management

Complete the following course:

MSC U401 Operations Management 4 SH

Organizational Behavior

Complete the following course:

HRM U201 Organizational Behavior 4 SH

Strategic Management

Complete the following course:

MGT U501 Strategy in Action 4 SH

ACCOUNTING

A concentration in accounting prepares the graduate for entry into one of the fastest-growing and most critical areas of management. Accounting is an exciting field that requires critical thinking, skills to interpret business data and to deal with people, as well as an appreciation of precision and accuracy. Accountants hold sensitive management positions in private companies in business or industry, public accounting firms, and government agencies.

To prepare for an accounting career, students take courses in financial reporting, managerial accounting, and accounting information systems. Elective courses are available for more specialized study in strategic cost analysis, assurance services, and taxation. See pages 190–191 for course descriptions.

BSBA in Accounting**COLLEGE OF BUSINESS ADMINISTRATION****BSBA CORE REQUIREMENTS**

See below for requirement list.

ACCOUNTING MAJOR REQUIREMENTS*Required Courses*

Complete the following three courses:

ACC U401 Financial Reporting and Analysis 1 4 SH

ACC U501	Financial Reporting and Analysis 2	4 SH
ACC U403	Accounting Information Systems	4 SH

Elective Course

Complete one additional ACC course.

BUSINESS ELECTIVES OR SECOND BUSINESS CONCENTRATION

Complete four business electives (from departments ACC, ENT, FIN, HRM, INB, MGT, MIS, MKT, MSC, or SCM) or complete a second business concentration (different from that of your major) from the list “Second Business Concentrations” on page 148.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

ELECTIVES OUTSIDE BUSINESS

Complete six courses outside business. These courses would typically include:

CBA U101	Introduction to Business	4 SH
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CREDIT OUTSIDE BUSINESS

At least 64 semester hours must be earned in courses outside business.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

128 total semester hours required

Minimum 2.000 GPA required

ENTREPRENEURSHIP AND SMALL BUSINESS MANAGEMENT

By combining technological and service innovation with the great incentive to enhance personal wealth, today’s entrepreneur is an important engine for growth and job creation in our economy. Entrepreneurs come in many varieties: from those who start one-person firms to those who start growth ventures that will go public and become large companies. Rather than starting their own businesses, some of our students assume responsibility for family businesses and expand them through new strategies and financing. Still other students are hired by large corporations that are trying to learn entrepreneurial thinking to create new business units and renew traditional product lines.

The entrepreneurship and small business management concentration guides students through the process of developing new business concepts, writing business plans for those concepts, and seeking venture financing. We expose students to a wide range of entrepreneurs and investors. Students will also learn how to manage a small, growing business, which will help some of our students better manage and expand their existing family-owned businesses. The most entrepreneurial of seniors may compete in a special undergraduate track for

start-up financing in Northeastern’s \$60K Business Plan Competition.

BSBA in Entrepreneurship and Small Business Management

COLLEGE OF BUSINESS ADMINISTRATION**BSBA CORE REQUIREMENTS**

See page 140 for requirement list.

ENTREPRENEURSHIP AND SMALL BUSINESS MANAGEMENT MAJOR REQUIREMENTS
Required Courses

Complete the following four courses:

ENT U201	Entrepreneurship	4 SH
ENT U301	Opportunity Assessment and Entrepreneurial Market	4 SH
ENT U401	Management of Small and Medium Enterprises	4 SH
ENT U501	Growth Venture Creation	4 SH

BUSINESS ELECTIVES OR SECOND BUSINESS CONCENTRATION

Complete four business electives (from departments ACC, ENT, FIN, HRM, INB, MGT, MIS, MKT, MSC, or SCM) or complete a second business concentration (different from that of your major) from the list “Second Business Concentrations” on page 148.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

ELECTIVES OUTSIDE BUSINESS

Complete six courses outside business. These courses would typically include:

CBA U101	Introduction to Business	4 SH
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CREDIT OUTSIDE BUSINESS

At least 64 semester hours must be earned in courses outside business.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

128 total semester hours required

Minimum 2.000 GPA required

FINANCE AND INSURANCE

The role of people trained in finance and insurance is expanding rapidly within the business world. Changes on the financial scene—rising securities prices, fluctuating inflation and interest rates, and scarcity of capital—have created an awareness that financial knowledge is essential to the effective management of business firms.

Finance is the management and investment of money and other assets for business, financial institutions, nonprofit organizations, governments, and individuals.

The program draws on accounting principles, economic theory, and quantitative methods to direct the way money is managed, acquired, and distributed. Students learn how economic systems operate and how money markets work within economic systems. They also learn to analyze economic trends and indications and to examine the movement and distribution of money.

Students may specialize in one or more of the following areas: management finance, investment management and analysis, management of financial institutions, insurance and risk management, real estate, and financial planning. The program prepares students for careers in financial management, security analysis, investment management, security or insurance brokerage, underwriting, credit management, and risk management with corporations, commerce banks, insurance companies, and other financial institutions. See pages 275–278 for course descriptions.

BSBA in Finance

COLLEGE OF BUSINESS ADMINISTRATION

BSBA CORE REQUIREMENTS

See page 140 for requirement list.

FINANCE MAJOR REQUIREMENTS

Required Courses

Complete the following two courses:

FIN U301	Corporate Finance	4 SH
FIN U303	Investments	4 SH

Elective Courses

Complete two additional FIN courses.

BUSINESS ELECTIVES OR SECOND BUSINESS CONCENTRATION

Complete four business electives (from departments ACC, ENT, FIN, HRM, INB, MGT, MIS, MKT, MSC, or SCM) or complete a second business concentration (different from that of your major) from the list “Second Business Concentrations” on page 148.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

ELECTIVES OUTSIDE BUSINESS

Complete six courses outside business. These courses would typically include:

CBA U101	Introduction to Business	4 SH
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CREDIT OUTSIDE BUSINESS

At least 64 semester hours must be earned in courses outside business.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

HUMAN RESOURCES MANAGEMENT

All organizations must acquire, develop, motivate, and retain employees. These tasks are often called human resource management (HRM)—the “people” side of organizations. Because people do the work of organizations—create the strategy, service customers, and build products—the success of an organization rests significantly on the quality of its HRM.

In recent years, several factors, including globalization of operations, diversity of the workforce, rapid technological change, and heightened competition, have increased the challenges to HRM. Simply put, more is expected of HRM. The role of yesterday’s HRM professional was viewed as primarily administrative. Today, in many organizations, the HRM professional is considered a “business partner”—adding value to business decisions and then aligning HR practices with those decisions.

HRM professionals must have expertise in many areas. Within HRM, they must understand complex compensation and benefit systems, apply labor relations law, forecast workforce needs, increase individual and organizational learning, and implement organizational change. Beyond HRM, they must possess broad-based business acumen so that they contribute to the business strategy and help manage operations.

BSBA in Human Resources Management

COLLEGE OF BUSINESS ADMINISTRATION

BSBA CORE REQUIREMENTS

See page 140 for requirement list.

HUMAN RESOURCE MANAGEMENT

MAJOR REQUIREMENTS

Required Courses

Complete the following three courses:

HRM U301	Introduction to Human Resources Management	4 SH
HRM U401	Building Your Management Skills	4 SH
HRM U501	Competitive HRM Practices	4 SH

Elective Course

Complete one course from the following list:

INB U310	Cultural Aspects of International Business	4 SH
MGT U320	Negotiation	4 SH

or any HRM course.

BUSINESS ELECTIVES OR SECOND BUSINESS CONCENTRATION

Complete four business electives (from departments ACC, ENT, FIN, HRM, INB, MGT, MIS, MKT, MSC, or SCM) or complete a second business concentration (different from that of your major) from the list “Second Business Concentrations” on page 148.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

ELECTIVES OUTSIDE BUSINESS

Complete six courses outside business. These courses would typically include:

CBA U101 Introduction to Business 4 SH

CREDIT OUTSIDE BUSINESS

At least 64 semester hours must be earned in courses outside business.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

128 total semester hours required
Minimum 2.000 GPA required

INTERNATIONAL BUSINESS ADMINISTRATION

The College of Business Administration is offering an innovative degree program, the Bachelor of Science in International Business (BSIB). This program, the first of its kind in the United States, is for the highly motivated student who plans a career in import/export, international finance, manufacturing, or other areas that involve global markets.

The growth of multinational firms, international trade, and regional international trading blocs has created a shortage of skilled managers who are equipped to analyze the complexities of international business.

The BSIB fosters an understanding of problems involved in operating businesses across national boundaries and analyzes the operations of businesses in multinational environments.

It is increasingly common for multinational firms to require that candidates for top management positions have prior experience in international operations. In addition, large banks and insurance companies, governments, trade associations, and transnational bodies also have a growing need for managers who understand international business issues.

The BSIB includes broad-based courses dealing with the international environment as well as functional business courses with an international focus.

Students are admitted to a French, Spanish, German, or English track. They develop fluency in their chosen language and study the culture of the country or countries where that language is spoken. In addition, they participate in at least one cooperative education work experience or internship abroad in order to sharpen their language and business skills. Students should contact the Bachelor of Science in International Business academic adviser for course schedules.

All students in the Bachelor of Science in International Business degree program must take the required courses

in the international business administration concentration (see page 144) and are encouraged to develop skills in other business areas such as finance, marketing, management, or human resources.

BSIB—Bachelor of Science in International Business**ENGLISH REQUIREMENT**

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

DIVERSITY

Complete one course from the list “Approved Courses: Diversity” on page 44.

INTERNATIONAL BUSINESS GENERAL EDUCATION REQUIREMENTS*Mathematics*

Complete one course from the following list:

MTH U131 Calculus for Business and Economics 4 SH

MTH U141 Calculus 1 4 SH

MTH U142 Calculus 2 4 SH

MTH U151 Calculus and Differential Equations 4 SH

for Biology 1

MTH U152 Calculus and Differential Equations 4 SH

for Biology 2

MTH U240 Intensive Calculus for Engineers 6 SH

MTH U241 Calculus 1 for Science and Engineering 4 SH

Statistics

Complete the following course:

MSC U201 Business Statistics 4 SH

Macro- and Microeconomics

Complete the following two courses:

ECN U115 Principles of Macroeconomics 4 SH

ECN U116 Principles of Microeconomics 4 SH

BUSINESS REQUIREMENTS*Accounting*

Complete the following two courses:

ACC U201 Financial Accounting and Reporting 4 SH

ACC U301 Managerial Accounting 4 SH

Marketing

Complete the following course:

MKT U201 Introduction to Marketing 4 SH

Finance

Complete the following course:

FIN U201 Financial Management 4 SH

Management Information Systems

Complete the following course:

MIS U301 Management Information Systems 4 SH

Operations Management

Complete the following course:

MSC U401 Operations Management 4 SH

Organizational Behavior

Complete the following course:

HRM U201 Organizational Behavior 4 SH

Strategic Management

Complete the following course:

MGT U501 Strategy in Action 4 SH

INTERNATIONAL BUSINESS MAJOR REQUIREMENTS

Complete the following four courses:

INB U201 Global Environment of International Business 4 SH

INB U301 Living and Working Abroad 4 SH

INB U310 Cultural Aspects of International Business 4 SH

INB U501 Advanced Global Management 4 SH

SECOND BUSINESS CONCENTRATION

Complete a second business concentration (different from that of your major) from the list "Second Business Concentrations" on page 148.

FOREIGN LANGUAGE REQUIREMENT

Note: Students who place out of introductory foreign language courses must substitute electives outside business so that the total of foreign language courses and electives outside business is eight courses.

International Business—Argentina, Chile, and Mexico

Complete the following six courses:

LNS U111 Elementary Spanish 1—BSIB 4 SH

LNS U112 Elementary Spanish 2—BSIB 4 SH

LNS U311 Intermediate Spanish 1—BSIB 4 SH

LNS U312 Intermediate Spanish 2—BSIB 4 SH

LNS U511 Advanced Spanish 1—BSIB 4 SH

LNS U512 Advanced Spanish 2—BSIB 4 SH

International Business—China

Complete the following six courses:

LNC U101 Elementary Chinese 1 4 SH

LNC U102 Elementary Chinese 2 4 SH

LNC U301 Chinese Conversation and Composition 1 4 SH

LNC U302 Chinese Conversation and Composition 2 4 SH

LNC U501 Advanced Chinese 1 4 SH

LNC U502 Advanced Chinese 2 4 SH

International Business—France

Complete the following six courses:

LNF U111 Elementary French 1—BSIB 4 SH

LNF U112 Elementary French 2—BSIB 4 SH

LNF U311 Intermediate French 1—BSIB 4 SH

LNF U312 Intermediate French 2—BSIB 4 SH

LNF U511 Advanced French 1—BSIB 4 SH

LNF U512 Advanced French 2—BSIB 4 SH

International Business—Germany

Complete the following six courses:

LNG U111 Elementary German 1—BSIB 4 SH

LNG U112 Elementary German 2—BSIB 4 SH

LNG U311 Intermediate German 1—BSIB 4 SH

LNG U312 Intermediate German 2—BSIB 4 SH

LNG U511 Advanced German 1—BSIB 4 SH

LNG U512 Advanced German 2—BSIB 4 SH

International Business—Ireland

Complete six courses in a foreign language with a minimum of one year in the same language. This option also requires a minor in international affairs. (See page 79.)

LNC U101 Elementary Chinese 1 4 SH

LNC U102 Elementary Chinese 2 4 SH

LNC U301 Chinese Conversation and Composition 1 4 SH

LNC U302 Chinese Conversation and Composition 2 4 SH

LNC U501 Advanced Chinese 1 4 SH

LNC U502 Advanced Chinese 2 4 SH

LNF U111 Elementary French 1—BSIB 4 SH

LNF U112 Elementary French 2—BSIB 4 SH

LNF U311 Intermediate French 1—BSIB 4 SH

LNF U312 Intermediate French 2—BSIB 4 SH

LNF U511 Advanced French 1—BSIB 4 SH

LNF U512 Advanced French 2—BSIB 4 SH

LNG U111 Elementary German 1—BSIB 4 SH

LNG U112 Elementary German 2—BSIB 4 SH

LNG U311 Intermediate German 1—BSIB 4 SH

LNG U312 Intermediate German 2—BSIB 4 SH

LNG U511 Advanced German 1—BSIB 4 SH

LNG U512 Advanced German 2—BSIB 4 SH

LNI U101 Elementary Italian 1 4 SH

LNI U102 Elementary Italian 2 4 SH

LNI U301 Italian Conversation and Composition 1 4 SH

LNI U302 Italian Conversation and Composition 2 4 SH

LNI U501 Advanced Italian 1 4 SH

LNI U502 Advanced Italian 2 4 SH

LNS U111 Elementary Spanish 1—BSIB 4 SH

LNS U112 Elementary Spanish 2—BSIB 4 SH

LNS U311 Intermediate Spanish 1—BSIB 4 SH

LNS U312 Intermediate Spanish 2—BSIB 4 SH

LNS U511 Advanced Spanish 1—BSIB 4 SH

LNS U512 Advanced Spanish 2—BSIB 4 SH

International Business—Italy

Complete the following six courses:

LNI U101 Elementary Italian 1 4 SH

LNI U102 Elementary Italian 2 4 SH

LNI U301 Italian Conversation and Composition 1 4 SH

LNI U302 Italian Conversation and Composition 2 4 SH

LNI U501 Advanced Italian 1 4 SH

LNI U502 Advanced Italian 2 4 SH

International Business—Spain

Complete the following six courses:

LNS U111 Elementary Spanish 1—BSIB 4 SH

LNS U112 Elementary Spanish 2—BSIB 4 SH

LNS U311 Intermediate Spanish 1—BSIB 4 SH

LNS U312 Intermediate Spanish 2—BSIB 4 SH

LNS U511 Advanced Spanish 1—BSIB 4 SH

LNS U512 Advanced Spanish 2—BSIB 4 SH

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

ELECTIVES OUTSIDE BUSINESS

Complete a minimum of three courses outside business. These courses would typically include:

CBA U101 Introduction to Business 4 SH

Note: Students who place out of introductory foreign language courses must substitute electives outside business so that the total of foreign language courses and electives outside business is eight courses. Students in the Ireland track must complete a minor in international affairs, see page 79.

CREDIT OUTSIDE BUSINESS

At least 64 semester hours must be earned in courses outside business.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

128 total semester hours required

Minimum 2.000 GPA required

MANAGEMENT

The concentration in management is designed for the student with a strong interest in motivating people to provide goods and services creatively and productively.

The program helps students understand the various aspects of administrative practice and develop judgment and skills in organizational problem analysis and decision making. It focuses on three functional areas—marketing, finance, and operations—and explores the interrelation of these areas and the ways they can be used as management tools. To these are added the perspectives of law, accounting, and management information systems. Finally, the concentration includes several courses on business policy that are intended to develop skills in both the integrative and strategic roles of management.

Through extensive use of case studies, management simulations, and group research projects, students develop leadership skills. Faculty pay significant attention to “people problems” in order to stress the importance of developing an effective workforce. See pages 326–327 for course descriptions.

BSBA in Management**COLLEGE OF BUSINESS ADMINISTRATION****BSBA CORE REQUIREMENTS**

See page 140 for requirement list.

MANAGEMENT MAJOR REQUIREMENTS*Required Courses*

Complete the following two courses:

INB U201 Global Environment of International Business 4 SH

MGT U301 Legal, Ethical, and Social Issues 4 SH

Elective Courses

Complete two additional MGT courses.

BUSINESS ELECTIVES OR SECOND BUSINESS CONCENTRATION

Complete four business electives (from departments ACC, ENT, FIN, HRM, INB, MGT, MIS, MKT, MSC, or SCM) or complete a second business concentration (different from that of your major) from the list “Second Business Concentrations” on page 148.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

ELECTIVES OUTSIDE BUSINESS

Complete six courses outside business. These courses would typically include:

CBA U101 Introduction to Business 4 SH

CREDIT OUTSIDE BUSINESS

At least 64 semester hours must be earned in courses outside business.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

128 total semester hours required

Minimum 2.000 GPA required

MANAGEMENT INFORMATION SYSTEMS

Businesses process materials, products, and information. In the industrial era of the past, management of materials and products was the focus. In the Information Age, success, for individuals and for companies, requires the ability to manage information effectively.

The goal of the management information systems (MIS) concentration is to teach future managers and analysts how to use information technology (IT) to help individuals and organizations perform more efficiently and effectively. Students develop new, cutting-edge approaches that allow them to use this powerful resource to its greatest advantage. Delivering the right information in the right form and format to the right people at the right time is essential in today’s business world. Companies use MIS to achieve a competitive edge through the

intelligent design and use of IT. Students study database management, telecommunications, systems analysis and design, program design methodologies, and other IT topics, such as digital multimedia, expert systems, electronic business, and knowledge management.

MIS can only be effectively designed and implemented when understood in the context of the individual user, the work group, the organization, and society. Therefore, the study of MIS at Northeastern combines a focus on technology with a focus on organizational systems within the business context. Not only do students develop technical and problem-solving skills that are in high demand by employers, they learn to identify how IT can best be used within a business organization.

MIS managers interact frequently with other managers throughout an organization; therefore, students are encouraged to complete a dual concentration in MIS and another area of business. Graduates of this program enter a wide range of professions that suit their particular interests. Professional options include systems analyst, programmer, database designer and administrator, Webmaster, software help-desk expert, project specialist, consultant, network administrator, and IT specialist within other departments, such as financial services, accounting, marketing, or manufacturing. See pages 332–333 for course descriptions.

BSBA in Management Information Systems

COLLEGE OF BUSINESS ADMINISTRATION
BSBA CORE REQUIREMENTS
See page 140 for requirement list.

MANAGEMENT INFORMATION SYSTEMS MAJOR REQUIREMENTS

Required Courses

Complete the following three courses:

MIS U305	Information Resource Management	4 SH
MIS U403	Data Management and Information Analysis	4 SH
MIS U501	Business Systems Integration	4 SH

Elective Course

Complete one additional MIS course.

BUSINESS ELECTIVES OR SECOND BUSINESS CONCENTRATION

Complete four business electives (from departments ACC, ENT, FIN, HRM, INB, MGT, MIS, MKT, MSC, or SCM) or complete a second business concentration (different from that of your major) from the list “Second Business Concentrations” on page 148.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

ELECTIVES OUTSIDE BUSINESS

Complete six courses outside business. These courses would typically include:

CBA U101	Introduction to Business	4 SH
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CREDIT OUTSIDE BUSINESS

At least 64 semester hours must be earned in courses outside business.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

MARKETING

A business not only designs and manufactures products, but also markets and sells them to manufacturers, wholesalers, retailers, and consumers. All the activities that direct the flow of goods and services from producer to consumer are classified as marketing concerns. Once an organization determines a customer's needs and wants, its first objective is to produce goods or services to satisfy that particular customer. Essential in all types of businesses are product design, research, pricing, packaging, transportation, advertising, selling, and servicing.

The concentration in marketing is designed to familiarize students with the marketing process and to provide them with the theoretical concepts, skills, and tools necessary to enter and advance successfully in one of the many possible career paths. Students learn to evaluate consumer behavior, employ advertising principles, utilize market research and testing, and develop ways to position products and services in a favorable light. They also explore the changing economic, political, legal, ethical, and cultural contexts in which marketing strategies must be developed.

Students may select courses that lead to one of many career paths within marketing: product or brand management, marketing research, advertising management, retail management, sales management, or international marketing management. See pages 333–335 for course descriptions.

BSBA in Marketing

COLLEGE OF BUSINESS ADMINISTRATION
BSBA CORE REQUIREMENTS
See page 140 for requirement list.

MARKETING MAJOR REQUIREMENTS

Required Courses

Complete the following two courses:

MKT U301	Marketing Management	4 SH
MKT U401	Marketing Research	4 SH

Elective Courses

Complete two additional MKT courses.

BUSINESS ELECTIVES OR SECOND BUSINESS CONCENTRATION

Complete four business electives (from departments ACC, ENT, FIN, HRM, INB, MGT, MIS, MKT, MSC, or SCM) or complete a second business concentration (different from that of your major) from the list “Second Business Concentrations” on page 148.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

ELECTIVES OUTSIDE BUSINESS

Complete six courses outside business. These courses would typically include:

CBA U101 Introduction to Business 4 SH

CREDIT OUTSIDE BUSINESS

At least 64 semester hours must be earned in courses outside business.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

128 total semester hours required

Minimum 2.000 GPA required

SUPPLY CHAIN MANAGEMENT

From the *Fortune* 500 manufacturer to the small firm that produces, sells, or distributes products, all such companies have a supply chain management function that must be effectively managed if they are to be competitive. A supply chain manager is typically involved in making critical decisions about such matters as the modes of transportation used to move the company's materials and products, inventory policies, warehousing needs, customer service standards, and the location of facilities.

As companies become increasingly involved in global markets as both buyers and sellers, supply chain managers play a major role not only in assessing the feasibility of international activity, but also in developing supply and distribution networks to support that involvement. The policies that these managers help formulate are major determinants of a company's success in the international arena.

The academic work of the program flows from introductory courses that address the decisions outlined above through advanced study of the formulation of supply chain strategies. The program culminates in a senior seminar that not only introduces the students to industry leaders in the field, but also focuses on development of individual research and presentation skills.

Because supply chain managers frequently interact with those involved in other areas of management, many supply chain management students have chosen to complete a second

concentration in such areas as marketing, finance, or international business.

In addition to finding career opportunities with manufacturers, retailers, and distributors, supply chain management students may find similar opportunities with companies that sell supply chain services or transportation services in the marketplace. Consulting firms and government agencies at the federal, state, and local levels provide other career options. See pages 385–386 for course descriptions.

BSBA in Supply Chain Management**COLLEGE OF BUSINESS ADMINISTRATION****BSBA CORE REQUIREMENTS**

See page 140 for requirement list.

SUPPLY CHAIN MANAGEMENT MAJOR REQUIREMENTS*Required Courses*

Complete the following three courses:

SCM U201	Supply Chain Management	4 SH
SCM U301	Global Supply Chain Management	4 SH
SCM U401	Advanced Problems in Supply Chain Management	4 SH

Elective Course

Complete one of the following elective courses:

SCM U310	The Transportation Industries	4 SH
SCM U312	Current Issues in Supply Chain Management	4 SH
MGT U320	Negotiation	4 SH
MIS U305	Information Resource Management	4 SH
MIS U403	Data Management and Information Analysis	4 SH
INB U201	Global Environment of International Business	4 SH

BUSINESS ELECTIVES OR SECOND BUSINESS CONCENTRATION

Complete four business electives (from departments ACC, ENT, FIN, HRM, INB, MGT, MIS, MKT, MSC, or SCM) or complete a second business concentration (different from that of your major) from the list “Second Business Concentrations” on page 148.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

ELECTIVES OUTSIDE BUSINESS

Complete six courses outside business. These courses would typically include:

CBA U101 Introduction to Business 4 SH

CREDIT OUTSIDE BUSINESS

At least 64 semester hours must be earned in courses outside business.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Second Business Concentrations

The College of Business Administration departmental listings, which begin on page 140, give the detailed requirements for each degree offered by the college. Each of these detailed requirement listings in turn references the business concentrations shown below.

ACCOUNTING CONCENTRATION

Required Courses

Complete the following three courses:

ACC U401	Financial Reporting and Analysis 1	4 SH
ACC U403	Accounting Information Systems	4 SH
ACC U501	Financial Reporting and Analysis 2	4 SH

Elective Course

Complete one additional ACC course.

ENTREPRENEURSHIP AND SMALL BUSINESS
MANAGEMENT CONCENTRATION*Required Courses*

Complete the following four courses:

ENT U201	Entrepreneurship	4 SH
ENT U301	Opportunity Assessment and Entrepreneurial Market	4 SH
ENT U401	Management of Small and Medium Enterprises	4 SH
ENT U501	Growth Venture Creation	4 SH

FINANCE CONCENTRATION

Required Courses

Complete the following two courses:

FIN U301	Corporate Finance	4 SH
FIN U303	Investments	4 SH

Elective Courses

Complete two additional FIN courses.

HUMAN RESOURCE MANAGEMENT
CONCENTRATION*Required Courses*

Complete the following three courses:

HRM U301	Introduction to Human Resources Management	4 SH
HRM U401	Building Your Management Skills	4 SH
HRM U501	Competitive HRM Practices	4 SH

Elective Course

Complete one course from the following list:

INB U310	Cultural Aspects of International Business	4 SH
MGT U320	Negotiation	4 SH

or any HRM course.

MANAGEMENT CONCENTRATION

Required Courses

Complete the following two courses:

INB U201	Global Environment of International Business	4 SH
MGT U301	Legal, Ethical, and Social Issues	4 SH

Elective Courses

Complete two additional MGT courses.

MANAGEMENT INFORMATION SYSTEMS
CONCENTRATION*Required Courses*

Complete the following three courses:

MIS U305	Information Resource Management	4 SH
MIS U403	Data Management and Information Analysis	4 SH
MIS U501	Business Systems Integration	4 SH

Elective Course

Complete one additional MIS course.

MARKETING CONCENTRATION

Required Courses

Complete the following two courses:

MKT U301	Marketing Management	4 SH
MKT U401	Marketing Research	4 SH

Elective Courses

Complete two additional MKT courses.

SUPPLY CHAIN MANAGEMENT CONCENTRATION

Required Courses

Complete the following three courses:

SCM U201	Supply Chain Management	4 SH
SCM U301	Global Supply Chain Management	4 SH
SCM U401	Advanced Problems in Supply Chain Management	4 SH

Elective Course

Complete one of the following elective courses:

SCM U310	The Transportation Industries	4 SH
SCM U312	Current Issues in Supply Chain Management	4 SH
MGT U320	Negotiation	4 SH
MIS U305	Information Resource Management	4 SH
MIS U403	Data Management and Information Analysis	4 SH
INB U201	Global Environment of International Business	4 SH

College of Computer and Information Science

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The invention of powerful computers and the development of complex software programs have fundamentally transformed the way people work and live. Computers are now essential tools in business, industry, science, medicine, and human services. Computers also enhance the efforts of individuals and volunteer groups to meet their goals. In addition, the most sophisticated work in music, film, and video often makes use of computer technology. The College of Computer and Information Science believes that computing is one of the most exciting fields of study and that its applications are limitless.

The college offers undergraduate degree programs in computer science (BS and BA) and information science (BS), and three dual majors with cognitive psychology, mathematics, and physics. The BS in computer science emphasizes strong technical competence in computer science, mathematics, science, and electrical engineering while the BA in computer science combines computer science with a broad-based liberal arts education. The BS in information science integrates studies in computer science, information science, business, psychology, and social science. Each of the dual majors offers the opportunity for intense study in two disciplines. The BS in computer science follows the ACM-IEEE Curriculum 2001 recommendations and is accredited by the Computing Accreditation Commission of ABET.

Computer Science

Computer science involves the application of theoretical concepts in the context of software development to the solution of problems that arise in almost every human endeavor. Computer science as a discipline draws its inspiration from mathematics, logic, science, and engineering. From these roots, computer science has fashioned paradigms for program structures, for algorithms, for data representations, for efficient use of computational resources, for robustness and security, and for communication within computers and across networks. The ability to frame problems, select computational models, design program structures, and develop efficient algorithms is as important in computer science as software implementation skill. Computer science is concerned with bringing together all of the intellectual resources needed to enable the rapid and effective development of software to meet the needs of business, research, and end users.

The goal of the undergraduate program in computer science is to teach students the conceptual and practical skills that will enable them to contribute to the development of computational principles and to play a productive role in the software community. To that end, the undergraduate program focuses on the fundamentals of program design including object-

oriented design, on software development, on computer organization, on systems and networks, on theory of computation, on principles of languages, and on advanced algorithms and data. The program also offers a variety of electives at the upper undergraduate and beginning graduate levels ranging from more theoretical courses to those that focus on important applications.

BSCS—Bachelor of Science in Computer Science

ENGLISH REQUIREMENT

Complete the following two courses with a grade of C or higher:

ENG U111	College Writing	4 SH
ENG U302	Advanced Writing in the Technical Professions	4 SH

DIVERSITY

Diversity Course

Complete one course from the list “Approved Courses: Diversity” on page 44.

Or Residence Abroad

Provide documentation that you lived in a country other than the United States or Canada for at least two years after your tenth birthday.

Or International Co-Op/Study Abroad

Participate in a six-month international co-op assignment or study-abroad program in a country other than Canada.

Or Community Service

Complete one hundred hours of preapproved diversity-related community service and file a report describing the work done.

COMPUTER SCIENCE

BEHAVIORAL CORE REQUIREMENTS

Arts, Humanities, and Social Science

Complete two courses from any department in the following list: AFR, ARC, ART, COM, ECN, ED, ENG, HST, JRN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MUS, PHL, POL, PSY, SOA, SOC, or THE.

“Approved Courses: Methods of Inquiry—Arts Context” on page 43.

“Approved Courses: Methods of Inquiry—Humanities Context” on page 43.

“Approved Courses: Methods of Inquiry—Social World Context” on page 43.

Sociology

Complete the following course:

SOC U528	Computers and Society	4 SH
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Elective Courses

Complete a total of six electives that meet one of the following two constraints: (a) at least three courses in the arts, humanities, and/or social sciences OR (b) at least three courses in one discipline outside CS/IS with at least one course at the intermediate level (300 level or above).

COMPUTER SCIENCE

MATHEMATICS AND SCIENCE CORE REQUIREMENTS FOR BS

Mathematics Courses

Complete the following four courses. A grade of C– or higher is required in MTH U241 and MTH U242.

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U371	Linear Algebra	4 SH
MTH U481	Probability and Statistics	4 SH

Science Courses

Complete a pair of courses with corresponding labs (and recitations if applicable) for any of the following science groups:

BIOLOGY

BIO U101	Principles of Biology 1	4 SH
with BIO U102	Lab for BIO U101	1 SH
BIO U103	Principles of Biology 2	4 SH
with BIO U104	Lab for BIO U103	1 SH

CHEMISTRY

CHM U211	General Chemistry 1	5 SH
with CHM U212	Lab for CHM U211	0 SH
CHM U214	General Chemistry 2	5 SH
with CHM U215	Lab for CHM U214	0 SH

GEOLOGY

GEO U200	Dynamic Earth	4 SH
with GEO U201	Lab for GEO U200	1 SH
GEO U220	History of Earth and Life	4 SH
with GEO U221	Interpreting Earth History	1 SH

PHYSICS

PHY U161	Physics 1	5 SH
with PHY U162	Lab for PHY U161	0 SH
PHY U165	Physics 2	5 SH
with PHY U166	Lab for PHY U165	0 SH

Philosophy Course

Complete the following course with a grade of C– or higher:

PHL U215	Symbolic Logic	4 SH
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Electrical Engineering

Complete the following course:

ECE U230	Computer Architecture for Computer Scientists	4 SH
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COMPUTER SCIENCE MAJOR

Computer Science Overview

Freshmen or freshmen transfers must complete the following two courses:

CS U221	Computer/Information Science Overview 1	1 SH
CS U222	Computer/Information Science Overview 2	1 SH

Upper-level transfer students must complete the following course:

CS U223	Computer/Information Science Co-op Preparation	1 SH
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and must also make up the 1 SH missed by not taking CS U221.

Computer Science Fundamental Courses

Complete the following three courses with a grade of C– or higher:

CS U200	Discrete Structures	4 SH
CS U211	Fundamentals of Computer Science 1	4 SH
CS U212	Fundamentals of Computer Science 2	4 SH

Computer Science Required Courses

Complete the following seven courses:

CS U370	Object-Oriented Design	4 SH
CS U380	Computer Organization	4 SH
CS U390	Theory of Computation	4 SH
CS U480	Systems and Networks	4 SH
CS U660	Programming Languages	4 SH
CS U670	Software Development	4 SH
CS U690	Algorithms and Data	4 SH

Computer Science Elective Courses

Choose three courses from the following list:

CS U430	Database Design	4 SH
CS U520	Artificial Intelligence	4 SH
CS U540	Computer Graphics	4 SH
CS U650	Topics in Computer Networks	4 SH
CS U665	Compilers	4 SH
CS U680	Topics in Operating Systems	4 SH
IS U535	Information Retrieval	4 SH
IS U570	Human Computer Interaction	4 SH

With department approval, directed study courses, project courses, and appropriate graduate-level courses may also be taken as computer science electives.

Computer Science Capstone

The computer science capstone is an extended activity that demands a significant individual effort, although it may be a team project as long as each student contributes substantial work. It generally consists of (1) a substantial programming or design project of at least one month in duration or (2) a research survey project in which the student explores and critically analyzes material beyond what is covered in a course and prepares a document to disseminate publicly what is learned to other members of the college. The requirement is usually satisfied through an elective course that is designated as a “capstone course” (a course whose normal requirements satisfy the capstone requirement) or as a “capstone-enabled course” (a course in which either there is a course project satisfying the capstone guidelines or in which the students may arrange a special project with permission of the instructor that will satisfy the capstone guidelines). See the department for a list of “capstone courses” and “capstone-enabled courses.”

Computer Science Senior Seminar

Complete one senior seminar:

CS U600	Senior Seminar	1 SH
or CS U610	Honors Senior Seminar	4 SH

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in all CS and IS courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

133 total semester hours required

Minimum 2.000 GPA required

BACS—Bachelor of Arts in Computer Science**BA CORE REQUIREMENTS****English Requirement**

Complete the following two courses with a grade of C or higher:

ENG U111	College Writing	4 SH
ENG U302	Advanced Writing in the Technical Professions	4 SH

Foreign Language

Complete two courses in the same language. Proficiency at elementary-level two or higher is required.

Methods of Inquiry

Complete one course for each of the contexts below. Note: Courses in the major may not be used.

ARTS CONTEXT

Complete one course from the list “Approved Courses: Methods of Inquiry—Arts Context” on page 43.

HUMANITIES CONTEXT

Complete the following course with a grade of C– or higher:

PHL U215	Symbolic Logic	4 SH
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SOCIAL WORLD CONTEXT

Complete one course from the list “Approved Courses: Methods of Inquiry—Social World Context” on page 43.

Diversity

Complete two courses from the list “Approved Courses: Diversity” on page 44.

Historical, Ethical, and Aesthetic Perspectives

Complete two courses from the list “Approved Courses: Historical, Ethical, and Aesthetic Perspectives” on page 44.

Analysis

Complete the following course:

SOC U528	Computers and Society	4 SH
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MATHEMATICS AND SCIENCE CORE**Mathematics Courses**

Complete the following three courses. A grade of C– or higher is required in MTH U241 and MTH U242.

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U481	Probability and Statistics	4 SH

Science Courses

Complete one course with corresponding lab (and recitation if applicable) for any of the following science groups:

BIOLOGY

BIO U101 Principles of Biology 1 4 SH
with **BIO U102 Lab for BIO U101** 1 SH

CHEMISTRY

CHM U211 General Chemistry 1 5 SH
with **CHM U212 Lab for CHM U211** 0 SH
and **CHM U213 Recitation for CHM U211** 0 SH

GEOLOGY

GEO U200 Dynamic Earth 4 SH
with **GEO U201 Lab for GEO U200** 1 SH
or **GEO U220 History of Earth and Life** 4 SH
with **GEO U221 Interpreting Earth History** 1 SH

PHYSICS

PHY U161 Physics 1 5 SH
with **PHY U162 Lab for PHY U161** 0 SH

COMPUTER SCIENCE MAJOR*Computer Science Overview*

Freshmen or freshmen transfers must complete the following two courses:

CS U221 Computer/Information Science Overview 1 1 SH
CS U222 Computer/Information Science Overview 2 1 SH

Upper-level transfer students must complete the following course:

CS U223 Computer/Information Science Co-op Preparation 1 SH

and must also make up the 1 SH missed by not taking CS U221.

Computer Science Fundamental Courses

Complete the following three courses with a grade of C- or higher:

CS U200 Discrete Structures 4 SH
CS U211 Fundamentals of Computer Science 1 4 SH
CS U212 Fundamentals of Computer Science 2 4 SH

Computer Science Required Courses

Complete the following six courses:

CS U370 Object-Oriented Design 4 SH
CS U380 Computer Organization 4 SH
CS U390 Theory of Computation 4 SH
CS U480 Systems and Networks 4 SH
CS U670 Software Development 4 SH
CS U690 Algorithms and Data 4 SH

Computer Science Elective Courses

Choose two upper-division courses from either the CS, IS, or MTH departments. Note: Only one course can count from the MTH department.

CS U300 to CS U699

IS U300 to IS U699

MTH U300 to MTH U699

With adviser approval, directed study courses, project courses, and appropriate graduate-level courses may also be taken as computer science electives.

Computer Science Senior Seminar

Complete one senior seminar:

CS U600 Senior Seminar 1 SH
or **CS U610 Honors Senior Seminar** 4 SH

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in all CS and IS courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

132 total semester hours required

Minimum 2.000 GPA required

Minor in Computer Science

The requirements for the minor in computer science are shown below. Students who wish to take a particular course must have taken its prerequisites listed in the catalog.

REQUIRED COURSES

Complete the following two courses with a grade of C- or higher:

CS U211 Fundamentals of Computer Science 1 4 SH
CS U212 Fundamentals of Computer Science 2 4 SH

COMPUTER SCIENCE ELECTIVES

Choose three courses from the following list:

CS U300 to CS U699

IS U535 Information Retrieval 4 SH
IS U570 Human Computer Interaction 4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Information Science

Making the most of information technology—ensuring that it serves the goals and needs of users, clients, and society—is a tremendous challenge, one that requires a unique blend of knowledge and skills. The field of information science (IS) focuses on the relationship among computers, the people who use them, and the environments in which they operate.

IS seeks to further our understanding of: 1) information itself: where it comes from, how it is organized, and how it is used; 2) the design of computer applications that are usable, socially acceptable, and achieve the goals for which they were created; 3) the impact of information technology (IT) on human life and work; and 4) how the nature of the information, the goals of the users, and the relevant social policies and laws both influence and are influenced by the technical aspects of computer systems.

Information science majors acquire a strong technical foundation by taking classes in mathematics, logic, and computer science. They also require a strong foundation in behavioral science by taking classes in cognitive psychology, organizational behavior, and statistics. A course in the principles

of information science introduces students to important intellectual frameworks such as decision theory, general systems theory, and social informatics, and to topics of current importance such as digital copyright, trusted systems, and Internet privacy policy. Building on these foundations, the IS core develops expertise in the design, management, and evaluation of information-technology-based resources and systems. Elective courses cover topics such as text/hypertext retrieval, artificial intelligence, e-commerce, and data mining.

BSIS—Bachelor of Science in Information Science

ENGLISH REQUIREMENT

Complete the following two courses with a grade of C or higher:

ENG U111	College Writing	4 SH
ENG U302	Advanced Writing in the Technical Professions	4 SH

DIVERSITY

Diversity Course

Complete one course from the list “Approved Courses: Diversity” on page 44.

Or Residence Abroad

Provide documentation that you lived in a country other than the United States or Canada for at least two years after your tenth birthday.

Or International Co-Op/Study Abroad

Participate in a six-month international co-op assignment or study-abroad program in a country other than Canada.

Or Community Service

Complete one hundred hours of preapproved diversity-related community service and file a report describing the work done.

INFORMATION SCIENCE GENERAL REQUIREMENTS

Arts, Humanities, and Social Science

Complete two courses from any department in the following list: AFR, ARC, ART, COM, ECN, ED, ENG, HST, JRN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MUS, PHL, POL, PSY, SOA, SOC, or THE.

Elective Courses

Complete a total of four elective courses.

INFORMATION SCIENCE

BEHAVIORAL SCIENCE FOUNDATIONS

Psychology Courses

Complete the following two courses:

PSY U101	Foundations of Psychology	4 SH
PSY U466	Cognition	4 SH

Business Course

Complete the following course:

HRM U201	Organizational Behavior	4 SH
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Economics Course

Complete the following course:

ECN U116	Principles of Microeconomics	4 SH
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INFORMATION SCIENCE MATHEMATICS AND SCIENCE

Calculus and Statistics

Complete the following two courses. A grade of C– or higher is required in MTH U241.

MTH U241	Calculus 1 for Science and Engineering	4 SH
ECN U350	Statistics	4 SH

Philosophy Course

Complete the following course with a grade of C– or higher:

PHL U215	Symbolic Logic	4 SH
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Science Elective

Complete one course from the list “Approved Courses:

Methods of Inquiry—Natural World Context” on page 43,

or complete one course with corresponding lab (and recitation if applicable) for any of the following science groups:

BIOLOGY

BIO U101	Principles of Biology 1	4 SH
with BIO U102	Lab for BIO U101	1 SH

CHEMISTRY

CHM U211	General Chemistry 1	5 SH
with CHM U212	Lab for CHM U211	0 SH

GEOLOGY

GEO U200	Dynamic Earth	4 SH
with GEO U201	Lab for GEO U200	1 SH

or

GEO U220	History of Earth and Life	4 SH
with GEO U221	Interpreting Earth History	1 SH

PHYSICS

PHY U161	Physics 1	5 SH
with PHY U162	Lab for PHY U161	0 SH

COMPUTER SCIENCE FOUNDATIONAL COURSES

Computer Science Overview

Freshmen or freshmen transfers must complete the following two courses:

CS U221	Computer/Information Science Overview 1	1 SH
CS U222	Computer/Information Science Overview 2	1 SH

Upper-level transfer students must complete the following course:

CS U223	Computer/Information Science Co-op Preparation	1 SH
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and must also make up the 1 SH missed by not taking CS U221.

Computer Science Fundamental Courses

Complete the following three courses with a grade of C– or higher:

CS U200	Discrete Structures	4 SH
CS U211	Fundamentals of Computer Science 1	4 SH
CS U212	Fundamentals of Computer Science 2	4 SH

Computer Science Required Courses

Complete the following two courses:

CS U370	Object-Oriented Design	4 SH
CS U380	Computer Organization	4 SH

INFORMATION SCIENCE COURSES

Information Science Required Courses

Complete the following six courses:

IS U300	Principles of Information Science	4 SH
IS U470	Information System Design and Development	4 SH
IS U570	Human Computer Interaction	4 SH
IS U580	Empirical Research Methods	4 SH
IS U691	Information Science Field Study	1 SH
IS U692	Information Science Senior Project	5 SH

Additional Computer Science Required Courses

Complete the following two courses:

CS U430	Database Design	4 SH
CS U480	Systems and Networks	4 SH

Sociology

Complete the following course:

SOC U528	Computers and Society	4 SH
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Managing Information

Complete the following course:

MIS U305	Information Resource Management	4 SH
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Information Science Electives

Choose two courses from the following list:

Any IS courses at the IS U300 level or above, or any CS courses at the CS U300 level or above, or:

MIS U408	Knowledge Management	4 SH
MIS U501	Business Systems Integration	4 SH
ACC U201	Financial Accounting and Reporting	4 SH
ACC U403	Accounting Information Systems	4 SH
ECN U560	Applied Econometrics	4 SH
CMN U231	Principles of Organizational Communication	4 SH
CMN U531	Advanced Organizational Communication	4 SH
CMN U532	Theories of Conflict and Negotiation	4 SH
PSY U450	Learning and Motivation	4 SH
PSY U452	Introduction to Sensation and Perception	4 SH
PSY U458	Psychobiology	4 SH
PSY U604	Laboratory in Learning and Motivation	4 SH
PSY U606	Laboratory in Psychobiology	4 SH
PSY U612	Laboratory in Cognition	4 SH
PSY U622	Laboratory in Sensation and Perception	4 SH
LIN U464	Psychology of Language	4 SH
or PSY U464	Psychology of Language	4 SH
LIN U520	Language and the Brain	4 SH
or PSY U520	Language and the Brain	4 SH
LIN U610	Laboratory in Psycholinguistics	4 SH
or PSY U610	Laboratory in Psycholinguistics	4 SH
LIN U450	Syntax	4 SH
or ENG U450	Syntax	4 SH
LIN U452	Semantics	4 SH
or ENG U452	Semantics	4 SH

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in all CS and IS courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

132 total semester hours required

Minimum 2.000 GPA required

Minor in Information Science

The requirements for the minor in information science are shown below. Students who wish to take a particular course must have taken its prerequisites listed in the catalog.

Minor in Information Science

REQUIRED COURSES

Complete the following three courses with a grade of C- or higher:

CS U211	Fundamentals of Computer Science 1	4 SH
CS U212	Fundamentals of Computer Science 2	4 SH
IS U300	Principles of Information Science	4 SH

INFORMATION SCIENCE ELECTIVES

Choose two courses from the following list:

IS U300 to IS U699		
CS U430	Database Design	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Dual Majors

The college offers three dual majors with cognitive psychology, mathematics, and physics. Each of the dual majors offers the opportunity for intense study in two disciplines with appropriate breadth in the liberal arts. Students take eight to ten courses in each discipline and two or three integrative courses that bind the disciplines together. These programs offer an excellent educational opportunity for the ambitious student.

BS in Computer Science and Cognitive Psychology

BS CORE REQUIREMENTS

English Requirement

Complete the following two courses with a grade of C or higher:

ENG U111	College Writing	4 SH
ENG U302	Advanced Writing in the Technical Professions	4 SH

Mathematics

Complete the following course with a grade of C- or higher:

MTH U241	Calculus 1 for Science and Engineering	4 SH
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Methods of Inquiry

Courses from your major cannot count toward the core.

Choose one course from one of the following contexts:

ARTS CONTEXT

Choose from the list “Approved Courses: Methods of Inquiry—Arts Context” on page 43.

HUMANITIES CONTEXT

A grade of C– or higher is required in the following course:

PHL U215 Symbolic Logic 4 SH

NATURAL WORLD CONTEXT

Choose from the list “Approved Courses: Methods of Inquiry—Natural World Context” on page 43.

SOCIAL WORLD CONTEXT

Choose from the list “Approved Courses: Methods of Inquiry—Social World Context” on page 43.

Diversity

Complete one course from the list “Approved Courses: Diversity” on page 44.

Historical, Ethical, and Aesthetic Perspectives

Complete one course from the list “Approved Courses: Historical, Ethical, and Aesthetic Perspectives” on page 44.

Analysis

Complete the following course:

SOC U528 Computers and Society 4 SH

PSYCHOLOGY COURSES*Required Courses*

Complete the following four courses (with associated lab if applicable):

PSY U101 Foundations of Psychology 4 SH

PSY U320 Statistics in Psychological Research 5 SH

with PSY U321 Lab for PSY U320 0 SH

PSY U464 Psychology of Language 4 SH

PSY U466 Cognition 4 SH

Advanced Psychology

Choose one course from the following list:

PSY U452 Introduction to Sensation and Perception 4 SH

PSY U458 Psychobiology 4 SH

Laboratory in Psychology

Choose one course from the following list:

PSY U610 Laboratory in Psycholinguistics 4 SH

PSY U612 Laboratory in Cognition 4 SH

PSY U622 Laboratory in Sensation and Perception 4 SH

Seminar in Psychology

Choose one course from the following list:

PSY U658 Seminar in Psycholinguistics 4 SH

PSY U660 Seminar in Cognition 4 SH

PSY U668 Seminar in Sensation and Perception 4 SH

Psychology Electives

Choose two courses from the following list:

PSY U450 Learning and Motivation 4 SH

PSY U452 Introduction to Sensation and Perception 4 SH

PSY U458 Psychobiology 4 SH

PSY U520 Language and the Brain 4 SH

PSY U522 Psychology of Reading 4 SH

PSY U524 Language and Cognitive Development 4 SH

PSY U526 Categorization and Reasoning 4 SH

PSY U610 Laboratory in Psycholinguistics 4 SH

PSY U612 Laboratory in Cognition 4 SH

PSY U622 Laboratory in Sensation and Perception 4 SH

PSY U652 Seminar in Ethics in Psychology 4 SH

PSY U658 Seminar in Psycholinguistics 4 SH

PSY U660 Seminar in Cognition 4 SH

PSY U668 Seminar in Sensation and Perception 4 SH

COMPUTER SCIENCE COURSES*Computer Science Overview*

Freshmen or freshmen transfers must complete the following two courses:

CS U221 Computer/Information Science Overview 1 1 SH

CS U222 Computer/Information Science Overview 2 1 SH

Upper-level transfer students must complete the following course:

CS U223 Computer/Information Science Co-op Preparation 1 SH

and must also make up the 1 SH missed by not taking CS U221.

Computer Science Fundamental Courses

Complete the following three courses with a grade of C– or higher:

CS U200 Discrete Structures 4 SH

CS U211 Fundamentals of Computer Science 1 4 SH

CS U212 Fundamentals of Computer Science 2 4 SH

Computer Science Required Courses

Complete the following four courses:

CS U370 Object-Oriented Design 4 SH

CS U390 Theory of Computation 4 SH

CS U520 Artificial Intelligence 4 SH

IS U570 Human Computer Interaction 4 SH

Computer Science Senior Seminar

Complete one senior seminar:

CS U600 Senior Seminar 1 SH

or CS U610 Honors Senior Seminar 4 SH

Integrative Courses

Choose either the following course:

CS U670 Software Development 4 SH

or both of the following courses:

PSY U970 Junior/Senior Project 1 4 SH

PSY U971 Junior/Senior Project 2 4 SH

Computer Science Elective Courses

Complete two upper-division courses from the CS department, CS U300 to CS U699.

With department approval, directed study courses, project courses, and appropriate graduate-level courses may also be taken as computer science electives.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in all CS and IS courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

132 total semester hours required

Minimum 2.000 GPA required

BS in Computer Science and Mathematics**BS CORE REQUIREMENTS***English Requirement*

Complete the following two courses with a grade of C or higher:

ENG U111 College Writing 4 SH

ENG U302 Advanced Writing in the Technical Professions 4 SH

Mathematics

Requirement satisfied through the major.

Methods of Inquiry

Courses from your major cannot count toward the core.

Choose one course from one of the following contexts:

ARTS CONTEXT

Choose from the list “Approved Courses: Methods of Inquiry—Arts Context” on page 43.

HUMANITIES CONTEXT

A grade of C– or higher is required in the following course:

PHL U215 Symbolic Logic 4 SH

NATURAL WORLD CONTEXT

Choose from the list “Approved Courses: Methods of Inquiry—Natural World Context” on page 43.

SOCIAL WORLD CONTEXT

Choose from the list “Approved Courses: Methods of Inquiry—Social World Context” on page 43.

Diversity

Complete one course from the list “Approved Courses: Diversity” on page 44.

Historical, Ethical, and Aesthetic Perspectives

Complete one course from the list “Approved Courses: Historical, Ethical, and Aesthetic Perspectives” on page 44.

Analysis

Complete the following course:

SOC U528 Computers and Society 4 SH

MATHEMATICS COURSES*Calculus Courses*

Complete the following three courses. A grade of C– or higher is required in MTH U241 and MTH U242.

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U242 Calculus 2 for Science and Engineering 4 SH

MTH U341 Calculus 3 for Science and Engineering 4 SH

Mathematics Courses

Complete the following five courses:

MTH U345 Ordinary Differential Equations 4 SH

MTH U371 Linear Algebra 4 SH

MTH U430 Number Theory 4 SH

MTH U481 Probability and Statistics 4 SH

MTH U575 Group Theory 4 SH

Co-op Seminar

Complete the following two courses:

MTH U300 Co-op Reflections Seminar 1 1 SH

MTH U400 Co-op Reflections Seminar 2 1 SH

Mathematics Electives

Choose two upper-division courses from the MTH department, MTH U300 to MTH U699.

COMPUTER SCIENCE COURSES*Computer Science Overview*

Freshmen or freshmen transfers must complete the following two courses:

CS U221 Computer/Information Science Overview 1 1 SH

CS U222 Computer/Information Science Overview 2 1 SH

Upper-level transfer students must complete the following course:

CS U223 Computer/Information Science Co-op Preparation 1 SH

and must also make up the 1 SH missed by not taking CS U221.

Computer Science Fundamental Courses

Complete the following three courses with a grade of C– or higher:

CS U200 Discrete Structures 4 SH

CS U211 Fundamentals of Computer Science 1 4 SH

CS U212 Fundamentals of Computer Science 2 4 SH

Computer Science Required Courses

Complete the following four courses:

CS U370 Object-Oriented Design 4 SH

CS U390 Theory of Computation 4 SH

CS U670 Software Development 4 SH

CS U690 Algorithms and Data 4 SH

Computer Science Senior Seminar

Complete one senior seminar:

CS U600 Senior Seminar 1 SH

or CS U610 Honors Senior Seminar 4 SH

Integrative Courses

Choose one of the following courses:

CS U540 Computer Graphics 4 SH

or CS G252 Cryptography and Communications Security 4 SH

Computer Science Elective Courses

Complete two upper-division courses from the CS department, CS U300 to CS U699.

With department approval, directed study courses, project courses, and appropriate graduate-level courses may also be taken as computer science electives.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in all CS and IS courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

133 total semester hours required

Minimum 2.000 GPA required

BS in Computer Science and Physics**BS CORE REQUIREMENTS***English Requirement*

Complete the following two courses with a grade of C or higher:

ENG U111	College Writing	4 SH
ENG U302	Advanced Writing in the Technical Professions	4 SH

Mathematics/Integrative

Complete the following five courses. A grade of C- or higher is required in MTH U241 and MTH U242.

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U345	Ordinary Differential Equations	4 SH
MTH U525	Applied Analysis	4 SH

Methods of Inquiry

Courses from your major cannot count toward the core.

Choose one course from one of the following contexts:

ARTS CONTEXT

Choose from the list "Approved Courses: Methods of Inquiry—Arts Context" on page 43.

HUMANITIES CONTEXT

A grade of C- or higher is required in the following course:

PHL U215	Symbolic Logic	4 SH
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NATURAL WORLD CONTEXT

Choose from the list "Approved Courses: Methods of Inquiry—Natural World Context" on page 43.

SOCIAL WORLD CONTEXT

Choose from the list "Approved Courses: Methods of Inquiry—Social World Context" on page 43.

Diversity

Complete one course from the list "Approved Courses: Diversity" on page 44.

Historical, Ethical, and Aesthetic Perspectives

Complete one course from the list "Approved Courses: Historical, Ethical, and Aesthetic Perspectives" on page 44.

Analysis

Complete the following course:

SOC U528	Computers and Society	4 SH
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PHYSICS COURSES*Required Courses*

Complete the following two courses with their associated labs:

PHY U161	Physics 1	5 SH
with PHY U162	Lab for PHY U161	0 SH
PHY U165	Physics 2	5 SH
with PHY U166	Lab for PHY U165	0 SH

Intermediate Physics

Complete the following three courses:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH

Advanced Physics

Complete the following two courses:

PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U602	Electricity and Magnetism	4 SH

Physics Elective

Choose one upper-division course from the PHY department, PHY U300 to PHY U699.

COMPUTER SCIENCE COURSES*Computer Science Overview*

Freshmen or freshmen transfers must complete the following two courses:

CS U221	Computer/Information Science Overview 1	1 SH
CS U222	Computer/Information Science Overview 2	1 SH

Upper-level transfer students must complete the following course:

CS U223	Computer/Information Science Co-op Preparation	1 SH
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and must also make up the 1 SH missed by not taking CS U221.

Computer Science Fundamental Courses

Complete the following three courses with a grade of C- or higher:

CS U200	Discrete Structures	4 SH
CS U211	Fundamentals of Computer Science 1	4 SH
CS U212	Fundamentals of Computer Science 2	4 SH

Computer Science Required Courses

Complete the following four courses:

CS U370	Object-Oriented Design	4 SH
CS U390	Theory of Computation	4 SH
CS U670	Software Development	4 SH
CS U690	Algorithms and Data	4 SH

Computer Science Senior Seminar

Complete one senior seminar:

CS U600	Senior Seminar	1 SH
or CS U610	Honors Senior Seminar	4 SH

Computer Science Elective Courses

Complete one upper-division course from the CS department, CS U300 to CS U699.

With department approval, directed study courses, project courses, and appropriate graduate-level courses may also be taken as computer science electives.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in all CS and IS courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

133 total semester hours required

Minimum 2.000 GPA required

Program Length

Normally, the undergraduate program is five years, with seven full academic semesters, two summer half semesters, and three semesters of cooperative education. Some students may complete the program in four years with a reduced cooperative education component. The college is strongly committed to the cooperative education program since it believes that the opportunity to integrate academic learning with practical experience in industry can greatly contribute to a student's personal and professional development.

College of Criminal Justice

JACK R. GREENE, PHD, *Dean*

Robert D. Croatti, AB, *Associate Dean for Special Programs and Director of Alumni Affairs*

John F. McDevitt, MPA, *Associate Dean and Director for the Center of Criminal Justice Policy Research*

Lester W. McCullough Jr., BA, *Associate Dean for Administrative Services*

Robert E. Fuller, MA, *Assistant Dean for Student Services*

Alison L. Moll, MEd, *Academic Counselor*

Sonya L. Wilder, MEd, *Senior Academic Counselor*

PROFESSORS

Donna M. Bishop, PhD

Simon I. Singer, PhD

LIPMAN FAMILY PROFESSOR

James Alan Fox, PhD

ELMER V. H. AND EILEEN M. BROOKS TRUSTEE PROFESSOR

Peter K. Manning, PhD

ASSOCIATE PROFESSOR

Wallace W. Sherwood, LL.M.

ASSISTANT PROFESSORS

Jeb A. Booth, PhD

Ni He, PhD

Cynthia Lum, PhD

Jennifer B. Robinson, PhD

Marc L. Swatt, PhD

William Terrill, PhD

Sean P. Varano, PhD

Geoff K. Ward, PhD

Richard P. Wiebe, JD, PhD

SCHULMAN PROFESSOR

Harvey Burstein, JD

VISITING PROFESSORS

Bridgette M. Baldwin, JD

Roderick L. Ireland, LL.M., PhD

PROFESSOR EMERITUS

Edith E. Flynn, PhD

The College of Criminal Justice was established in 1967 as one of the first professional schools of its kind. Since its founding, the college has become a leading force in education, research, and policy making in both the public and private sectors of the criminal justice field.

The College of Criminal Justice prepares students for professional and research careers in criminal justice, criminology, and related fields by applying multidisciplinary and comparative social science to understand, predict, and explain crime and contribute to the development of public policy within urban communities. Using an active learning approach, the college seeks to develop its students intellectually and ethically, while providing them with a keen appreciation of the complexities of crime, and the public and private efforts to make communities safer and ensure justice.

The world of criminal justice is much more than the police officer, corrections official, or security guard. At the College of Criminal Justice, the boundaries of criminal justice have expanded beyond traditional views of the field—police, courts, corrections. Instead, criminal justice education today is about more than the criminal; it involves understanding the victim and the community: repairing harm, reducing fear, rebuilding safe communities, and assuring justice in spirit and act.

The College of Criminal Justice has had a long-standing attachment and commitment to improving justice system agencies, including private security. The college actively engages external partners in an ongoing conversation about research, community service, and salient policy questions. Part of this dialogue is supported by an ongoing program of applied and social science research. Much of this research focuses on evaluating existing government crime-control programs and policies to determine whether they work, as well as inquiries about the etiology and prevention of crime. In addition, much of our research examines the unintended consequences of policy: institutionalized racism, exclusion of certain groups, and so forth. In every case, the research conducted at Northeastern is approached with ethical sensitivity and scientific rigor.

Criminal justice, as a social science, began in the early part of the twentieth century. Nearly one hundred years old, criminal justice has blossomed as a science, in great part through the ingenuity of several notable scholars. The College of Criminal Justice is pleased to be home to many of the country's preeminent contemporary scholars. The CCJ faculty regularly present at scholarly conferences and national and international seminars.

Class Entrance Requirements

Students are required to maintain the following overall grade-point averages to advance to the next class rank and to graduate.

Sophomore	1.800
Middler	1.800
Junior	1.800
Senior	1.900
To graduate	2.000

Graduation Requirements

Degree candidates must complete all prescribed work, a total of 132 semester hours of credit. Students are also urged to meet the requirements of the Department of Cooperative Education.

Transfer Credit

A student transferring from another college or university must be in residence at Northeastern at least 32 of the final 40 semester hours to receive a degree.

BS in Criminal Justice**ENGLISH REQUIREMENT**

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C or better is required in both courses.

DIVERSITY

Requirements satisfied by CJ U102.

CRIMINAL JUSTICE CORE REQUIREMENTS*General Education Courses*

Complete the following four courses:

CS U101	Computer Science and Its Applications	4 SH
MTH U115	Applications of Algebra	4 SH
PSY U101	Foundations of Psychology	4 SH
SOC U101	Introduction to Sociology	4 SH

Social Science Course

Choose one course from the following list:

ECN U101	Economic Problems and Perspectives	4 SH
HST U130	Introduction to American History	4 SH
POL U150	American Government	4 SH

Science and Mathematics Course

Choose one course from the following departments:

BIO, CHM, CS, GEO, MTH, or PHY.

Humanities Course

Choose one course from the following departments:

ASL, CMN, ENG, LIN, PHL, or SLA.

CRIMINAL JUSTICE—MAJOR*Introduction to College*

Complete the following course:

CJ U100	College: An Introduction	1 SH
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Required Courses

Complete the following six courses:

CJ U101	Introduction to Criminal Justice	4 SH
CJ U102	Ethics, Values, and Diversity	4 SH
CJ U110	Criminal Due Process	4 SH
CJ U120	Criminology	4 SH
CJ U380	Criminal Justice Research Methods	4 SH
CJ U382	Criminal Justice Statistics	4 SH

Integrated Learning Core

Complete the following three courses:

CJ U290	Co-op Integration Seminar 1	1 SH
CJ U390	Co-op Integration Seminar 2	1 SH
CJ U690	Co-op Integration Seminar 3	1 SH

Senior Capstone

Complete the following course:

CJ U799	Senior Capstone Seminar	4 SH
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CRIMINAL JUSTICE—ELECTIVES*Concentration Electives*

Choose two courses from the following list:

CJ U310	Criminal Law	4 SH
CJ U330	Corrections	4 SH
CJ U340	Security	4 SH
CJ U350	Policing	4 SH
CJ U360	Juvenile Justice	4 SH

System-Wide Electives

Choose one course from the following list:

CJ U500	Gender, Crime, and Justice	4 SH
CJ U502	Race, Crime, and Justice	4 SH
CJ U506	Criminal Justice Organization and Management	4 SH
CJ U508	Crime Prevention	4 SH

Advanced Electives

Choose four courses from the following list:

POLICING

CJ U520	Communities and Crime	4 SH
CJ U550	Police Strategy	4 SH
CJ U555	Forensic Science	4 SH
CJ U650	Seminar in Policing	4 SH

SECURITY

CJ U540	Security Management, Supervision	4 SH
CJ U576	Corporate and White-Collar Crime	4 SH
CJ U640	Seminar in Security	4 SH

LEGAL STUDIES

CJ U510	Juvenile Law	4 SH
CJ U512	Legal Philosophy	4 SH
CJ U515	Courts and Sentencing	4 SH
CJ U518	Law and Psychology	4 SH
CJ U610	Seminar in Law	4 SH

CRIMINOLOGY

CJ U518	Law and Psychology	4 SH
CJ U522	Comparative Criminal Justice	4 SH
CJ U525	Psychology of Crime	4 SH

CJ U570	Criminal Violence	4 SH
CJ U572	Youth Gangs	4 SH
CJ U574	Organized Crime	4 SH
CJ U575	Political Crime and Terrorism	4 SH
CJ U576	Corporate and White-Collar Crime	4 SH
CJ U578	Victims of Crime	4 SH
CJ U600	Seminar in Criminal Justice	4 SH
CJ U620	Seminar in Criminology	4 SH
CJ U680	Seminar in Research	4 SH

CORRECTIONS

CJ U515	Courts and Sentencing	4 SH
CJ U530	Community-Based Corrections	4 SH
CJ U535	Correctional Intervention	4 SH
CJ U578	Victims of Crime	4 SH
CJ U630	Seminar in Corrections	4 SH

JUVENILE

CJ U510	Juvenile Law	4 SH
CJ U520	Communities and Crime	4 SH
CJ U530	Community-Based Corrections	4 SH
CJ U535	Correctional Intervention	4 SH
CJ U570	Criminal Violence	4 SH
CJ U572	Youth Gangs	4 SH
CJ U660	Seminar in Juvenile Justice	4 SH

CRIMINAL JUSTICE SEQUENCE REQUIREMENT

Must complete four courses from the same department and five electives outside of criminal justice.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

132 total semester hours required

Minimum 2.000 GPA required

College of Engineering

ALLEN L. SOYSTER, PHD, *Dean*

Richard J. Scranton, SM, *Associate Dean for Undergraduate Programs*

Cynthia Snow, MA, *Associate Dean for Administration*

Yaman Yener, PhD, *Associate Dean for Research and Graduate Studies*

Walter Buchanan, PhD, *Director of the School of Engineering Technology and the Lowell Institute School*

Richard Harris, BS, *Director of Multicultural Engineering*

Rachelle Reisberg, MS, *Director of Women in Engineering*

David Navick, PhD, *Assistant Dean for Engineering Enrollment*

Lisa Koch, PhD, *Assistant Dean for Educational and Computer Technology*

Candace A. Martel, MEd, *Director of Engineering Student Services*

The mission of the College of Engineering is to provide a teaching, learning, and research environment that results in the highest-quality education for our students. Consistent with our goal of providing the highest-quality, practice-oriented program, the College of Engineering prepares students to contribute to the accumulation and application of technical knowledge. The college helps students master the fundamental mathematical and scientific principles underlying a particular branch of engineering; develop and demonstrate competence in analysis and design appropriate to an engineering specialization; reason clearly and communicate effectively; and recognize the need to continue professional development.

Through laboratory exercises, senior design projects, professional association activities, and cooperative work assignments, students put theory into practice and clarify their professional goals.

The college offers a Bachelor of Science degree with specializations in chemical, civil, computer, electrical, industrial, and mechanical engineering. The five-year Bachelor of Science degree program, which includes eighteen months of cooperative education work experience, is the standard and most popular program. Four-year programs with and without co-op experience are also available.

The college encourages students to study the arts, sciences, business, and other areas outside of engineering, for they provide an awareness of the social, economic, political, aesthetic, and philosophical influences that shape the world in which graduates will practice their professions. Students may complete a minor in areas such as business, computer science, biomedical engineering, math, or music. In many cases, the minor can be completed without course overloads.

In addition to a full array of University services, special advising and other support services (including tutoring) are provided. Students may qualify to participate in honors sections of many courses. Active student chapters of many national professional engineering organizations and honor societies are supported by the college as an enriching addition to academic studies and co-op experience.

The Bachelor of Science degree programs with specification in chemical, civil, electrical, industrial, and mechanical engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET).

College of Engineering Arts and Humanities Requirements

HISTORICAL PERSPECTIVE ELECTIVE

Complete any one HST course or any one course from the following list:

AFR U312	Black History of Boston	4 SH
AFR U350	History of Blacks in the Media and the Press	4 SH
ASL U350	Deaf History and Culture	4 SH
ECN U293	European Economic History	4 SH
ECN U470	American Economic History	4 SH
INT U305	Maritime History of New England	4 SH

SOCIAL/CULTURAL PERSPECTIVE ELECTIVE

Complete any one course from the following departments

AFR, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, or SOA or any one course from the following list:

ARC U223	American Architecture	4 SH
ART U305	Renaissance Art	4 SH
ART U310	Nineteenth-Century Art	4 SH
ART U319	Gender and the Visual Arts	4 SH
ART U320	American Art	4 SH
ASL U150	Deaf People in Society	4 SH
ECN U240	Economics of Crime	4 SH
ECN U270	Economic Status of Ethnic Minorities	4 SH
ENG U226	Backgrounds in English and American Literature	4 SH
ENG U409	The Modern Novel	4 SH
ENG U425	Literature and Law	4 SH
ENG U427	The Literature of Science	4 SH
ENG U454	History of English	4 SH
ENG U520	American Novels 2	4 SH
ENG U611	Shakespeare	4 SH
ENG U671	Multiethnic Literature of the U.S.	4 SH
ENG U687	Modern Poetry	4 SH
ENG U688	Contemporary Poetry	4 SH
GEO U112	Environmental Geology	4 SH
GEO U510	Environmental Planning	4 SH
HRM U201	Organizational Behavior	4 SH
HST U110	Introduction to World History	4 SH
HST U204	Third World Women	4 SH
HST U242	Women in America	4 SH
HST U261	The Modern Caribbean	4 SH
HST U270	Ancient Greece	4 SH
HST U272	The Invention of Europe	4 SH
HST U286	History of the Soviet Union	4 SH
HST U290	Modern Middle East	4 SH
HST U311	Colonialism/Imperialism	4 SH
HST U322	Work and Leisure	4 SH
HST U330	Colonial and Revolutionary America	4 SH
HST U337	African-American History before 1900	4 SH
HST U340	Cultural History of the U.S.	4 SH
HST U342	Environmental History of North America	4 SH
HST U344	U.S. Urban History	4 SH

HST U370	Renaissance to Enlightenment	4 SH
HST U376	The British Empire	4 SH
HST U391	Modern African Civilization	4 SH
HST U392	African Diaspora	4 SH
HST U394	Islamic Nationalism	4 SH
HST U432	Latin America in Boston	4 SH
HST U475	The Culture of Europe	4 SH
INT U240	War and Conflict in Nuclear Age	4 SH
INT U310	Water Resources Policy and Management	4 SH
JRN U150	Interpreting the Day's News	4 SH
MTH U201	History of Mathematics	4 SH
MUS U103	Music as a Social Expression	4 SH
MUS U121	Medieval and Renaissance Music	4 SH
PHL U135	Philosophical Problems of Law and Justice	4 SH
PHL U137	Philosophical Problems of War and Peace	4 SH
PHL U145	Technology and Human Values	4 SH
PHL U150	Understanding the Bible	4 SH
PHL U160	Philosophical Problems of Economic Justice	4 SH
PHL U165	Moral Problems in Medicine	4 SH
PHL U180	Ecology Ethics	4 SH
PHL U265	Latin American Religions	4 SH
PHL U275	Eastern Religions	4 SH
PHL U280	Islam	4 SH
PHL U325	Ancient Philosophy	4 SH
PHL U330	Modern Philosophy	4 SH
POL U165	Public Policy and Administration	4 SH
POL U375	Gender and Politics	4 SH
POL U380	Latino Politics in the United States	4 SH
POL U390	Science, Technology, and Public Policy	4 SH
POL U415	Ethnic Conflict in Comparative Politics	4 SH
POL U420	War and Political Violence	4 SH
POL U425	U.S. Foreign Policy	4 SH
POL U435	Politics in Western Europe	4 SH
POL U440	Politics in Northern Ireland	4 SH
POL U445	Politics in Central and Eastern Europe	4 SH
POL U450	Government and Politics in Russia	4 SH
POL U460	Government and Politics in Africa	4 SH
POL U465	Government and Politics in the Middle East	4 SH
POL U470	Arab-Israeli Conflict	4 SH
POL U475	Government and Politics in Latin America	4 SH
POL U480	Government and Politics in Japan	4 SH
POL U485	Government and Politics in China	4 SH
POL U487	Politics of Developing Nations	4 SH
SOC U246	Environment and Sociology	4 SH
SOC U280	Sociology of Work	4 SH
SOC U402	Feminist Perspectives on Society	4 SH
SOC U415	Society and Culture in Russia	4 SH
SOC U440	Sociology of Human Service Organization	4 SH
SOC U485	Environment, Technology, and Society	4 SH
SOC U528	Computers and Society	4 SH
THE U210	Theatre and Society	4 SH

Bachelor of Science/Master of Science Joint-Degree Program

The departments of electrical and computer engineering and mechanical, industrial, and manufacturing engineering offer programs leading to both the bachelor's and master's degrees in five years. Degree candidates must maintain a 3.200 cumulative grade-point average, carry extra courses, and reduce the number of cooperative education semesters to complete the course requirements.

Class Entrance Requirements

Academic standards are published in the *College of Engineering Student Guide*, available at 220 Snell Engineering Center.

Graduation Requirements

The college reserves the right to amend programs, courses, and degree requirements to fulfill its educational responsibility to respond to relevant changes in the field.

Students must complete all of the requirements in the degree program in which they are candidates. Degree requirements are based upon the year of graduation, determined by the date of entry or reentry into the College of Engineering. Degree requirements and the year of graduation for a degree candidate who fails to make normal academic progress will be subject to review and possible change.

Students transferring from another college or university must complete 32 of the last 40 semester hours at Northeastern University immediately preceding graduation to be eligible to receive the Bachelor of Science degree.

CHEMICAL ENGINEERING

ERIC J. THORGERSON, PhD

Department Officer and Visiting Professor

PROFESSORS

Albert Sacco Jr., PhD, *George A. Snell Professor of Engineering*

Ronald J. Willey, PhD

ASSOCIATE PROFESSORS

Nurcan Bac, PhD

Gilda A. Barabino, PhD

ASSISTANT PROFESSORS

Carolyn W. T. Lee-Parsons, PhD

Katherine S. Ziemer, PhD

VISITING PROFESSOR

John Paul San Giovanni, PhD

ASSOCIATE PROFESSORS EMERITI

Ralph A. Buonopane, PhD

Bernard M. Goodwin, ScD

Richard R. Stewart, PhD

ADJUNCT PROFESSORS

Edgar B. Gutoff, ScD

Behrooz (Barry) Satvat, PhD

The chemical engineering program offers students a broad education that stresses the fundamentals of science, technology, and engineering, and incorporates state-of-the-art computer-aided design and management of chemical production processes. An undergraduate degree in chemical engineering provides a solid background for practice or graduate study in the diverse areas of chemical engineering found in industry. Chemical engineers create new products such as the wonder drugs that improve our well-being, materials that enhance our life on Earth, and systems that make space exploration possible. Petrochemicals, biomedicines, pharmaceuticals, agricultural chemicals, plastics, fibers, and synthetic fuels are among the materials of the modern world that are the results of chemical engineering. Chemical engineers explore ways to reduce acid rain and smog, to recycle and reduce wastes, to develop new sources of environmentally clean energy, and to use existing resources safely and efficiently. Chemical engineers develop new products while seeking ways to reduce costs, increase production, and improve the quality and safety of new products.

The faculty of the chemical engineering program are committed to providing a practice-oriented education by providing an academic environment that encourages active learning and draws connections between co-op experiences and classroom theory. A professional component prepares students to apply rigorous chemical engineering principles to a variety of contemporary problems and includes thorough groundwork in mathematics, physical sciences, and engineering science as well as real-world design and laboratory experiences. A liberal arts component is included to provide students with the general education skills necessary to identify the impact of engineering decisions in a broad societal context. The cooperative education component provides an integrated educational experience that enables students to gain practical workplace knowledge that is supported by an academic curriculum designed to integrate theoretical concepts and practical applications. This combination of academic and cooperative education opportunities enables students to gain more knowledge, with increasing challenges and responsibilities, while progressing toward fully professional careers in chemical engineering.

The chemical engineering program integrates faculty expertise and scholarship, a rigorous set of academic courses, and real-world cooperative education experiences to provide an education for students that will enable them to identify and solve chemical engineering problems; understand, analyze, and design chemical processes; be proficient in the use of modern engineering tools; be proficient in oral and written communication of their work and ideas; become independent learners and workers; participate effectively in intradisciplinary and interdisciplinary groups; design and perform laboratory experiments to acquire data and evaluate theories; understand the environmental and safety impact of their work as chemical

engineers; understand the global and societal impact of engineering problems and solutions; conduct themselves in accordance with the highest ethical and professional standards; be prepared for lifelong learning and continuing education. The chemical engineering curriculum shown below is designed to meet those objectives and is periodically evaluated and revised to ensure that graduates of the program achieve these objectives. See pages 226–228 for course descriptions.

BSCHE—Bachelor of Science in Chemical Engineering

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C is required in both courses.

CHEMICAL ENGINEERING GENERAL EDUCATION

Mathematics and Science

PHYSICS

Complete the following two courses with corresponding labs:

PHY U151 Physics for Engineering 1 5 SH

PHY U155 Physics for Engineering 2 5 SH

CHEMISTRY

Complete the following five courses with corresponding labs:

CHM U151 General Chemistry for Engineers 4 SH

CHM U311 Organic Chemistry 1 5 SH

CHM U313 Organic Chemistry 2 5 SH

CHM U401 Physical Chemistry 1 5 SH

CHM U403 Physical Chemistry 2 5 SH

MATHEMATICS

Complete the following four courses:

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U242 Calculus 2 for Science and Engineering 4 SH

MTH U341 Calculus 3 for Science and Engineering 4 SH

MTH U343 Differential Equations and Linear Algebra for Engineering 4 SH

Arts and Humanities

Complete two courses from “College of Engineering Arts and Humanities Requirements” on page 163.

CHEMICAL ENGINEERING MAJOR REQUIREMENTS

First-Year Engineering

Complete the following two courses:

GE U110 Engineering Design 4 SH

GE U111 Engineering Problem Solving and Computation 4 SH

General Engineering

Complete the following three courses:

GE U100 Introduction to the Study of Engineering 1 SH

CHE U300 Introduction to Engineering Co-op Education 1 SH

or GE U300 Introduction to Engineering Co-op Education 1 SH

CHE U500 Professional Issues in Engineering 1 SH

or GE U500 Professional Issues in Engineering 1 SH

Chemical Engineering Fundamentals

Complete the following course:

CHE U306 Chemical Engineering Calculations 4 SH

Transport Processes and Operations

Complete the following two courses:

CHE U310 Transport Processes and Operations 1 4 SH

CHE U312 Transport Processes and Operations 2 4 SH

Thermodynamics

Complete the following two courses:

CHE U320 Chemical Engineering Thermodynamics 1 4 SH

CHE U322 Chemical Engineering Thermodynamics 2 4 SH

Process

Complete the following three courses:

CHE U510 Chemical Engineering Kinetics 4 SH

CHE U512 Chemical Engineering Process Control 4 SH

CHE U520 Unit Operations and Separation Processes 5 SH

Chemical Process Design

Complete the following two courses with corresponding labs:

CHE U701 Chemical Process Design 1 5 SH

CHE U703 Chemical Process Design 2 5 SH

Chemical Engineering Technical Electives

Choose one course from the following list:

CHE U620 Pollution Control in Chemical Industries 4 SH

CHE U624 Chemical Process Safety 4 SH

CHE U630 Biochemical Engineering Fundamentals 4 SH

CHE U721 Projects 1 4 SH

CHE U722 Projects 2 4 SH

CHE U970 Junior/Senior Project 1 4 SH

CHE U971 Junior/Senior Project 2 4 SH

CHEMICAL ENGINEERING GENERAL ELECTIVE REQUIREMENTS

Complete four 4-SH-equivalent, nonremedial, nonrepetitive courses chosen from the following departments: ACC, AFR, ARC, ART, ASL, BIO, CHE, CHM, CIN, CIV, CJ, CMN, CS, ECE, ECN, ED, ENG, ENT, ENV, FIN, GEO, HRM, HS, HST, IAF, INB, INT, IS, JRN, LIN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MGT, MIM, MKT, MMS, MSC, MTH, MUS, PHL, PHY, POL, PSY, SCM, SOA, SOC, or THE.

GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

140 total semester hours required

Minimum 2.000 GPA required

CIVIL AND ENVIRONMENTAL ENGINEERING

PETER G. FURTH, PhD

Professor and Chair

PROFESSORS

Vladimir Novotny, PhD, *Camp, Dresser & McKee, Inc.**Professor of Engineering*

Mishac K. Yegian, PhD

ASSOCIATE PROFESSORS

Akram N. Alshawabkeh, PhD

Dionisio Bernal, PhD

Haris N. Koutsopoulos, PhD

David E. Langseth, ScD

Richard J. Scranton, SM

Thomas C. Sheahan, ScD

Ali Touran, PhD

Sara Wadia-Fascetti, PhD

Irvine W. Wei, PhD

ASSISTANT PROFESSORS

Mehrdad Sasani, PhD

James Y. Wang, PhD

PROFESSORS EMERITI

Paul H. King, PhD

Kenneth M. Leet, ScD

Civil engineers judiciously apply their knowledge of mathematics and physical sciences to improve and protect the environment and to provide facilities and structures for community living, industry, and transportation. Civil engineering encompasses several disciplines, including structural engineering, environmental engineering, transportation planning and engineering, and geotechnical engineering. They supervise the construction of bridges, tunnels, buildings, dams, and aqueducts. Civil engineers also plan, design, construct, and manage highways, railroads, canals, and airports; regulate rivers and control floods; design and build systems for water distribution, wastewater treatment, refuse disposal, and environmental remediation.

The civil engineering program has four educational objectives. The first is that our students gain an understanding of the natural and cultural world. Mathematics, physics, and chemistry are the foundation of civil engineering. Such a foundation enables students to properly understand and apply engineering principles, and makes the Northeastern education one that can keep pace with the advances in this dynamic field. Likewise, it is important for students to understand the historical and cultural context in which engineering takes place and to understand the social and environmental impact of engineering projects.

The second objective is that our students become technically prepared for engineering practice. Students acquire a common base of knowledge in the engineering sciences,

including mechanics and environmental science. In more advanced courses, students learn to analyze and design building frames and bridges, water and wastewater treatment systems, highways and traffic systems, hydraulic systems, earth dams, building foundations, and construction management systems. Our program is designed to give students proficiency in at least four areas of civil engineering. Students may also earn an optional concentration in structural engineering or environmental engineering.

The third program objective is that our students develop skills in critical thinking, communication, information literacy, and aesthetics. These subjects are integrated into courses throughout the program. Particular emphasis is placed on the importance of effective writing and public speaking.

The fourth program objective is that our students develop a personal and professional ethic—that is, an understanding of the profession, its ethical codes, history, contemporary issues, and the need for lifelong learning. Course work, cooperative education, and participation in the activities of the college's award-winning student chapter of the American Society of Civil Engineers help students meet this goal.

The civil engineering program provides students with a broad education appropriate for a variety of career choices and lifelong learning. Experience tells us that civil engineering graduates will enter almost every field imaginable. The knowledge and skills acquired—understanding science, critical thinking, effective communication, and understanding the social context, among them—form an excellent foundation for a host of careers, as well as for a fulfilling life outside the world of work. The civil engineering program has been designed with four general electives that permit students to explore or acquire further depth in other fields of interest. Students can use these electives to earn a minor in business, architectural history, music, computer science, or any number of other fields.

The co-op program parallels the academic program in level of responsibility and sophistication. A beginning job might involve layout at a construction site or laboratory testing; in senior-level co-op assignments, students are often working alongside engineers on design teams. See pages 235–238 for course descriptions.

BSCE—Bachelor of Science in Civil Engineering

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

CIVIL ENGINEERING GENERAL EDUCATION

Mathematics and Science

PHYSICS

Complete the following two courses with corresponding labs:

PHY U151 Physics for Engineering 1 5 SH

PHY U155 Physics for Engineering 2 5 SH

CHEMISTRY

Complete the following course:

CHM U151 General Chemistry for Engineers 4 SH

MATHEMATICS

Complete the following four courses:

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U242 Calculus 2 for Science and Engineering 4 SH

MTH U341 Calculus 3 for Science and Engineering 4 SH

MTH U343 Differential Equations and Linear Algebra
for Engineering 4 SH**ECONOMICS**

Choose one course from the following list:

ECN U115 Principles of Macroeconomics 4 SH

or ECN U116 Principles of Microeconomics 4 SH

MATH AND SCIENCE ELECTIVESChoose one course from the following list with corresponding
labs as applicable:

BIO U121 Basic Microbiology 4 SH

BIO U151 Introduction to Marine Biology 4 SH

CHM U311 Organic Chemistry 1 5 SH

CHM U321 Analytical Chemistry 5 SH

CHM U401 Physical Chemistry 1 5 SH

CHM U403 Physical Chemistry 2 5 SH

ECE U210 Electrical Engineering 4 SH

ECE U322 Digital Logic Design 4 SH

GEO U400 Field Geology 4 SH

GEO U410 Geochemistry 4 SH

GEO U418 Geophysics 4 SH

GEO U582 Groundwater Geochemistry 4 SH

MIM U380 Thermodynamics 4 SH

MIM U455 Dynamics and Vibrations 4 SH

MIM U515 Operations Research 4 SH

MTH U481 Probability and Statistics 4 SH

MTH U581 Statistics and Stochastic Processes 4 SH

Arts and HumanitiesComplete two courses from "College of Engineering Arts and
Humanities Requirements" on page 163.**CIVIL ENGINEERING MAJOR REQUIREMENTS****First-Year Engineering**

Complete the following two courses:

GE U110 Engineering Design 4 SH

GE U111 Engineering Problem Solving
and Computation 4 SH**General Engineering**

Complete the following three courses:

GE U100 Introduction to the Study of Engineering 1 SH

CIV U300 Introduction to Engineering
Co-op Education 1 SHor GE U300 Introduction to Engineering
Co-op Education 1 SH

CIV U500 Professional Issues in Engineering 1 SH

or GE U500 Professional Issues in Engineering 1 SH

Materials

Complete the following three courses:

CIV U221 Statics and Strength of Materials 4 SH

CIV U260 Civil Engineering Materials 3 SH

CIV U261 Materials Lab 2 SH

Structural Analysis and Design

Complete the following two courses:

CIV U320 Structural Analysis 1 4 SH

CIV U324 Reinforced Concrete Design 4 SH

Fluid Mechanics

Complete the following course:

CIV U331 Fluid Mechanics and Hydraulic
Engineering 4 SH**Environmental Engineering and Soil Mechanics**

Complete the following three courses and corresponding lab:

CIV U331 Fluid Mechanics and Hydraulic
Engineering 4 SH

CIV U334 Environmental Engineering 1 4 SH

CIV U340 Soil Mechanics 4 SH

CIV U341 Lab for CIV U340 1 SH

Probability and Engineering Economy

Complete the following course:

CIV U464 Probability and Engineering Economy
for Civil Engineering 4 SH**Civil Engineering Technical Electives**

Choose three courses from the following list:

CIV U425 Steel Design 4 SH

CIV U534 Environmental Engineering 2 4 SH

CIV U536 Hydrologic Engineering 4 SH

CIV U553 Transport Analysis and Planning 4 SH

CIV U554 Highway Engineering 4 SH

CIV U556 Traffic Engineering 4 SH

CIV U575 Construction Management 3 SH

CIV U522 Structural Analysis 2 4 SH

with CIV U542 Foundation Engineering 4 SH

Capstone

Complete the following course:

CIV U769 Senior Design Project 5 SH

**CIVIL ENGINEERING GENERAL ELECTIVE
REQUIREMENTS**Complete four 4-SH-equivalent, nonremedial, nonrepetitive
courses chosen from the following departments: ACC, AFR,
ARC, ART, ASL, BIO, CHE, CHM, CIN, CIV, CJ, CMN, CS,
ECE, ECN, ED, ENG, ENT, ENV, FIN, GEO, HRM, HS, HST,
IAF, INB, INT, IS, JRN, LIN, LNA, LNC, LNF, LNG, LNI, LNJ,
LNL, LNM, LNR, LNS, MGT, MIM, MKT, MMS, MSC, MTH,
MUS, PHL, PHY, POL, PSY, SCM, SOA, SOC, or THE.**GPA REQUIREMENT**

Minimum 2.000 GPA required in the major.

GENERAL ELECTIVESAdditional courses taken beyond college and major course
requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

137 total semester hours required

Minimum 2.000 GPA required

ELECTRICAL AND COMPUTER ENGINEERING

FABRIZIO LOMBARDI, PhD

ITC Professor and Chair

PROFESSORS

Soeren Buus, PhD

Chung Chan, PhD

Anthony J. Devaney, PhD

Arvin Grabel, ScD

Nicol E. McGruer, PhD

Stephen W. McKnight, PhD

Sarma S. Mulukutla, PhD

Sheila Prasad-Hinchey, PhD

Carey M. Rappaport, ScD

Martin E. Schetzen, ScD

Philip E. Serafim, ScD

Michael B. Silevitch, PhD

Aleksandar M. Stankovic, PhD

Carmine Vittoria, PhD

ASSOCIATE PROFESSORS

David Brady, PhD

Dana H. Brooks, PhD

Charles DiMarzio, PhD

Jeffrey A. Hopwood, PhD

Vinay Ingle, PhD

David R. Kaeli, PhD

Mieczyslaw M. Kokar, PhD

Miriam E. Leaser, PhD

Bradley M. Lehman, PhD

Hanoch Lev-Ari, PhD

Elias S. Manolakos, PhD

Waleed Meleis, PhD

Eric Miller, PhD

Masoud Salehi, PhD

Bahram Shafai, ScD

Gilead Tadmor, PhD

ASSISTANT PROFESSORS

Stefano Basagni, PhD

Jennifer Dy, PhD

Yong-Bin Kim, PhD

A. Bruce McDonald, PhD

Fred John Meyer, PhD

LECTURER

Jacob Shekel, ScD

ADJUNCT AND RESEARCH FACULTY

Dimitar Avresky, PhD

Amir Farhat, PhD

Zainalabedin Navabi, PhD

PROFESSOR EMERITUS

John G. Proakis, PhD

The Department of Electrical and Computer Engineering offers two distinct Bachelor of Science programs: Bachelor of Science in electrical engineering (BSEE) and Bachelor of Science in computer engineering (BSCompE). An integrated dual major is available in electrical and computer engineering for students who complete the requirements of both majors. In addition, a minor in electrical engineering, a minor in computer engineering, and a minor in biomedical engineering are available to qualified students throughout the University, including majors within the department.

Successful engineers need to organize and adapt information to solve problems. They also must work effectively in teams and communicate well. The electrical engineering and computer engineering programs develop these skills and provide the appropriate technical background for a successful career. The objectives of the Bachelor of Science programs are that every student will develop and apply in an engineering context, (1) mathematical, scientific, computational, and experiential knowledge and skills; (2) the technical skills necessary for engineering practice; (3) the communications and interpersonal skills necessary as engineering professionals; (4) a personal and professional ethic appropriate to the practice of engineering; and (5) an awareness of the social, cultural, and historical context of engineering solutions.

The curricula are continuously assessed to ensure that graduates can achieve these goals and go on to succeed as professional electrical or computer engineers. The bachelor of science programs allow students sufficient flexibility within the standard eight academic semesters to earn a minor in nearly any department in the University. Typical minors might include electrical engineering, computer engineering, physics, math, computer science, or business, but students might also organize their course of study to earn a minor in economics, English, or music.

The academic program is supported by extensive laboratory facilities for study and experimentation in computing, circuits analysis, electronics, digital systems, microwaves, control systems, semiconductor processing, VLSI design, and digital signal processing. Students have access to state-of-the-art computing facilities, including numerous UNIX-based Sun and Compaq workstations, and Windows-based personal computers, all connected to the Internet. Many courses are taught in one of the four computer-based teaching classrooms, where students work online and practice the theory presented in lecture while still in the classroom.

More than 90 percent of department undergraduates take advantage of the cooperative education program. During the cooperative work phase of the program, the students' levels

of responsibility grow as they gain theoretical and technical knowledge through academic work. A sophomore might begin cooperative work experience as an engineering assistant and progress by the senior year to a position with responsibilities similar to those of entry-level engineers.

A senior-year design course caps the education by drawing on everything learned previously. Teams of students propose, design, and build a functioning electrical or computer engineering system—just as they might in actual practice.

Electrical Engineering

The components of the Information Age—global communication systems, computers and computer chips, and the software that runs them, as well as pacemakers, magnetic resonance imaging, and interplanetary space missions—are possible because of the efforts of electrical engineers. Today, electrical engineers are developing concepts and working to translate these ideas into the next generation of products, from computers and safe, energy-efficient vehicles, to radar that can detect unexploded land mines from the air, to microrobots that diagnose disease from inside the body.

Many electrical engineers work in the traditional areas of communications, computation, and control, and components required to realize such systems. They are involved in design and product development, testing and quality control, sales and marketing, and manufacturing. Others use their problem-solving skills in diverse areas such as bioengineering, health care, electronic music, meteorology, and experimental psychology. Some graduates draw on their electrical engineering backgrounds to launch successful careers as physicians, financial analysts, attorneys, and entrepreneurs.

As specified below, the BSEE degree requires a sequence of core courses and advanced study in one or more technical elective areas: electronic circuits and devices; signals and systems; fields, waves, and optics; power engineering; or computer engineering. Electives in historical perspective, social/cultural perspective, and social science/humanities are also required. See pages 250–257 for course descriptions.

BSEE—Bachelor of Science in Electrical Engineering

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

ELECTRICAL ENGINEERING GENERAL EDUCATION

Mathematics and Science

PHYSICS 1 AND 2

Complete the following two courses with corresponding labs:

PHY U151 Physics for Engineering 1 5 SH

PHY U155 Physics for Engineering 2 5 SH

CHEMISTRY

Complete the following course:

CHM U151 General Chemistry for Engineers 4 SH

CALCULUS 1 AND 2 FOR SCIENCE/ENGINEERING

Complete the following two courses:

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U242 Calculus 2 for Science and Engineering 4 SH

DIFFERENTIAL EQUATIONS/LINEAR ALGEBRA

Complete the following course:

MTH U343 Differential Equations and Linear Algebra for Engineering 4 SH

CALCULUS 3 FOR SCIENCE/ENGINEERING

Complete the following course:

MTH U341 Calculus 3 for Science and Engineering 4 SH

ALGORITHMS AND DATA STRUCTURES

Complete the following course:

CS U215 Algorithms and Data Structures for Engineering 4 SH

Arts and Humanities

Complete two courses from “College of Engineering Arts and Humanities Requirements” on page 163.

Humanities/Social Science Elective

Complete one course from the following departments: ARC, ART, CJ, ECN, ENG, MUS, PHL, POL, PSY, SOC, or THE.

ELECTRICAL ENGINEERING MAJOR REQUIREMENTS

First-Year Engineering

Complete the following two courses:

GE U110 Engineering Design 4 SH

GE U111 Engineering Problem Solving and Computation 4 SH

General Engineering

Complete the following three courses:

GE U100 Introduction to the Study of Engineering 1 SH

ECE U300 Introduction to Engineering 1 SH

Co-op Education

ECE U500 Professional Issues in Engineering 1 SH

Electrical Engineering Lab

Complete the following course:

ECE U401 Introduction to Electronic Engineering Lab 1 SH

Linear Circuits

Complete the following course:

ECE U400 Linear Circuits 4 SH

Electronics

Complete the following course with corresponding lab:

ECE U402 Electronics 4 SH

with ECE U403 Lab for ECE U402 1 SH

Digital Logic Design

Complete the following course with corresponding lab:

ECE U322 Digital Logic Design 4 SH

with ECE U323 Lab for ECE U322 1 SH

Linear Systems

Complete the following course with corresponding lab:

ECE U464 Linear Systems 4 SH
with ECE U465 Lab for ECE U464 1 SH

Electromagnetic Fields and Waves

Complete the following course with corresponding lab:

ECE U440 Electromagnetic Fields and Waves 4 SH
with ECE U441 Lab for ECE U440 1 SH

Noise and Stochastic Processes

Complete the following course:

ECE U468 Noise and Stochastic Processes 4 SH

Communication Systems

Complete the following course:

ECE U572 Communications Systems 1 4 SH

Electrical Engineering Technical Electives

Complete four 4-SH-equivalent courses from the following list:

ECE U300 to ECE U699

Capstone Design

Complete the following two courses:

ECE U790 Electrical Engineering Capstone 1 4 SH
ECE U792 Electrical Engineering Capstone 2 4 SH

ELECTRICAL ENGINEERING GENERAL ELECTIVE REQUIREMENTS

Complete four 4-SH-equivalent, nonremedial, nonrepetitive courses chosen from the following departments: ACC, AFR, ARC, ART, ASL, BIO, CHE, CHM, CIN, CIV, CJ, CMN, CS, ECE, ECN, ED, ENG, ENT, ENV, FIN, GEO, HRM, HS, HST, IAF, INB, INT, IS, JRN, LIN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MGT, MIM, MKT, MMS, MSC, MTH, MUS, PHL, PHY, POL, PSY, SCM, SOA, SOC, or THE.

GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

138 total semester hours required

Minimum 2.000 GPA required

Minor in Electrical Engineering

A minor in electrical engineering is open to all students in the University with the prerequisite calculus and physics background. The minor is particularly designed for majors in math, science, computer engineering, or other engineering departments, students who would like a coherent background in the theory and laboratory practice of electrical engineering. The completion of a minor in electrical engineering will be recognized by a notation on the student's transcript.

Minor in Electrical Engineering

REQUIRED COURSE

Complete one of the following courses with corresponding lab:

ECE U210 Electrical Engineering 4 SH
with ECE U211 Lab for ECE U210 1 SH
ECE U400 Linear Circuits 4 SH
with ECE U401 Introduction to Electronic Engineering Lab 1 SH

ELECTIVE COURSES

Complete two of the following courses with corresponding labs:

ECE U322 Digital Logic Design 4 SH
with ECE U323 Lab for ECE U322 1 SH
ECE U402 Electronics 4 SH
with ECE U403 Lab for ECE U402 1 SH
ECE U440 Electromagnetic Fields and Waves 4 SH
with ECE U441 Lab for ECE U440 1 SH

TECHNICAL ELECTIVES

Complete 5 semester hours of ECE electives.

GPA REQUIREMENTS

2.000 GPA required in the minor

Computer Engineering

The use of computer technology is exploding, driven by applications in wireless communications, multimedia, portable devices, and Internet computing. At the core of these technological advances are computer engineers who research, design, and develop hardware and software. With a degree in computer engineering you might develop an e-business Web site, design the next-generation microprocessor, write an embedded real-time operating system, or start your own software company.

The computer engineering major acquires a strong foundation in engineering principles and the physical sciences in addition to a powerful mix of theory and practice in hardware and software design. The core of the computer engineering curriculum comprises courses in computer organization and architecture, operating systems, computer-aided design, programming languages, optimization theory, and software design.

As specified below, the BSCompE degree requires a sequence of core courses, technical electives, general (free) electives, and electives in historical perspective, social/cultural perspective, and social science/humanities. See pages 162–169 for course descriptions.

BSCompE—Bachelor of Science in Computer Engineering

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C is required in both courses.

COMPUTER ENGINEERING GENERAL EDUCATION

Mathematics and Science

PHYSICS 1 AND 2

Complete the following two courses with corresponding labs:

PHY U151 Physics for Engineering 1 5 SH

PHY U155 Physics for Engineering 2 5 SH

CHEMISTRY

Complete the following course:

CHM U151 General Chemistry for Engineers 4 SH

CALCULUS 1 AND 2 FOR SCIENCE/ENGINEERING

Complete the following two courses:

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U242 Calculus 2 for Science and Engineering 4 SH

DIFFERENTIAL EQUATIONS/LINEAR ALGEBRA

Complete the following course:

MTH U343 Differential Equations and Linear Algebra for Engineering 4 SH

DISCRETE MATHEMATICS

Complete the following course:

MTH U230 Discrete Mathematics 4 SH

PROBABILITY AND STATISTICS

Complete the following course:

MTH U481 Probability and Statistics 4 SH

ALGORITHMS AND DATA STRUCTURES

Complete the following course:

CS U215 Algorithms and Data Structures for Engineering 4 SH

Arts and Humanities

Complete two courses from "College of Engineering Arts and Humanities Requirements" on page 163.

Humanities/Social Science Elective

Complete one course from the following departments: ARC, ART, CJ, ECN, ENG, MUS, PHL, POL, PSY, SOC, or THE.

COMPUTER ENGINEERING MAJOR REQUIREMENTS

First-Year Engineering

Complete the following two courses:

GE U110 Engineering Design 4 SH

GE U111 Engineering Problem Solving and Computation 4 SH

General Engineering

Complete the following three courses:

GE U100 Introduction to the Study of Engineering 1 SH

ECE U300 Introduction to Engineering Co-op Education 1 SH

ECE U500 Professional Issues in Engineering 1 SH

Electrical Engineering Lab

Complete the following course:

ECE U401 Introduction to Electronic Engineering Lab 1 SH

Linear Circuits

Complete the following course:

ECE U400 Linear Circuits 4 SH

Electronics

Complete the following course with corresponding lab:

ECE U402 Electronics 4 SH

with ECE U403 Lab for ECE U402 1 SH

Digital Logic Design

Complete the following course with corresponding lab:

ECE U322 Digital Logic Design 4 SH

with ECE U323 Lab for ECE U322 1 SH

Computer Architecture/Organization

Complete the following course:

ECE U324 Computer Architecture and Organization 4 SH

Optimization Methods

Complete the following course:

ECE U326 Optimization Methods 4 SH

Computer Networks

Complete the following two courses with corresponding labs:

ECE U628 Computer and Telecommunication Networks 4 SH

ECE U629 Internetworking Design Lab 1 SH

Computer Engineering Technical Electives

Complete four 4-SH-equivalent courses from the following list.

Only one course may be from computer science.

ECE U300 to ECE U699

CS U370 Object-Oriented Design 4 SH

CS U390 Theory of Computation 4 SH

CS U430 Database Design 4 SH

CS U480 Systems and Networks 4 SH

CS U520 Artificial Intelligence 4 SH

CS U540 Computer Graphics 4 SH

CS U660 Programming Languages 4 SH

CS U665 Compilers 4 SH

CS U680 Topics in Operating Systems 4 SH

Capstone Design

Complete the following two courses:

ECE U730 Computer Engineering Capstone 1 4 SH

ECE U732 Computer Engineering Capstone 2 4 SH

COMPUTER ENGINEERING GENERAL ELECTIVE REQUIREMENTS

Complete four 4-SH-equivalent, nonremedial, nonrepetitive courses chosen from the following departments: ACC, AFR, ARC, ART, ASL, BIO, CHE, CHM, CIN, CIV, CJ, CMN, CS, ECE, ECN, ED, ENG, ENT, ENV, FIN, GEO, HRM, HS, HST, IAF, INB, INT, IS, JRN, LIN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MGT, MIM, MKT, MMS, MSC, MTH, MUS, PHL, PHY, POL, PSY, SCM, SOA, SOC, or THE.

GPA REQUIREMENT

Minimum 2.000 GPA required in the major

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

137 total semester hours required

Minimum 2.000 GPA required

Minor in Computer Engineering

The minor in computer engineering is open to all students in the University. The minor is designed for students who would like a coherent background in the theory and laboratory practice of computer engineering. The completion of a minor in computer engineering will be recognized by a notation on the student's transcript.

Minor in Computer Engineering

REQUIRED COURSES

Complete the following three courses with one corresponding lab:

CS U215	Algorithms and Data Structures for Engineering	4 SH
ECE U322	Digital Logic Design	4 SH
with ECE U323	Lab for ECE U322	1 SH
ECE U324	Computer Architecture and Organization	4 SH

ELECTIVES

Complete 4 semester hours of technical electives.

GPA REQUIREMENTS

2.000 GPA required in the minor

Minor in Biomedical Engineering

Medical imaging and biomedical electronics are important areas of biomedical engineering that are within the province of electrical engineering. The minor in biomedical engineering is open to all students in the University with the prerequisite calculus and physics background. The minor is particularly designed for majors in electrical or computer engineering, biology, health science fields, or other engineering departments who would like a background in relevant aspects of biology and electrical engineering, with the opportunity to complete an interdisciplinary biomedical engineering (capstone) design project. Course work in anatomy and physiology and other health science topics is combined with technical engineering courses related to biomedical imaging and instrumentation. Specific curriculum information about the biomedical engineering minor may be obtained from the Department of Electrical and Computer Engineering office, 411 DA, from the department Web site, or by calling 617.373.2165.

Minor in Biomedical Engineering

REQUIRED ECE COURSES

Complete the following three courses:

ECE U401	Introduction to Electronic Engineering Lab	1 SH
ECE U790	Electrical Engineering Capstone 1	4 SH
ECE U792	Electrical Engineering Capstone 2	4 SH

BIOMEDICAL ECE COURSE

Choose one course from the following list:

ECE U512	Biomedical Electronics	4 SH
ECE U664	Biomedical Signal Processing	4 SH

TECHNICAL ELECTIVE

Choose one technical elective from the following list:

ECE U520	Software Engineering 1	4 SH
ECE U522	Software Engineering 2	4 SH
ECE U524	VLSI Design	4 SH
with ECE U525	Lab for ECE U524	1 SH
ECE U526	High-Speed Digital Design	4 SH
ECE U528	CAD for Design and Test	4 SH
ECE U530	Hardware Description Languages and Synthesis	4 SH
ECE U534	Microprocessor-Based Design	4 SH
with ECE U535	Lab for ECE U534	1 SH
ECE U574	Wireless Communication Circuits	4 SH
ECE U576	Wireless Personal Communications Systems	4 SH
ECE U580	Classical Control Systems	4 SH
with ECE U581	Lab for ECE U580	1 SH
ECE U600	Electronic Design	4 SH
with ECE U601	Lab for ECE U600	1 SH
ECE U604	Semiconductor Device Theory	4 SH
ECE U606	Integrated Circuit Fabrication	4 SH
ECE U622	Parallel and Distributed Processing	4 SH
ECE U626	Introduction to Image Processing and Pattern Recognition	4 SH
ECE U628	Computer and Telecommunication Networks	4 SH
with ECE U629	Internetworking Design Lab	1 SH
ECE U630	Introduction to Robotics	4 SH
ECE U638	Special Topics in Computer Engineering	4 SH
ECE U642	Antennas	4 SH
ECE U644	Microwave Networks	4 SH
ECE U646	Optics	4 SH
ECE U666	Digital Signal Processing	4 SH
with ECE U667	Lab for ECE U666	1 SH
ECE U672	Communication Systems 2	4 SH
ECE U680	Electric Drives	4 SH
ECE U682	Power Systems Analysis	4 SH
with ECE U683	Power Systems Lab	1 SH
ECE U684	Power Electronics	4 SH
ECE U686	Electrical Machines	4 SH
ECE U692	Introduction to Subsurface Sensing and Imaging	4 SH
ECE U694	Numerical Methods and Computer Applications	4 SH

REQUIRED BIOLOGY

Take one of the following groups of courses:

Anatomy and Physiology

BIO U117	Integrated Anatomy and Physiology 1	4 SH
BIO U118	Lab for BIO U117	1 SH
BIO U119	Integrated Anatomy and Physiology 2	4 SH
BIO U120	Lab for BIO U119	1 SH

Animal Physiology

BIO U551	Principles of Animal Physiology	4 SH
BIO U552	Lab for BIO U551	1 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

Integrated Dual Major in Electrical and Computer Engineering

Students may choose to major in both electrical and computer engineering by following the integrated dual-major program. Students take the required courses for both majors along with technical electives distributed among the areas of computer engineering; fields, waves, and optics; signals and systems; power engineering; and electronic circuits and devices.

BSEE Bachelor of Science in Electrical/Computer Engineering

ENGLISH REQUIREMENT

Complete the following course:

ENG U111	College Writing	4 SH
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and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

DUAL ELECTRICAL/COMPUTER ENGINEERING GENERAL EDUCATION

Mathematics and Science

PHYSICS 1 AND 2

Complete the following two courses with corresponding labs:

PHY U151	Physics for Engineering 1	5 SH
PHY U155	Physics for Engineering 2	5 SH

CHEMISTRY

Complete the following course:

CHM U151	General Chemistry for Engineers	4 SH
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CALCULUS 1 AND 2 FOR SCIENCE AND ENGINEERING

Complete the following two courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH

DISCRETE MATHEMATICS

Complete the following course:

MTH U230	Discrete Mathematics	4 SH
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DIFFERENTIAL EQUATIONS/LINEAR ALGEBRA

Complete the following course:

MTH U343	Differential Equations and Linear Algebra for Engineering	4 SH
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CALCULUS 3 FOR SCIENCE/ENGINEERS

Complete the following course:

MTH U341	Calculus 3 for Science and Engineering	4 SH
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ALGORITHMS AND DATA STRUCTURES

Complete the following course:

CS U215	Algorithms and Data Structures for Engineering	4 SH
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Arts and Humanities

Complete two courses from "College of Engineering Arts and Humanities Requirements" on page 163.

Humanities/Social Science Elective

Complete one course from the following departments: ARC, ART, CJ, ECN, ENG, MUS, PHL, POL, PSY, SOC, or THE.

ELECTRICAL/COMPUTER ENGINEERING MAJOR REQUIREMENTS

First-Year Engineering

Complete the following two courses:

GE U110	Engineering Design	4 SH
GE U111	Engineering Problem Solving and Computation	4 SH

General Engineering

Complete the following three courses:

GE U100	Introduction to the Study of Engineering	1 SH
ECE U300	Introduction to Engineering	1 SH

Co-op Education

ECE U500	Professional Issues in Engineering	1 SH
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Electrical Engineering Lab

Complete the following course:

ECE U401	Introduction to Electronic Engineering Lab	1 SH
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Linear Circuits

Complete the following course:

ECE U400	Linear Circuits	4 SH
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Electronics

Complete the following course with corresponding lab:

ECE U402	Electronics	4 SH
with ECE U403	Lab for ECE U402	1 SH

Digital Logic Design

Complete the following course with corresponding lab:

ECE U322	Digital Logic Design	4 SH
with ECE U323	Lab for ECE U322	1 SH

Linear Systems

Complete the following course with corresponding lab:

ECE U464	Linear Systems	4 SH
ECE U465	Lab for ECE U464	1 SH

Electromagnetic Fields and Waves

Complete the following course with corresponding lab:

ECE U440	Electromagnetic Fields and Waves	4 SH
with ECE U441	Lab for ECE U440	1 SH

Computer Architecture/Organization

Complete the following course:

ECE U324	Computer Architecture and Organization	4 SH
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Optimization Methods

Complete the following course:

ECE U326	Optimization Methods	4 SH
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Computer Networks

Complete the following course with corresponding lab:

ECE U628	Computer and Telecommunication Networks	4 SH
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with ECE U629 Internetworking Design Lab

1 SH

Noise and Stochastic Processes

Complete the following course:

ECE U468	Noise and Stochastic Processes	4 SH
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Communication Systems

Complete the following course:

ECE U572 Communications Systems 1 4 SH

Dual Electrical/Computer Engineering Technical Electives

Complete four 4-SH-equivalent courses from the following list.

Only one course may be from computer science.

ECE U300 to ECE U699

CS U370 Object-Oriented Design 4 SH

CS U390 Theory of Computation 4 SH

CS U430 Database Design 4 SH

CS U480 Systems and Networks 4 SH

CS U520 Artificial Intelligence 4 SH

CS U540 Computer Graphics 4 SH

CS U660 Programming Languages 4 SH

CS U665 Compilers 4 SH

CS U680 Topics in Operating Systems 4 SH

Capstone Design

Complete the following two courses:

ECE U790 Electrical Engineering Capstone 1 4 SH

ECE U792 Electrical Engineering Capstone 2 4 SH

GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

139 total semester hours required

Minimum 2.000 GPA required

**MECHANICAL, INDUSTRIAL,
AND MANUFACTURING ENGINEERING**

JOHN W. CIPOLLA JR., PhD

Donald W. Smith Professor of Engineering and Chair

PROFESSORS

George G. Adams, PhD

Ahmed A. Busnaina, PhD, *William Lincoln Smith Professor
of Mechanical Engineering*

Thomas P. Cullinane, PhD

Surendra M. Gupta, PhD

Yiannis A. Levendis, PhD

Mohamad Metghalchi, ScD

Ronald R. Mourant, PhD

Hamid Nayeb-Hashemi, PhD

John N. Rossettos, PhD

Allen L. Soyster, PhD

Mohammad E. Taslim, PhD

Yaman Yener, PhD

Ibrahim Zeid, PhD

ASSOCIATE PROFESSORS

Teiichi Ando, PhD

Nasser Fard, PhD

Jacqueline A. Isaacs, PhD

Sagar V. Kamarthi, PhD

Gregory J. Kowalski, PhD

Emanuel S. Melachrinoudis, PhD

Sinan Muftu, PhD

Uichiro Narusawa, PhD

Ronald F. Perry, PhD

ASSISTANT PROFESSORS

James C. Benneyan, PhD

Shiwoo Lee, PhD

PROFESSORS EMERITI

Alexander M. Gorlov, PhD

Thomas E. Hulbert, MS

Richard J. Murphy, PhD

SENIOR RESEARCH ENGINEER

Joseph T. Blucher, PhD

SENIOR RESEARCH SCIENTIST
AND PROFESSOR EMERITUS

Welville B. Nowak, PhD

The Department of Mechanical, Industrial, and Manufacturing Engineering offers two accredited programs leading to a Bachelor of Science in industrial engineering or a Bachelor of Science in mechanical engineering.

The overarching mission of the department is to organize the faculty, staff, curricula, facilities, and research programs to provide the highest-quality education for our students. At the undergraduate level, our goal is to provide rigorous, theoretically based but practice-oriented programs that effectively integrate classroom and laboratory instruction with the cooperative work experience. The educational objectives for both of our undergraduate degree programs are to: (1) educate students through a broad, theoretically based mechanical or industrial engineering curriculum; (2) support students in developing practical work skills involving current technology and technical tools, as well as an awareness of manufacturing, management and economic issues, and commonly accepted norms for professional conduct; (3) integrate academic learning with practice-oriented experience to promote professional development and career planning; (4) provide students with learning experiences that instill a passion for lifelong learning; (5) involve students in leadership and contributing roles in interactive team environments; (6) instruct students to be effective communicators with good interpersonal skills; and (7) integrate students' engineering course work with industrial, ethical, cultural, historical, and societal perspectives, leading to an appreciation of the broad educational objectives (as specified in the University's Academic Common Experience [ACE] goals).

Mechanical engineers will achieve the ability to work professionally in both thermal and mechanical systems areas, including the design and realization of such systems. Industrial engineers will demonstrate the ability to design, analyze, improve, and optimize integrated systems that include people, materials, information, equipment, and energy.

Industrial Engineering

Industrial engineering involves the design and analysis of systems that include people, equipment, and materials and their interactions and performance in the workplace. The industrial engineer collects this information and evaluates alternatives to make decisions that best advance the goals of the enterprise.

The program in industrial engineering offers students a base of traditional engineering courses such as production systems, work design, probability, statistics, and engineering economy, while emphasizing such contemporary areas as simulation, material handling, computer software, quality control, and operations research.

To gain the skills they need to make informed managerial and professional decisions, students take courses in management, economics, and technical subjects, as well as in the humanities and social sciences.

Industrial engineers work in manufacturing firms, hospitals, banks, public utilities, government agencies, insurance companies, and construction firms. Among the projects they undertake are design and implementation of a computer-integrated manufacturing system, design of a robotics system in a manufacturing environment, long-range corporate planning, development and implementation of a quality-control system, design of workstations to enhance worker safety and productivity, and development of computer systems for information control.

Co-op jobs generally increase in level of responsibility as students gain theoretical and technical knowledge through their academic work. A sophomore might begin as a computer analyst evaluating the performance of a manufacturing system and progress to designing manufacturing engineering workstations by the senior year. See pages 327–332 for course descriptions.

BSIE—Bachelor of Science in Industrial Engineering

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

INDUSTRIAL ENGINEERING GENERAL EDUCATION

Mathematics and Science

PHYSICS

Complete the following two courses with corresponding labs:

PHY U151 Physics for Engineering 1 5 SH

PHY U155 Physics for Engineering 2 5 SH

CHEMISTRY

Complete the following course:

CHM U151 General Chemistry for Engineers 4 SH

MATHEMATICS

Complete the following four courses:

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U242 Calculus 2 for Science and Engineering 4 SH

MTH U341 Calculus 3 for Science and Engineering 4 SH

MTH U343 Differential Equations and Linear Algebra 4 SH
for Engineering

Arts and Humanities

Complete two courses from “College of Engineering Arts and Humanities Requirements” on page 163.

INDUSTRIAL ENGINEERING MAJOR REQUIREMENTS

First-Year Engineering

Complete the following two courses:

GE U110 Engineering Design 4 SH

GE U111 Engineering Problem Solving 4 SH
and Computation

General Engineering

Complete the following three courses:

GE U100 Introduction to the Study of Engineering 1 SH

MIM U300 Introduction to Engineering 1 SH
Co-op Education

or GE U300 Introduction to Engineering 1 SH
Co-op Education

MIM U500 Professional Issues in Engineering 1 SH

or GE U500 Professional Issues in Engineering 1 SH

Industrial Engineering Fundamentals

Complete the following two courses:

MIM U310 Introduction to Industrial Engineering 4 SH

MIM U412 Engineering Probability and Statistics 4 SH

Information and Technology

Complete the following two courses:

MIM U420 Computers and Information Systems 4 SH

MIM U425 Engineering Database Systems 4 SH

Advanced Industrial Engineering

Complete the following eight courses with two corresponding labs:

MIM U510 Digital Simulation Techniques 4 SH

MIM U512 Engineering Economy 4 SH

MIM U515 Operations Research 4 SH

MIM U516 Quality Assurance 4 SH

MIM U520 Stochastic Modeling 4 SH

MIM U522 Human Machine Systems 4 SH

MIM U523 Lab for MIM U522 1 SH

MIM U525 Logistics and Supply Chain Management 4 SH

MIM U530 Manufacturing Systems and Techniques 4 SH

MIM U531 Lab for MIM U530 1 SH

Engineering Science/Design Electives

Choose two science/design engineering courses. See adviser for an approved list.

Capstone

Complete the following two courses:

MIM U701	Capstone Design 1	1 SH
MIM U702	Capstone Design 2	5 SH

INDUSTRIAL ENGINEERING GENERAL ELECTIVE REQUIREMENTS

Complete four 4-SH-equivalent, nonremedial, nonrepetitive courses chosen from the following departments: ACC, AFR, ARC, ART, ASL, BIO, CHE, CHM, CIN, CIV, CJ, CMN, CS, ECE, ECN, ED, ENG, ENT, ENV, FIN, GEO, HRM, HS, HST, IAF, INB, INT, IS, JRN, LIN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MGT, MIM, MKT, MMS, MSC, MTH, MUS, PHL, PHY, POL, PSY, SCM, SOA, SOC, or THE.

GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

138 total semester hours required

Minimum 2.000 GPA required

Mechanical Engineering

Mechanical engineering involves the design, development, and manufacture of machinery and devices to transmit power or to convert energy from thermal to mechanical form in order to power the modern world and its machines. Its current practice has been heavily influenced by recent advances in computer hardware and software.

Mechanical engineers use computers to formulate preliminary and final designs of systems or devices, to perform calculations that predict the behavior of the design, and to collect and analyze performance data from system testing or operation.

Traditionally, mechanical engineers have designed and tested such devices as heating and air-conditioning systems, machine tools, internal-combustion engines, and steam power plants. Today they also play primary roles in the development of new technologies in a variety of fields—energy conversion, solar energy utilization, environmental control, prosthetics, transportation, manufacturing, and new materials development.

The curriculum in mechanical engineering focuses on three areas: applied mechanics, thermofluids engineering, and materials science. Applied mechanics is the study of the motion and deformation of structural elements acted on by forces in devices that range from rotating industrial dynamos to dentists' drills. Thermofluids engineering deals with the motion of fluids and the transfer of energy, as in the cooling of electronic components or the design of gas turbine engines. Materials science is concerned with the relationship between the structure and properties of materials and with the control

of structure, through processing, to achieve the desired properties. Practical applications are in the development of composite materials and in metallurgical process industries.

Courses in each area form the foundation for advanced analytical and creative design courses that culminate in a two-semester capstone design project. Faculty encourage students throughout the curriculum to use computer-aided design tools and high-performance computer workstations.

Cooperative education assignments increase in responsibility and technical challenge as students progress through the program. Initial positions may involve computer-intensive CAD/CAM assignments or programming tasks, while more advanced jobs will place students in charge of quality-control systems and performance testing of equipment. See pages 327–332 for course descriptions.

BSME—Bachelor of Science in Mechanical Engineering**ENGLISH REQUIREMENT**

Complete the following course:

ENG U111	College Writing	4 SH
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and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

MECHANICAL ENGINEERING GENERAL EDUCATION*Mathematics and Science***PHYSICS**

Complete the following two courses with corresponding labs:

PHY U151	Physics for Engineering 1	5 SH
PHY U155	Physics for Engineering 2	5 SH

CHEMISTRY

Complete the following course:

CHM U151	General Chemistry for Engineers	4 SH
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MATHEMATICS

Complete the following four courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U343	Differential Equations and Linear Algebra for Engineering	4 SH

Arts and Humanities

Complete two courses from “College of Engineering Arts and Humanities Requirements” on page 163.

MECHANICAL ENGINEERING MAJOR REQUIREMENTS*First-Year Engineering*

Complete the following two courses:

GE U110	Engineering Design	4 SH
GE U111	Engineering Problem Solving and Computation	4 SH

General Engineering

Complete the following three courses:

GE U100	Introduction to the Study of Engineering	1 SH
MIM U300	Introduction to Engineering Co-op Education	1 SH
or GE U300	Introduction to Engineering Co-op Education	1 SH

MIM U500	Professional Issues in Engineering	1 SH
or GE U500	Professional Issues in Engineering	1 SH

Electrical Engineering

Complete the following course and corresponding lab:

ECE U210	Electrical Engineering	4 SH
with ECE U211	Lab for ECE U210	1 SH

Mechanical Engineering Fundamentals

Complete the following five courses and one corresponding lab:

MIM U315	Statistical and Economical Analyses in Engineering	4 SH
MIM U340	Introduction to Material Science	4 SH
MIM U341	Lab for MIM U340	1 SH
MIM U350	Engineering Mechanics and Design	4 SH
MIM U355	Mechanics of Materials	4 SH
MIM U380	Thermodynamics	4 SH

Advanced Mechanical Engineering

Complete the following seven courses:

MIM U455	Dynamics and Vibrations	4 SH
MIM U475	Fluid Mechanics	4 SH
MIM U505	Measurement and Analysis with Thermal Science Application	4 SH
MIM U508	Mechanical Engineering Computation and Design	4 SH
MIM U550	Mechanical Engineering Design	4 SH
MIM U555	System Analysis and Control	4 SH
MIM U570	Thermal Systems Analysis and Design	4 SH

Information Technology

Complete one course from the following list:

MIM U420	Computers and Information Systems	4 SH
MIM U425	Engineering Database Systems	4 SH
MIM U430	Object-Oriented Engineering Applications	4 SH

Capstone

Complete the following two courses:

MIM U701	Capstone Design 1	1 SH
MIM U702	Capstone Design 2	5 SH

MECHANICAL ENGINEERING GENERAL ELECTIVE REQUIREMENTS

Complete four 4-SH-equivalent, nonremedial, nonrepetitive courses chosen from the following departments: ACC, AFR, ARC, ART, ASL, BIO, CHE, CHM, CIN, CIV, CJ, CMN, CS, ECE, ECN, ED, ENG, ENT, ENV, FIN, GEO, HRM, HS, HST, IAF, INB, INT, IS, JRN, LIN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MGT, MIM, MKT, MMS, MSC, MTH, MUS, PHL, PHY, POL, PSY, SCM, SOA, SOC, or THE.

GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

140 total semester hours required

Minimum 2.000 GPA required

PART-TIME EVENING ENGINEERING

The part-time engineering program is designed to meet the needs of individuals who must combine full-time work responsibilities with part-time evening study. This six-year, part-time evening curriculum leads to a degree of Bachelor of Science in civil or mechanical engineering. Admissions and course requirements are identical to the full-time, five-year cooperative degree programs. For an application and more information, contact the Student Services Office, 220 Snell, 617.373.2154. The program coordinator is Joy Erb, MS.

ENGLISH REQUIREMENT

Complete the following course:

ENG U111	College Writing	4 SH
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and one approved Advanced Writing in the Disciplines course.

A grade of C is required in both courses.

CIVIL ENGINEERING GENERAL EDUCATION**Mathematics and Science****PHYSICS**

Complete the following two courses and corresponding labs:

PHY U151	Physics for Engineering 1	5 SH
PHY U155	Physics for Engineering 2	5 SH

CHEMISTRY

Complete the following course:

CHM U151	General Chemistry for Engineers	4 SH
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MATHEMATICS

Complete the following four courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U343	Differential Equations and Linear Algebra for Engineering	4 SH

ECONOMICS

Choose one course from the following list:

ECN U115	Principles of Macroeconomics	4 SH
or ECN U116	Principles of Microeconomics	4 SH

MATH AND SCIENCE ELECTIVES

Choose one course from the following list with corresponding labs as applicable:

BIO U121	Basic Microbiology	4 SH
BIO U151	Introduction to Marine Biology	4 SH
CHM U311	Organic Chemistry 1	5 SH
CHM U321	Analytical Chemistry	5 SH
CHM U401	Physical Chemistry 1	5 SH
CHM U403	Physical Chemistry 2	5 SH
GEO U400	Field Geology	4 SH
GEO U410	Geochemistry	4 SH
GEO U418	Geophysics	4 SH
GEO U582	Groundwater Geochemistry	4 SH
MIM U380	Thermodynamics	4 SH
MIM U455	Dynamics and Vibrations	4 SH

MIM U515	Operations Research	4 SH
MTH U481	Probability and Statistics	4 SH
MTH U581	Statistics and Stochastic Processes	4 SH

Arts and Humanities

See “College of Engineering Arts and Humanities Requirements” on page 163.

CIVIL ENGINEERING MAJOR REQUIREMENTS

First-Year Engineering

Complete the following two courses:

GE U110	Engineering Design	4 SH
GE U111	Engineering Problem Solving and Computation	4 SH

General Engineering

Complete the following course:

GE U500	Professional Issues in Engineering	1 SH
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Materials

Complete the following two courses:

CIV U260	Civil Engineering Materials	3 SH
CIV U262	Materials Lab PTE	1 SH

Structural Analysis and Design

Complete the following five courses:

MIM U350	Engineering Mechanics and Design	4 SH
MIM U355	Mechanics of Materials	4 SH
MIM U356	Lab for MIM U355	1 SH
CIV U320	Structural Analysis 1	4 SH
CIV U324	Reinforced Concrete Design	4 SH

Fluid Mechanics

Complete the following course:

MIM U475	Fluid Mechanics	4 SH
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Environmental Engineering and Soil Mechanics

Complete the following two courses and corresponding lab:

CIV U334	Environmental Engineering 1	4 SH
CIV U340	Soil Mechanics	4 SH
CIV U341	Lab for CIV U340	1 SH

Statistics and Engineering Economy

Complete the following course:

MIM U315	Statistical and Economical Analyses in Engineering	4 SH
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Civil Engineering Technical Electives

Choose four courses from the following list:

CIV U425	Steel Design	4 SH
CIV U522	Structural Analysis 2	4 SH
CIV U534	Environmental Engineering 2	4 SH
CIV U536	Hydrologic Engineering	4 SH
CIV U553	Transport Analysis and Planning	4 SH
CIV U554	Highway Engineering	4 SH
CIV U556	Traffic Engineering	4 SH
CIV U575	Construction Management	3 SH
with CIV U542	Foundation Engineering	4 SH

Capstone

Complete the following course:

CIV U769	Senior Design Project	5 SH
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CIVIL ENGINEERING GENERAL ELECTIVE REQUIREMENTS

Complete three 4-SH-equivalent, nonremedial, nonrepetitive courses chosen from the following departments: ACC, AFR, ARC, ART, ASL, BIO, CHE, CHM, CIN, CIV, CJ, CMN, CS, ECE, ECN, ED, ENG, ENT, ENV, FIN, GEO, HRM, HS, HST, IAF, INB, INT, IS, JRN, LIN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MGT, MIM, MKT, MMS, MSC, MTH, MUS, PHL, PHY, POL, PSY, SCM, SOA, SOC, or THE.

GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

UNIVERSITY-WIDE REQUIREMENTS

133 total semester hours required
Minimum 2.000 GPA required

BSME—Bachelor of Science in Mechanical Engineering—Part-Time Evening Program

ENGLISH REQUIREMENT

Complete the following course:

ENG U111	College Writing	4 SH
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and one approved Advanced Writing in the Disciplines course. A grade of C is required in both courses.

MECHANICAL ENGINEERING GENERAL EDUCATION

Mathematics and Science

PHYSICS

Complete the following two courses with corresponding labs:

PHY U151	Physics for Engineering 1	5 SH
PHY U155	Physics for Engineering 2	5 SH

CHEMISTRY

Complete the following course:

CHM U151	General Chemistry for Engineers	4 SH
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MATHEMATICS

Complete the following four courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U343	Differential Equations and Linear Algebra for Engineering	4 SH

Arts and Humanities

See “College of Engineering Arts and Humanities Requirements” on page 163.

MECHANICAL ENGINEERING MAJOR REQUIREMENTS

First-Year Engineering

Complete the following two courses:

GE U110	Engineering Design	4 SH
GE U111	Engineering Problem Solving and Computation	4 SH

Electrical Engineering

Complete the following course and corresponding lab:

ECE U210	Electrical Engineering	4 SH
ECE U211	Lab for ECE U210	1 SH

Mechanical Engineering Fundamentals

Complete the following five courses with corresponding labs:

MIM U315	Statistical and Economical Analyses in Engineering	4 SH
MIM U340	Introduction to Material Science	4 SH
MIM U341	Lab for MIM U340	1 SH
MIM U350	Engineering Mechanics and Design	4 SH
MIM U355	Mechanics of Materials	4 SH
MIM U356	Lab for MIM U355	1 SH
MIM U380	Thermodynamics	4 SH

Advanced Mechanical Engineering

Complete the following seven courses with corresponding labs:

MIM U455	Dynamics and Vibrations	4 SH
MIM U456	Lab for MIM U455	1 SH
MIM U475	Fluid Mechanics	4 SH
MIM U505	Measurement and Analysis with Thermal Science Application	4 SH
MIM U506	Lab for MIM U505	1 SH
MIM U508	Mechanical Engineering Computation and Design	4 SH
MIM U550	Mechanical Engineering Design	4 SH
MIM U555	System Analysis and Control	4 SH
MIM U570	Thermal Systems Analysis and Design	4 SH

Information Technology

Complete one course from the following list:

MIM U420	Computers and Information Systems	4 SH
MIM U425	Engineering Database Systems	4 SH
MIM U430	Object-Oriented Engineering Applications	4 SH

Capstone

Complete the following two courses:

MIM U701	Capstone Design 1	1 SH
MIM U702	Capstone Design 2	5 SH

MECHANICAL ENGINEERING GENERAL ELECTIVE REQUIREMENTS

Complete four 4-SH-equivalent, nonremedial, nonrepetitive courses chosen from the following departments: ACC, AFR, ARC, ART, ASL, BIO, CHE, CHM, CIN, CIV, CJ, CMN, CS, ECE, ECN, ED, ENG, ENT, ENV, FIN, GEO, HRM, HS, HST, IAF, INB, INT, IS, JRN, LIN, LNA, LNC, LNF, LNG, LNI, LNJ, LNL, LNM, LNR, LNS, MGT, MIM, MKT, MMS, MSC, MTH, MUS, PHL, PHY, POL, PSY, SCM, SOA, SOC, or THE.

GPA REQUIREMENT

Minimum 2.000 GPA required in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

UNIVERSITY-WIDE REQUIREMENTS

137 total semester hours required

Minimum 2.000 GPA required

School of Engineering Technology

WALTER W. BUCHANAN, PhD, JD, PE, *Director and Professor of Electrical Engineering Technology*

Roy Dalsheim, MEd, *Assistant Director*
 Rasma Galins, *Assistant Director*
 Christina Cuttle, MS, *Administrative Coordinator*

ASSOCIATE PROFESSOR

Eric W. Hansberry, MS, *Design Graphics*

ASSISTANT PROFESSORS

Randal August, MS, *Computer Engineering Technology*
 Francis A. Dibella, ME, *Mechanical Engineering Technology*
 Guido Lopez, PhD, *Mechanical Engineering Technology*

ASSOCIATE ACADEMIC SPECIALISTS

Vincent K. Butler, MS, *Computer Engineering Technology*
 Leonard F. Dow, MS, *Electrical Engineering Technology*
 Jerome Tapper, MS, PE, *Electrical Engineering Technology*

ASSISTANT ACADEMIC SPECIALIST

Joel R. Weinstein, BS, *Computer Engineering Technology*

The programs in the School of Engineering Technology concentrate on the applications of technology and emphasize the rational processes involved in converting theories and ideas into practical techniques, procedures, and products. Fundamentals are related to current practice, providing a supportive “why” for the practical “how.” The study of the humanities and social sciences helps students gain a balanced, well-rounded education.

Engineering technologists work with professional engineers, scientists, medical doctors, supervisors, and craftspersons to develop techniques for converting scientific knowledge and craftsmanship into products. The curriculum helps students understand the scientific principles that govern current technology; apply technology to problem solving; communicate effectively the important implications of technological advances; and acquire the motivation for continued development of technical skills.

The school offers five-year cooperative education programs in mechanical engineering technology, electrical engineering technology, and computer engineering technology—all leading to the degree of Bachelor of Science in engineering technology. A firm choice of major may be delayed until the spring semester of the freshman year.

The electrical and mechanical engineering technology baccalaureate day programs and the part-time baccalaureate programs in mechanical and electrical engineering technology are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET). The part-time programs leading to an Associate of Science in engineering degree with majors in electrical and mechanical engineering technology are also accredited by TAC/ABET.

Part-Time Evening and Weekend Programs

The part-time programs include courses, certificates, and degree programs leading to the Associate in Engineering (AE) and the Bachelor of Science in engineering technology (BSET). Certificates may be earned in computer technology, C++/UNIX specialist, electronics technology, and engineering graphics technology. The AE degree may be earned in computer engineering technology, electrical engineering technology, or mechanical engineering technology.

Students may also earn the BSET in computer technology, mechanical engineering technology, or electrical engineering technology, with a concentration in manufacturing.

For more information on part-time programs, contact Northeastern University, Lowell Institute School, 120 Snell

Engineering Center, Boston, MA 02115; call 617.373.2500 (voice), 617.373.8526 (TTY), 617.373.2501 (fax); e-mail info@lis.coe.neu.edu; or visit our Web site: www.coe.neu.edu/lis.

Class Entrance Requirements

The minimum overall grade-point averages listed are required for students to advance to the next rank and to graduate.

Sophomore	1.600
Middler	1.700
Junior	1.800
Senior	2.000
To graduate	2.000

A cumulative grade-point average of 2.000 or better in major courses is required for graduation. Students are expected to carry the normal prescribed curriculum for the program. Details on criteria for academic probation and suspension are available at 120 Snell Engineering Center.

Graduation Requirement

Students transferring from another college or university are not eligible to receive the degree until they have completed at least one academic year at Northeastern immediately preceding their graduation.

For more information about programs and requirements, visit the School of Engineering Technology at 120 Snell Engineering Center.

Minor in Computer Engineering Technology

To qualify for a minor in computer engineering technology, the student must complete the requirements listed under Minor in Computer Engineering Technology on page 182. A student does not have to be enrolled in the School of Engineering Technology to declare the minor, but the student must meet the published prerequisites for all courses.

Minor in Electrical Engineering Technology

To qualify for a minor in electrical engineering technology, the student must complete the requirements listed under Minor in Electrical Engineering Technology on page 184. A student does not have to be enrolled in the School of Engineering Technology to declare the minor, but the student must meet the published prerequisites for all courses.

Minor in Mechanical Engineering Technology

To qualify for a minor in mechanical engineering technology, the student must complete the requirements listed under Minor in Mechanical Engineering Technology on page 185. A student does not have to be enrolled in the School of Engineering Technology to declare the minor, but the student must meet the published prerequisites for all courses.

To obtain credit for a minor in engineering technology, students must file a petition form with the School of Engineering Technology in 120 Snell Engineering Center. Interested students should confer with an adviser as soon as possible. The adviser is Mr. Roy Dalsheim, 120 Snell, 617.373.2500.

COMPUTER ENGINEERING TECHNOLOGY

RANDAL AUGUST, MS

Coordinator for Computer Engineering Technology

Computer engineering technology's major functions include programming the computer for engineering, scientific, and business applications; designing, engineering, and testing computers; and interfacing computers with various types of equipment to enhance automation.

The computer engineering technology program provides degree candidates with both academic and technical learning experience relevant to the hardware and software systems currently used in industry. Students also choose technical electives in their area of interest. High-level theory courses enable students to continue their educational and professional development beyond the baccalaureate level. Some students go on to pursue master's degrees in either business administration or information systems.

A typical sophomore's cooperative education responsibilities might include setting up and configuring various computer platforms, installing software packages, providing phone support for technical inquiries, and performing elementary network troubleshooting and some software research. Other typical positions explore the various aspects of manufacturing processes, including assembly and quality assurance.

As seniors, typical students have progressed to more sophisticated and challenging assignments. They may be assigned the responsibility of maintaining entire software applications as well as the databases for these programs, or they may be asked to convert old versions of application scripts to conform to new coding principles. Other assignments may include providing advanced technical software and hardware support for end users both on and off site.

Graduates of this program are equipped to play important roles on engineering support teams that implement engineering design projects. They also work closely with engineers as members of research and production teams. See pages 223–226 for course descriptions.

BSET in Computer Engineering Technology

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH
and one approved Advanced Writing in the Disciplines course.
A grade of C or better is required in both courses.

SCHOOL OF ENGINEERING TECHNOLOGY
GENERAL EDUCATION

Diversity

Complete one course from the list “Approved Courses: Diversity” on page 44.

Communications

Complete one course from the communications department.

Humanities and Social Science

Choose two courses from the list “Approved Courses: Methods of Inquiry—Humanities Context” on page 43 and/or from the list “Approved Courses: Methods of Inquiry—Social World Context” on page 43.

Mathematics

Complete the following four courses:

MTH U110	College Algebra	4 SH
MTH U121	Precalculus	4 SH
MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U243	Calculus 2 for Engineering Technology	4 SH

Physics

Complete the following course with corresponding lab:

PHY U141	Physics for Engineering Technology	4 SH
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SCHOOL OF ENGINEERING TECHNOLOGY
REQUIRED COURSES

Breadth Courses

Complete the following four courses:

EET U201	Circuit Analysis 1	4 SH
GET U121	Computer Applications for Technology	4 SH
GET U131	Engineering Graphics 1	4 SH
MET U201	Statics	4 SH

Capstone Project

Complete the following two courses:

GET U681	Capstone Preparation	2 SH
GET U683	Capstone Design Project	4 SH

Co-op Experience

Complete the following two courses:

GET U111	Engineering Technology Cooperative	1 SH
GET U113	Career Management	1 SH

COMPUTER ENGINEERING TECHNOLOGY MAJOR

Introductory and Intermediate Courses

Complete the following seven courses:

CET U201	Visual Basic Programming	4 SH
CET U301	Introduction to C++ Programming	4 SH
CET U306	C++/Data Structures	4 SH
CET U311	Computer Organization and Architecture	4 SH
CET U321	Software Engineering	4 SH
CET U341	Digital Electronics Design	4 SH
CET U350	Embedded Microcomputer Systems 1	4 SH

Advanced Courses

Complete the following five courses:

CET U331	Assembly Language	4 SH
CET U521	Computer Architecture	4 SH
CET U531	Data Communications and Networks	4 SH
CET U546	Industry Hardware	4 SH
CET U651	Advanced Computer Concepts	4 SH

Technical Electives

Choose three courses from the computer engineering technology department.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in major courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Computer Engineering Technology

REQUIRED COURSES

Complete the following four courses:

CET U301	Intro to C++ Programming	4 SH
CET U306	C++/Data Structures	4 SH
CET U311	Computer Organization and Architecture	4 SH
CET U551	Operating Systems	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

ELECTRICAL ENGINEERING TECHNOLOGY

LEONARD F. DOW, MS

Coordinator for Electrical Engineering Technology

The focus of electrical engineering technology is the design and operation of equipment and systems related to power, communications, data processing, and electrical control. Its major functions include generating, transmitting, and distributing electrical energy for light and power purposes; developing and producing equipment for telephone, radio, television, radar, and communication; designing and constructing data-processing systems and analog or digital computers; and applying electrical and electronic devices in the control of processes and manufacturing.

The program in electrical engineering technology offers theory courses at the upper end of the technology spectrum, and students may take technical electives in areas that interest them.

A sophomore may be given the cooperative education assignment of creating and editing electrical blueprints, doing shell drawings, or providing ductwork drawings along with the appropriate heat-loading calculations for companies engaged in electrical construction. Other entry positions include assembly, breadboarding, inspection, and quality assurance.

Seniors typically have progressed to positions of much greater responsibility, such as installing and maintaining computer network systems, maintaining online base maps for public utility systems, and coordinating architectural and electrical plans with construction companies and suppliers. Students

have also had co-op positions in consulting engineering firms as analysts, telemarketers in sales engineering, and environmental safety compliance officers. See pages 263–266 for course descriptions.

BSET in Electrical Engineering Technology

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course.

A grade of C or better is required in both courses.

SCHOOL OF ENGINEERING TECHNOLOGY

GENERAL EDUCATION

Diversity

Complete one course from the list “Approved Courses:

Diversity” on page 44.

Communications

Complete one course from the communications department.

Humanities and Social Science

Choose two courses from the list “Approved Courses: Methods of Inquiry—Humanities Context” on page 43 and/or from the list “Approved Courses: Methods of Inquiry—Social World Context” on page 43.

Mathematics

Complete the following four courses:

MTH U110 College Algebra 4 SH

MTH U121 Precalculus 4 SH

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U243 Calculus 2 for Engineering Technology 4 SH

Economics

Complete the following course:

MIM U512 Engineering Economy 4 SH

Chemistry

Complete the following course:

CHM U151 General Chemistry for Engineers 4 SH

Physics

Complete the following course with corresponding lab:

PHY U141 Physics for Engineering Technology 4 SH

SCHOOL OF ENGINEERING TECHNOLOGY

REQUIRED COURSES

Breadth Courses

Complete the following four courses:

CET U201 Visual Basic Programming 4 SH

GET U121 Computer Applications for Technology 4 SH

GET U131 Engineering Graphics 1 4 SH

MET U201 Statics 4 SH

Capstone Project

Complete the following two courses:

GET U681 Capstone Preparation 2 SH

GET U683 Capstone Design Project 4 SH

Co-op Experience

Complete the following two courses:

GET U111 Engineering Technology Cooperative 1 SH

GET U113 Career Management 1 SH

ELECTRICAL ENGINEERING TECHNOLOGY MAJOR

Introductory and Intermediate Courses

Complete the following eight courses:

EET U201 Circuit Analysis 1 4 SH

EET U301 Circuit Analysis 2 4 SH

EET U311 Analog Electronics 1 4 SH

EET U316 Analog Electronics 2 4 SH

EET U321 Digital Electronics 1 4 SH

EET U331 Electrical Measurements 4 SH

EET U336 Engineering Analysis 4 SH

EET U341 Energy Conversion 4 SH

Advanced Courses

Complete the following five courses:

EET U521 Digital Computers 4 SH

EET U558 Distributive Systems 4 SH

EET U561 Control Engineering 4 SH

EET U566 Industrial Control Systems 1 4 SH

EET U570 Industrial Control Systems 2 4 SH

Technical Electives

Complete two courses from the electrical engineering technology department.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in major courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required

Minor in Electrical Engineering Technology

REQUIRED COURSES

Complete the following four courses:

EET U201 Circuit Analysis 1 4 SH

EET U311 Analog Electronics 1 4 SH

EET U321 Digital Electronics 1 4 SH

EET U566 Industrial Control Systems 1 4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

MECHANICAL ENGINEERING TECHNOLOGY

FRANCIS A. DIBELLA, MS

Coordinator for Mechanical Engineering Technology

As a technical field that deals with the use of machinery to harness power resources and perform useful work, mechanical engineering technology focuses on static forces, motion, and the kinetics of devices activated by hydraulic, electrical, mechanical, or thermodynamic forces.

Mechanical engineering technologists design and install machinery ranging from pocket watches to the largest energy-producing facilities. They help develop and produce engines and transport equipment such as automobiles, aircraft, ships, and railway cars. They also help construct and operate furnaces, boilers, and heating and air-conditioning equipment.

Students in mechanical engineering technology apply the principles of science and mathematics to their chosen fields and convert theories into practical techniques and processes. They learn how to communicate technical information effectively so they may become integral members of an engineer-technologist-technician design and operations team.

Sophomore mechanical engineering technology majors generally are referred to cooperative education positions such as technicians in facility or plant engineering departments, quality assurance positions in light and heavy manufacturing, and prototype development and design teams. A sophomore often will be given the responsibility of drawing mechanical designs and blueprints using various CAD software.

As seniors, these students have progressed to highly responsible positions in manufacturing and production, such as design and test technicians and field service engineers. See pages 323–325 for course descriptions.

BSET in Mechanical Engineering Technology

ENGLISH REQUIREMENT

Complete the following course:

ENG U111 College Writing 4 SH

and one approved Advanced Writing in the Disciplines course. A grade of C or better is required in both courses.

SCHOOL OF ENGINEERING TECHNOLOGY

GENERAL EDUCATION

Diversity

Complete one course from the list “Approved Courses: Diversity” on page 44.

Communications

Complete one course from the communication department.

Humanities and Social Science

Choose two courses from the list “Approved Courses: Methods of Inquiry—Humanities Context” on page 43 and/or from the list “Approved Courses: Methods of Inquiry—Social World Context” on page 43.

Mathematics

Complete the following four courses:

MTH U110 College Algebra 4 SH

MTH U121 Precalculus 4 SH

MTH U241 Calculus 1 for Science and Engineering 4 SH

MTH U243 Calculus 2 for Engineering Technology 4 SH

Economics

Complete the following course:

MIM U512 Engineering Economy 4 SH

Chemistry

Complete the following course:

CHM U151 General Chemistry for Engineers 4 SH

Physics

Complete the following course with corresponding lab:

PHY U141 Physics for Engineering Technology 4 SH

SCHOOL OF ENGINEERING TECHNOLOGY

REQUIRED COURSES

Breadth Courses

Complete the following five courses:

CET U201 Visual Basic Programming 4 SH

EET U201 Circuit Analysis 1 4 SH

GET U121 Computer Applications for Technology 4 SH

GET U131 Engineering Graphics 1 4 SH

GET U331 Engineering Graphics 2 4 SH

Capstone Project

Complete the following two courses:

GET U681 Capstone Preparation 2 SH

GET U683 Capstone Design Project 4 SH

Co-op Experience

Complete the following two courses:

GET U111 Engineering Technology Cooperative 1 SH

GET U113 Career Management 1 SH

MECHANICAL ENGINEERING TECHNOLOGY MAJOR

Introductory and Intermediate Courses

Complete the following six courses:

MET U201 Statics 4 SH

MET U301 Dynamics 4 SH

MET U311 Stress Analysis 4 SH

MET U321 Thermodynamics 4 SH

MET U341 Materials 4 SH

MET U351 Measurement and Analysis 4 SH

Advanced Courses

Complete the following three courses:

MET U521 Heat Transfer 4 SH

MET U531 Fluid Mechanics 4 SH

MET U651 Mechanical Design 4 SH

Technical Electives

Choose four courses from the mechanical engineering technology department.

MAJOR GPA REQUIREMENT

Minimum 2.000 GPA required in major courses.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION**UNIVERSITY-WIDE REQUIREMENTS**

130 total semester hours required

Minimum 2.000 GPA required

Minor in Mechanical Engineering Technology**REQUIRED COURSES**

Complete the following four courses:

MET U201	Statics	4 SH
MET U301	Dynamics	4 SH
MET U341	Materials	4 SH
MET U531	Fluid Mechanics	4 SH

GPA REQUIREMENTS

2.000 GPA required in the minor

School of General Studies

GEORGE R. ATKINSON, EDD, *Director of the School
and Associate Dean of University College*

Sally Solomon, BA, *Assistant Director*

Jeffrey B. Hannibal, MEd, *Coordinator for Academic
Support Services*

The School of General Studies (SGS) is designed for students who need help strengthening their basic skills while they take the required freshman-year course work in English, mathematics, and social and laboratory sciences.

Through the combination of a prescribed curriculum, small classes, low student-teacher ratio, and expert faculty, students follow a program that fits their academic and career goals. SGS faculty provide advice and participate in a “House Plan” in which they share information on each student’s progress.

The school helps SGS students excel at college work and prepare for academic success as upperclass Northeastern University students. SGS students transition as sophomores into their destination Northeastern college following successful completion of the SGS year. All SGS courses count toward graduation.

In preparation for gaining sophomore status, SGS students follow one of four curriculum tracks: arts and sciences or undecided, business, criminal justice, and health/science.

As with all full-time Northeastern students, SGS students have access to all physical education facilities and cocurricular programs, as well as to the nationally certified SGS Peer Tutoring Program, the Academic Assistance Center, the math and writing centers, and all available personal and academic support networks at the University.

Class Entrance Requirements

To qualify for sophomore status in their destination Northeastern college, SGS students must earn the required grade-point average and successfully complete a minimum of 33 semester hours of credit, as well as required courses.

Tuition and Fees

Tuition and fees for the School of General Studies are the same as for students in the full-time day colleges.

School of General Studies

ARTS AND SCIENCE TRACK

English Requirement

Complete the following two courses:

ENG U110 Introductory Writing 4 SH

ENG U111 College Writing 4 SH

Mathematics Requirement

Complete the following two courses:

MTH U110 College Algebra 4 SH

MTH U115 Applications of Algebra 4 SH

History Course

Complete the following course:

HST U110 Introduction to World History 4 SH

Sociology Course

Complete the following course:

SOC U101 Introduction to Sociology 4 SH

Integrated Language Skills

Complete the following two courses:

SGS U101 Strategic Thinking and Learning 4 SH

SGS U102 Strategic Thinking and Learning Seminar 1 SH

College Elective

Choose one undergraduate course.

CRIMINAL JUSTICE TRACK

English Requirement

Complete the following two courses:

ENG U110 Introductory Writing 4 SH

ENG U111 College Writing 4 SH

Mathematics Requirement

Complete the following course:

MTH U110 College Algebra 4 SH

History Course

Complete the following course:

HST U110 Introduction to World History 4 SH

Sociology Course

Complete the following course:

SOC U101 Introduction to Sociology 4 SH

Integrated Language Skills

Complete the following two courses:

SGS U101 Strategic Thinking and Learning 4 SH

SGS U102 Strategic Thinking and Learning Seminar 1 SH

Criminal Justice

Complete the following two courses:

CJ U101 Introduction to Criminal Justice 4 SH

CJ U102 Ethics, Values, and Diversity 4 SH

BUSINESS TRACK

English Requirement

Complete the following two courses:

ENG U110 Introductory Writing 4 SH

ENG U111 College Writing 4 SH

Mathematics Requirement

Complete the following two courses:

MTH U130 College Math for Business and Economics 4 SH

MTH U131 Calculus for Business and Economics 4 SH

History Course

Complete the following course:

HST U110 Introduction to World History 4 SH

Economics Course

Complete the following course:

ECN U115 Principles of Macroeconomics 4 SH

Integrated Language Skills

Complete the following two courses:

SGS U101 Strategic Thinking and Learning 4 SH

SGS U102 Strategic Thinking and Learning Seminar 1 SH

Management Course

Complete the following course:

CBA U101 Introduction to Business 4 SH

BOUVÉ HEALTH SCIENCE TRACK

English Requirement

Complete the following two courses:

ENG U110 Introductory Writing 4 SH

ENG U111 College Writing 4 SH

Mathematics Requirement

Complete the following two courses:

MTH U110 College Algebra 4 SH

MTH U115 Applications of Algebra 4 SH

Integrated Language Skills

Complete the following two courses:

SGS U101 Strategic Thinking and Learning 4 SH

SGS U102 Strategic Thinking and Learning Seminar 1 SH

Science Electives

Choose three courses from the following departments:

ATP, BIO, CES, CHM, GEO, MLS, MTH, NUR, PHY, PMD,
PSC, PTH, SLA, or TOX.

Course Descriptions

ACCOUNTING

COLLEGE OF BUSINESS ADMINISTRATION

ACC U201 Financial Accounting and Reporting 4 SH
Introduces financial accounting. The objective is to familiarize students with accounting terminology and methods so they are able to interpret, analyze, and evaluate the financial statements currently published in corporate annual reports. Covers the basic concepts underlying financial statements and the accounting principles followed in the preparation of the balance sheet, the income statement, and the statement of cash flows. Relates current economic and business events to the measurement of income, and helps the student to understand how financial reporting concepts affect the behavior of managers. *Prereq.* Second semester freshman or above.

ACC U277, ACC U278, ACC U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

ACC U301 Managerial Accounting 4 SH
Focuses on the development and use of information, especially financial information, for managerial decisions within the company. Introduces managerial accounting concepts, analyses, and practices that support business decisions through class discussions, exercises, and demonstration problems. Topics include budgeting, cost management and behavior, cost-volume-profit analysis, relevant costs for decision making, cost allocation issues including activity-based costing, and performance evaluation. Requires a field project examining cost issues in a business entity. *Prereq.* ACC U201.

ACC U401 Financial Reporting and Analysis 1 4 SH
Examines financial reporting concepts, emphasizing their link with financial statements. Focuses on both the preparation and interpretation of financial statements, with students being introduced to basic tools in financial statement analysis such as ratio and accounting analysis. Offers an overview of how management uses financial reporting decisions to influence reported income and asset and liability values, and provides the tools necessary to analyze the impact of alternative reporting decisions on financial statements. In addition to accounting majors, this course is ideal for students who wish to pursue careers in corporate finance, investment banking, investment management, or consulting. *Prereq.* ACC U201.

ACC U403 Accounting Information Systems 4 SH
Provides an understanding of accounting information systems with an emphasis on the role of technology and risk analysis. Addresses concepts and applications relating to the design, analysis, and implementation of accounting systems. The role of e-commerce and Internet-based technologies is examined throughout the course. *Prereq.* ACC U301.

ACC U412 Auditing and Other Assurance Services 4 SH
Focuses on issues relevant to the public accounting profession and to internal auditors and managers in private or governmental organizations. Topics include legal liability and ethics; business and audit risk assessment; fraud detection and prevention procedures; planning of audit engagements; audit reports; other assurance services and reports; and the effect of information technology on the audit process. Offers students the opportunity to think critically about issues facing the auditing profession and studies the audit judgment and decision-making process through the completion of a variety of audit cases. *Prereq.* ACC U201.

ACC U414 Income Tax Determination 4 SH
Provides a basic understanding of the structure of the federal income tax system as it relates to different taxable entities. Taxes can have a significant impact on the viability of a number of personal finance and business decisions. The focus of the course is the individual taxpayer, but the implications for corporate taxpayers and other flow-through entities are also considered. Tax return projects, research cases, and planning projects help demonstrate the potential impact of taxes on decision making. *Prereq.* ACC U201.

ACC U416 Strategic Cost Analysis 4 SH
Develops understanding of the critical role of cost measurement and management in business decisions and in managing a firm's profitability. Focuses on the strategic use of cost information for planning and controlling, as well as costing products, services, and customers. Emphasizes the role of management accountants as integral members of decision-making teams and as consultants to senior management. Studies alternate ways of measuring costs to meet different management objectives, the role of budgeting as a planning and management tool, and the use of cost analysis as a control tool to help management meet short- and long-term profit objectives. In addition to accounting majors, this course is ideal for students who wish to pursue a career in finance, general management, operations management, supply chain management, or entrepreneurship. *Prereq.* ACC U301.

ACC U477, ACC U478, ACC U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

ACC U501 Financial Reporting and Analysis 2 4 SH
Continues ACC U401. Provides a more extensive understanding of financial statements and the financial reporting rules underlying them. Topics include international accounting, pensions, leases, earnings per share, and earnings management. Students are introduced to more advanced financial statement analysis tools and continue to gain the knowledge necessary to analyze the impact of alternative reporting decisions on financial statements. *Prereq.* ACC U401.

ACC U602 Fraud: The Dark Side of Business 4 SH
Examines the pervasiveness and causes of fraud and white-collar crime in our society. Explores the types of fraud and fraud schemes that affect individuals and business enterprises, methods of fraud detection/investigation/prevention, and the concept of fraud risk management. Topics include legal aspects of fraud, Ponzi and pyramid schemes, securities fraud, computer fraud, health-care fraud, asset misappropriation, and fraudulent financial reporting. *Prereq. Honors program participation.*

ACC U604 Global Financial Statement Analysis 4 SH
Provides an overview of financial reporting and accounting methods used for businesses around the world. The accounting choices and games differ, terminology and practices in disclosing the profits and asset values differ, and the interpretation of financial reports requires understanding of the cultures before one can assess the financial performance of a business. Designed to enhance the ability of a user of financial statements in a global setting to understand the statements and to be aware of issues that can make them incomparable or misleading. *Prereq. Honors program participation.*

ACC U606 Big Picture Accounting 4 SH
Helps students make managerial decisions, such as pricing, product design, or make-or-buy decisions, using accounting information—especially data on product and service costs—in combination with input from other corporate functions. Offers students the opportunity to combine knowledge gained about costs with knowledge of operations, finance, marketing, the overall organization, and the competitive context to make sound business decisions. Examines a variety of companies facing the challenge of managing in a global economy in the Information Age. Discusses how to implement, in an international and multicultural context, the action plans generated from analyzing complex information. Tests action plans for consistency with critical goals such as quality, customer focus, and continual improvement. *Prereq. Honors program participation.*

ACC U677, ACC U678, ACC U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ACC U921 Independent Study 1 SH
ACC U922 Independent Study 2 SH
ACC U923 Independent Study 3 SH
ACC U924 Independent Study 4 SH
Allows students who have received approval to undertake independent study in lieu of any course required in the various concentrations. Students present proposals to an Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study

takes place. A copy of the final report prepared by the student is presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from concentration coordinators. *Prereq. Permission of instructor.*

ACC U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

ACC U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. ACC U970 and honors program participation.*

AFRICAN-AMERICAN STUDIES

COLLEGE OF ARTS AND SCIENCES

AFR U100 College: An Introduction 1 SH
Intended for freshmen in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

AFR U101 African-American Studies 4 SH
Explores several of the possible historical, sociological, cultural, and political avenues of study in the broad interdisciplinary spectrum of African-American studies. Provides an introductory overview of the field and offers an opportunity to identify areas for more specific focus.

AFR U104 Survey of African-American Music 4 SH
Explores the various musical traditions of African Americans, with a specific focus on the United States. Examines the impact of African, European, and Native American traditions on African-American music as well as the role of music as an expression of African-American aesthetics, traditions, and life. Considers historical and contemporary forms of African-American musics, with selected video presentations of musical styles.

AFR U109 Foundations of Black Culture 1 4 SH
Studies music, literature, visual and performing arts, and other cultural and artistic traditions as they have evolved among African, African-American, and Caribbean peoples.

- AFR U112 Jazz 4 SH
Examines the evolution of the creative, improvisational musical style commonly called jazz, from its African-American roots to its status as one of America's classical musics and an internationally valued art form. Explores the contributions of African and European musical traditions and African-American spirituals, work songs, and blues. Examines major contributors and stylistic development and change through selected audio and audio-visual presentations. Also considers the sociocultural dynamics that have affected musical evolution and acceptance.
- AFR U128 Music of Africa 4 SH
Surveys various African musical traditions with respect to their historical, social, and cultural heritage. Examines traditional and contemporary African musics, instruments, and performance traditions.
- AFR U131 Music of Latin America and the Caribbean 4 SH
Examines the highly diverse and unique musical practices of South America, Latin America, and the Caribbean. Focuses on the traditions of native, African, and European heritage in these geographical areas. Provides exposure to musical repertoires, ideas about music, the relationship of music to culture, musical instruments, musical contexts, and musical syncretism.
- AFR U140 African-American History 4 SH
Surveys the development of African Americans in the United States from their African background to the present. Covers medieval and early modern societies in West and Central Africa; the transatlantic slave trade; the evolution of slavery from the colonial period through the Civil War; free blacks; Reconstruction; migration; civil rights; and black nationalism. Considers gender relations throughout the entire period and emphasizes how a historical perspective helps to inform discussions of contemporary issues.
- AFR U180 African History 4 SH
Explores the history of the African continent from 1000 C.E. to the present era. Topics include medieval kingdoms (Ghana, Mali, Songhai, Zimbabwe, the city-states of East Africa, and the Kongo kingdom); slave trades (Indian Ocean, trans-Saharan, and transatlantic); the partition of Africa and European colonization; and the decolonization process. Due consideration is given to the interactions of African peoples with the rest of the world, particularly the relations between Africa and Europe after 1500 C.E.
- AFR U185 Gender in the African Diaspora 4 SH
Studies variations in gender roles throughout the African Diaspora, from precolonial Africa to the modern United States. Areas of the African Diaspora include Africa, the West Indies, Latin America, Europe, and the Islamic world. Issues include sexuality, labor, reproduction, and social constructions of gender.
- AFR U208 Jazz Improvisation 4 SH
Focuses on repertoire as well as performance. Examines the great improvisational artists in American music such as Charlie Parker, Miles Davis, and John Coltrane. Approaches analysis from a theoretical as well as a practical perspective. Explores the use of rhythm, chords, scales, and modes in the creative improvisation process.
- AFR U212 History of Race 4 SH
Explores the creation, modification, and clash of racial identities in the modern world. Shows the worldwide patterns of racial discrimination and reform in the past three centuries, and how they are changing today. Discusses development of racial categories, and ideas and practices in racial mixing. Explores racial desegregation and persecution, and campaigns against racial discrimination. Includes background on human evolution and debates on the origins and meaning of physical differences among humans.
- AFR U220 African-American Theatre 4 SH
Surveys the history of African-American theatre artists in the United States from the time of Ira Aldridge to the present day. Also examines the works of African-American playwrights from the Harlem Renaissance to the present, with an emphasis on the period beginning with Baraka's *Dutchman*.
- AFR U261 The Modern Caribbean 4 SH
Focuses on the social, economic, and cultural forces that have shaped the character of the Caribbean people. Examines the variety of societies, cultures, and institutions of the region in their historical and contemporary settings, beginning with pre-Columbian cultures and moving through the colonial period, plantation agriculture, slavery, the expansion of U.S. influence, urbanization, economic development models, authoritarian politics, and the contemporary migration of Caribbean people to the United States and Europe.
- AFR U270 Economic Status of Ethnic Minorities 4 SH
Examines the economic conditions and processes as they impact minorities within the U.S. economy. Considers the role of national economic policies undertaken to address general economic and social conditions, as well as policies targeted at minority markets and institutions. Emphasis is on empirical analysis; historical and cultural materials may be incorporated.
- AFR U277, AFR U278, AFR U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- AFR U301 Foundations of Black Culture 2 4 SH
Continues AFR U109. Provides an interdisciplinary approach to the cultural production of African-based traditions in the Americas and elsewhere in the African Diaspora. Forms of cultural production include film, theatre, the visual arts, literary arts, and dance. While several issues in theory and practice in

the arts are discussed, emphasis is on the ways in which an African-based tradition is rooted in the intellectual and cultural histories of African descendants in the United States, the Caribbean, South and Central America, and Great Britain.

Prereq. AFR U109.

AFR U307 Africa Today 4 SH
Studies the complex political and social picture of Africa. Examines some of the salient features of black art, politics, and identity in Africa. *Prereq.* *Sophomore standing or above.*

AFR U310 Applied Research in the African Diaspora 4 SH
Introduces students to three major types of evidence used in basic and applied research in Africa and its worldwide Diaspora: written documentation; orally gathered information; and visual materials, artifacts, and material culture. Covers methods of data gathering such as archival research, participant observation, interviews, and archaeological excavation. Discusses various qualitative and quantitative techniques of verifying, analyzing, interpreting, and reporting or displaying the research findings. Emphasis is on selecting types of evidence and techniques of analysis appropriate to the topics selected. In addition to reading examples of research on Africa, and on the African Diaspora in Europe, Asia, Latin America, and the Caribbean, students usually develop their own research projects. *Prereq.* *Sophomore standing or above.*

AFR U312 Black History of Boston 4 SH
Examines the social, economic, political, and educational history of Boston's black community in the nineteenth and twentieth centuries. The development of the black community and its institutions is a major focus, and students are encouraged to study the past in an attempt to understand the present and interpret the future. Research data include participant observation, oral history, interviews, and primary and secondary source materials. *Prereq.* *Sophomore standing or above.*

AFR U320 The Black Family 4 SH
Studies how the black family functions, both interpersonally and as a social unit. Anthropological and sociological theories deal with variations in family structure and the function of the black family in black society. The effects of slavery and colonization on the black family structure and functions are also explored. Discusses some of the differences and similarities between African, African-American, and African-Caribbean families. *Prereq.* *Sophomore standing or above.*

AFR U325 African-American Women 4 SH
Examines themes and topics in the history of African-American women using an interdisciplinary approach. Themes and topics include women's lives in precolonial Africa, their role in the transatlantic slave trade, women and American slavery, community and institution building after Emancipation, black women and labor, stereotypes of black women, black women and civil rights, and black women today. *Prereq.* *Sophomore standing or above.*

AFR U337 African-American History before 1900 4 SH
Covers the development of black America from slavery through the Booker T. Washington–W. E. B. DuBois controversy, with emphasis on the historical links between Africa and America that have shaped the African-American experience. Includes in-depth discussion of slavery's impact, the role of the antebellum free black, the Civil War and Reconstruction, and the black response to the new racism of the late nineteenth century. *Prereq.* *Sophomore standing or above; an introductory history course is strongly recommended.*

AFR U338 African-American History since 1900 4 SH
Examines the modern development of black America, with major emphasis on the twentieth century and the rising tide of African-American nationalism. Provides an historical perspective regarding key contemporary issues including the founding of the National Association for the Advancement of Colored People (NAACP), the Marcus Garvey back-to-Africa movement, the Harlem Renaissance, the Black Muslims, the impact of Martin Luther King Jr., and the idea of Black Power. *Prereq.* *Sophomore standing or above; an introductory history course is strongly recommended.*

AFR U339 Analysis of American Racism 4 SH
Discusses the cycle by which racism in our institutions helps form our attitudes and the manner in which our attitudes, in turn, shape our institutions. Emphasizes the practical, day-to-day aspects of racism, rather than the theoretical and historical. *Prereq.* *Sophomore standing or above.*

AFR U344 Contemporary Black Politics 4 SH
Analyzes the evolution of black political thought in the United States and examines the sociopolitical contexts that have served as catalysts to modern black political movements. *Prereq.* *Sophomore standing or above.*

AFR U345 The Black Experience in the Caribbean 4 SH
Offers a descriptive and interpretive analysis of the growth of the modern black community in the Caribbean. Although the focus is the contemporary period, the course examines that period in the context of colonialism and slavery in the Americas. Important racial, social, political, economic, and religious issues are addressed. *Prereq.* *Sophomore standing or above.*

AFR U350 History of Blacks in the Media and the Press 4 SH
Offers a historical and visual examination of the development of the African-American experience in the U.S. mass media and press. Analyzes contemporary and historical literature, films, and people with respect to history, racism, images, psychology, and social movements. Newspapers, film, television, and radio are prime focal points, and are used to help form strategies for the future of black Americans. *Prereq.* *Sophomore standing or above.*

- AFR U360 Politics of Poverty 4 SH
Explores how and why there is poverty, how it affects people's lives, and how it can be eliminated. Examines the relations between poverty, racial and ethnic factors, and the economic, political, and administrative systems. Evaluates a number of alternatives and provides an opportunity for clarifying individual assumptions and feelings about poverty. *Prereq. POL U150 is recommended.*
- AFR U365 Blacks and Jews 4 SH
Compares the black and Jewish experiences in the United States. Themes include remembered slavery and commemoration of freedom; Holocaust and genocide; religious expressions of politics; black-Jewish relations; and black Judaism. *Prereq. POL U150 is recommended or any other introductory social science course.*
- AFR U367 Race and Social Identity 4 SH
Provides an interdisciplinary look at the social, political, and psychological factors shaping contemporary African-American identity. Explores several different factors that interact with blackness to shape the diversity of African-American experience, such as skin color, gender, culture, and class. Studies black identity as it has been conceptualized, measured, and researched by psychologists. Readings include essays written by important African-American thinkers, fiction, and autobiographical narratives, as well as empirical research in the field of psychology. *Prereq. Sophomore standing or above.*
- AFR U390 Africa and the World in Early Times 4 SH
Addresses the place of Africa in the world, from human evolution to the establishment of large-scale iron-making societies. Examines debates on the evolution of man in Africa and migrations to other regions. Traces the formation and spread of language groups, the rise of agriculture, formation of family and political structures, and patterns of trade up to 1000 C.E. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- AFR U391 Modern African Civilization 4 SH
Explores African history and culture from the early 1500s to the present era. Emphasizes the relationship between Europe and Africa, the circumstances surrounding the imperialist partition of Africa, and the decolonization process. *Prereq. Sophomore standing or above.*
- AFR U392 African Diaspora 4 SH
Explores the creation and transformation of the African Diaspora—connections among communities of African descent in Africa, the Americas, Europe, and Asia. Centers on the years from 1500 to the present and emphasizes connections among themes of migration, identity, and popular culture. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- AFR U399 Black Community and Social Change 4 SH
Explores the dynamic changes experienced by black communities in the United States since the civil rights era in the 1950s and 1960s. Includes discussions and applications of key concepts and methods in several fields of the social sciences, and seeks to understand the relationship of race, class, gender, and social change in addressing the current search for policies and programs for community development. *Prereq. Sophomore standing or above.*
- AFR U402 African-American English 4 SH
Addresses topics in the study of African-American English or Ebonics. Investigates the hypotheses about the origins of African-American English as well as arguments about the relationship of the dialect to English and other languages. Considers issues regarding the use of the dialect in schools. *Prereq. LIN U150 or ENG U150 and sophomore standing or above.*
- AFR U410 Religion and Spirituality in the African Diaspora 4 SH
Examines religious thought and rituals and its Diaspora in a comparative context. Topics include traditional religions, Islam, Christianity and Judaism in Africa, and the Diaspora. Emphasizes the transformation of religions practiced in Africa when African captives were forced into the three slave trades affecting the continent of Africa: trans-Saharan, Indian Ocean, and transatlantic. *Prereq. Sophomore standing or above.*
- AFR U414 The Black Novel 4 SH
Focuses on the black novelist's place in the history of American fiction. Emphasis is given to Chesnutt, Toomer, Wright, Ellison, and contemporary novelists, and to their different perceptions of the black experience in America. *Prereq. Sophomore standing or above.*
- AFR U415 Black Poetry and the Spoken Word 4 SH
Focuses on the black poet's place in the history of American poetry. Considers black poetry as both written words and spoken words. *Prereq. Sophomore standing or above.*
- AFR U422 Blacks in Science and Medicine 4 SH
Studies the contributions that African Americans have made to the development of science and technology in America. Examines the cultural and social factors that have encouraged blacks to work in the fields of science (biology, chemistry, physics, and medicine) and technology (engineering). Certification of blacks within the U.S. scientific community and the availability of science to the past and contemporary African-American communities are also explored. Uses readings, discussions, individual research topics, and interviews with black scientists, inventors/engineers, and doctors. *Prereq. Sophomore standing or above.*
- AFR U424 Black Pandemics/Epidemiology of Disease 4 SH
Examines the role of disease and medicine among continental African peoples and African-derived populations in the Americas and elsewhere in the African Diaspora. Emphasis is on such epidemic diseases as malaria, yellow fever, smallpox, and the current AIDS pandemic. Also explores the susceptibilities and resistances (both acquired and inherited) to certain diseases among particular populations within the African Diaspora. *Prereq. Sophomore standing or above.*

- AFR U428 African Languages 4 SH
Seeks to prepare students for serious theoretical and practical study of the West African language and literature known as Kwa, the largest language subgroup in the Niger-Congo family. Explores the classification of African languages, the application of basic linguistics, and the history of these languages in Africa and the Western hemisphere, all leading to an introduction to spoken Yoruba and Igbo. *Prereq. LIN U150 or ENG U150 and sophomore standing or above.*
- AFR U441 Third World Political Relations 4 SH
Offers a comparative regional analysis of the political systems of Third World nations of Africa, Asia, Latin America, and the Caribbean. Emphasis is on development strategies; problems of development, including national identity, political socialization and participation, national defense, and urbanization; and the positions of Third World nations in the international community. *Prereq. Sophomore standing or above.*
- AFR U454 Black Elderly in the Americas 4 SH
Examines in historical context the economic, health-care, and cultural issues surrounding the aging process among blacks in the Americas, with emphasis on the United States. Identifies the treatment of elders in traditional African societies, major diseases with differential incidence among the black elderly (such as cardiovascular disease and diabetes), racial health disparities, and institutions that African Americans have developed to cope with the conditions of elderly blacks. *Prereq. Sophomore standing or above.*
- AFR U455 Racism and American Criminal Justice 4 SH
Provides students with an overview of the role and treatment of racial/ethnic minorities in the criminal justice system. Provides students with historical and theoretical frameworks for understanding the relationship between race, crime, and criminal justice. In doing so, students become familiar with trends and patterns in criminal offending by racial/ethnic minorities, as well as system response to such behavior. *Prereq. Sophomore standing or above.*
- AFR U458 Labor, Unions, and Work in Black Society 4 SH
Focuses on the nature and meaning of work in black society in the United States, especially the interface between black workers and organized labor. Explores the long-term exclusion of black workers from many unions affiliated with the American Federation of Labor (AF of L) in the late nineteenth and early twentieth centuries; the efforts of industrial unions affiliated with the Congress of Industrial Organizations (CIO); the rise of such black unions as the Brotherhood of Sleeping Car Porters; and more recent efforts to organize public employees. *Prereq. Sophomore standing or above.*
- AFR U460 Contemporary Government and Politics in Africa 4 SH
Explores contemporary politics in African nations south of the Sahara. Studies South Africa, Nigeria, Kenya, and Ethiopia, among others. Examines apartheid, colonialism, Afro-Marxism, chieftaincy, development, and Pan-Africanism. *Prereq. POL U155 and sophomore standing or above.*
- AFR U470 Identity and Nationalism in Africa 4 SH
Studies how centuries of imperialism, the struggle for national unity, and the continuing problems of racism and rivalry between factions have affected the present identities and nationalist movements in Africa. Explores problems peculiar to Africa and to any group of nations struggling against colonial ideas. Tribalism and the effects of European colonial partition on African identity are discussed. *Prereq. Sophomore standing or above.*
- AFR U472 Black Consumer Trends 4 SH
Examines consumption patterns among U.S. African Americans by class, age, gender, and region. How do producers of goods and services determine what black consumers will buy? Do corporations and advertisers attempt to steer and shape the behavior of black consumers? Have black consumers mobilized their consumption power to shape or influence corporate or public policy? *Prereq. Sophomore standing or above.*
- AFR U474 Black Enterprise and the Corporate World 4 SH
Studies the history and contemporary status of black entrepreneurship in the United States. Explores the kinds of businesses in which African Americans have succeeded; some of the largest and most profitable black-controlled corporations and businesses; and the status of blacks in banking. Is there a glass ceiling in mainstream corporate America for black Americans? What role does gender play in negotiating the corporate ladder? In addition to conducting their own research, students interact with a series of black businesspeople and corporate executives who share their experiences and insights. *Prereq. Sophomore standing or above.*
- AFR U477, AFR U478, AFR U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- AFR U485 Educational Issues/Black Community 4 SH
Focuses on some of the important issues in today's urban elementary and secondary education systems. Examines the historical development of these issues, and students are encouraged to think about and discuss the issues' future significance. *Prereq. Sophomore standing or above.*
- AFR U500 Arts of the African Diaspora 4 SH
Traces the historical development of the art forms and production practices of the African Diaspora, from traditional to contemporary styles in Africa, the Americas, and elsewhere in the African Diaspora. Emphasizes the study of art objects, the historical and social context in which aesthetic issues are shaped, and the impact of religion and external forces on creativity. Uses lectures, critiques, discussions, fieldwork, and hands-on interaction with art objects. *Prereq. 64 SH toward degree or junior or senior standing.*

AFR U501 Contemporary Issues: Hip-Hop Culture 4 SH
 Surveys the global impact of hip-hop culture on a new generation of young people. Begun in the 1970s and 1980s in the United States as a cross-cultural expression of black and Puerto Rican traditions, it has become a major force worldwide. Using an interdisciplinary and practice-oriented approach, addresses such issues as youth identity formation, the role of women and gender in rap music, and the use of novel expressive forms. The combination of fieldwork and weekly critiques on contemporary public debates (such as censorship and the U.S. Constitution, violence and aggression, and sexism and misogyny) yield a final document to be presented to the University community and to be deposited in the Twenty-First Century Hip-Hop Library and Archive Project. *Prereq. 64 SH toward degree or junior or senior standing.*

AFR U533 Field Research Seminar 4 SH
 Enables advanced students to design and execute research studies in the field utilizing such methods as community surveys, courtroom observation, archival research, archaeological excavation, and participant observation. Includes performance studies. *Prereq. 64 SH toward degree or junior or senior standing.*

AFR U544 Seminar in Black Leadership 4 SH
 Enables students to conduct in-depth studies of significant black leaders—male and female—in a wide range of fields. Focuses on black leadership in the political arena as elected officials, leaders of pressure groups, leaders of protest organizations, black nationalist organizations, and feminist/womanist groups, and as advisers to political parties and presidential administrations. *Prereq. 64 SH toward degree or junior or senior standing.*

AFR U549 Public Policy and Black America 4 SH
 Examines the impact of public policy on African Americans and the role of African Americans in the formulation of public policy. These roles include protest, interest group politics, electoral politics, and blacks as policy researchers and advisers. The process of public policy formulation as it affects blacks is explored through a series of case studies ranging from the formulation and enforcement of fugitive slave laws in the pre-Civil War era to strategic military and foreign policy, affirmative action, welfare reform, and reparations in our own time. *Prereq. 64 SH toward degree or junior or senior standing.*

AFR U585 Current Issues in the African Diaspora 4 SH
 Introduces students to present-day issues and problems that confront various segments of the worldwide African Diaspora. Includes the social, political, and economic aspects of the experiences of Africans in the Diaspora. Students are asked to assess the validity of several social theories in relation to the African Diaspora. *Prereq. 64 SH toward degree or junior or senior standing.*

AFR U588 Literature in Context 4 SH
 Places writers in the context of a special theme; for example, students might discuss a group of writers influenced by their

common interest in psychoanalysis, by their social consciousness, or by an interest in the settlement of America. *Prereq. ENG U111 or equivalent.*

AFR U600 Contemporary Issues: Race, Science, and Technology 4 SH

Examines the social impact of diverse forms of technological development and application that will have sweeping effects on the everyday lives of individuals, groups, governments, and societies in the twenty-first century. The global, transforming effects of technology as it affects communities of color in the United States and internationally are explored in three main areas: the computer, DNA, and quantum revolutions. Topics include the digital divide, minority media ownership, human cloning, the “dot.com” phenomenon, race and cultural representations in cyberspace, and biopiracy. Lectures, class discussions, fieldwork, and interaction with leaders in these various fields are integral elements of the course. *Prereq. 64 SH toward degree or junior or senior standing.*

AFR U607 History of East Africa 4 SH

Deals with the precolonial period and the problems of the partition of Africa. Also focuses on the classical colonial period and the transformations of colonial policy after World War II, with particular emphasis on the ambiguity of decolonization and those features of the colonial system that seem to have become a part of the East African social and political environment. *Prereq. 64 SH toward degree or junior or senior standing.*

AFR U608 History of West Africa 4 SH

Studies the history of West Africa and its struggle for internal unity, economic development, and social justice. The Pan-Africanist ideology, W. E. B. DuBois's writings, African socialism, and the consolidation of power and leadership are some of the topical objectives in this study of African liberation, particularly the rise of West Africa. *Prereq. 64 SH toward degree or junior or senior standing.*

AFR U609 History of South Africa 4 SH

Studies precolonial South Africa and the conflict between Africans and the Dutch and English settlers. Focuses on the formation and transformation of colonial policy after World War II, with particular emphasis on racism, neocolonialism, liberation movements, and international involvement in the apartheid system. *Prereq. 64 SH toward degree or junior or senior standing.*

AFR U618 Laboratory in Community Psychology 4 SH

Familiarizes students with some of the research methods employed by psychologists and other scientists working in the area of community psychology. Community psychologists study people in their social contexts, with emphasis on the mutual influences that individuals and communities have upon each other. Rather than attempt to understand and treat problems at the individual level, research in community psychology aims to offer practical solutions to social problems, focusing on prevention. Familiarizes students with a particular community, which they utilize for data collection. Students

develop survey instruments/interview schedules, collect data, and analyze and interpret the findings with a qualitative design if possible. *Prereq.* PSY U320, PSY U406, and 64 SH toward degree or junior or senior standing.

AFR U639 Globalism, Racism, and Human Rights 4 SH
Explores the historical stages of globalization as a geopolitical and social phenomenon having significant impact on social change. Focuses on multiple effects of racism and the gradual emergence of human rights as an extension of basic freedoms internationally. Topics and themes include the African and Latino Diaspora, North-South debates, gender, Third World countries, democratization, poverty, health care/pandemic disease, censorship, political repression, new development strategies, and the role of the United Nations and other international organizations in increasingly complex societies. *Prereq.* 64 SH toward degree or junior or senior standing.

AFR U640 Topics in African-American History 4 SH
Covers special topics in African-American history. *Prereq.* 64 SH toward degree or junior or senior standing.

AFR U642 Topics in African-American Art History 4 SH
Explores special topics in African-American art history in this advanced seminar. *Prereq.* 64 SH toward degree or junior or senior standing.

AFR U645 National Model OAU/African Union 4 SH
Focuses on intra-African relations and the roles of Africans in international affairs, emphasizing the new African Union (AU) that replaced the Organization of African Unity (OAU). Examines the Pan-Africanist origins, challenges, and achievements of the African Union. A major component of the course is students' participation in the National Model African Union in Washington, D.C., involving briefings at African embassies and simulations of the organs of the AU. *Prereq.* 64 SH toward degree or junior or senior standing.

AFR U663 Early African-American Literature 4 SH
Surveys the development and range of black American writers, emphasizing poetry and prose from early colonial times to the Civil War. *Prereq.* 64 SH toward degree or junior or senior standing.

AFR U670 Modern African-American Literature 4 SH
Surveys the development and range of black American writers in poetry and prose from the post-Civil War period to the present. *Prereq.* ENG U111 or equivalent.

AFR U677, AFR U678, AFR U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

AFR U690 Topics in African History 4 SH
Covers special topics in African history. *Prereq.* Junior or senior standing.

AFR U700 Advanced Seminar 4 SH
Offers students the opportunity to prepare a professional research paper under the close supervision of a scholar interested in students' particular research areas. The senior thesis is required of all African-American studies majors. Fulfills experiential education requirement. *Prereq.* Senior standing.

AFR U900 Seminar: Authors in the African Diaspora 4 SH
Enables students to conduct in-depth studies of significant bodies of work—both fiction and nonfiction—by individual authors of the African Diaspora, such as Chinua Achebe, W. E. B. DuBois, Toni Morrison, Richard Wright, Zora Neal Hurston, Frantz Fanon, and Leopold Senghor. *Prereq.* Permission of instructor.

AFR U911 Jazz Ensemble 1 SH
Designed to serve both music majors and nonmajors, this is a performance/theory/history offering of the varied styles and techniques of performance in the jazz tradition of African-American musics. Students are admitted to the course by permission of the instructor following an interview and/or audition. Students are drawn from all segments of the University. Repertory is taken from the standard jazz literature as well as investigations of new works. Improvisational and interpretational technique are the core content of the course. Both the NU Jazz Ensemble and the NU Jazz Combo are represented in this course. *Prereq.* Permission of instructor.

AFR U921 Directed Study 1 SH
AFR U922 Directed Study 2 SH
AFR U923 Directed Study 3 SH
AFR U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq.* Permission of instructor.

AFR U945 AAMARP Practicum 4 SH
Offers students mentoring by artists-in-residence at the African-American Master Artists in Residency Program (AAMARP). Students gain hands-on studio experience mainly in the graphic and visual arts and in the preparation and management of artistic exhibitions mounted at the AAMARP gallery and other local and regional venues where AAMARP artists exhibit their work. *Prereq.* Permission of instructor.

AFR U954 Experiential Education Directed Study 4 SH
Draws upon the student's approved experiential activity and integrates it with study in the academic major.

AFR U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq.* Honors program participation.

AFR U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq.* AFR U970 and honors program participation.

AIR FORCE ROTC

AIR U110 Foundations of the U.S. Air Force 1 1 SH
 Examines the role of the United States Air Force in the contemporary world. Surveys background, mission, and organization of the Air Force and functions of United States strategic forces. Also emphasizes development of written communication skills.

AIR U111 Leadership Laboratory 1 0 SH
 Introduces the customs, traditions, and courtesies of the Air Force through guest speakers, seminars, and a field trip to an Air Force base.

AIR U120 Foundations of the U.S. Air Force 2 1 SH
 Continues study of the contemporary Air Force by examining general-purpose forces, aerospace support forces, and the total force structure.

AIR U121 Leadership Laboratory 2 0 SH
 Continues AIR U111. Emphasizes the role and responsibilities of an Air Force company grade officer. *Prereq.* AIR U111.

AIR U210 Evolution of U.S. Air Force Air and Space Power 1 1 SH
 Traces the historical development of air power and its uses starting before the Wright brothers and extending through the Korean War. Concentrates on the advent of the air age, the airplane at war (1914–1918), the interwar years, air power in World War II, the Berlin Airlift, air power in the Korean War, and the evolution of air power concepts and doctrine. Emphasizes student participation and presentations to enhance communication skills.

AIR U211 Leadership Laboratory 3 0 SH
 Emphasizes development of techniques used to direct and inform. Assigns students to leadership and management positions in the AIR U111 programs previously described.

AIR U220 Evolution of U.S. Air Force Air and Space Power 2 1 SH
 Traces the historical development of air power and its uses starting after the Korean War and continuing through its present role in international policies. Emphasizes experiences from the Vietnam conflict and Operations Desert Shield and Desert Storm. Continues emphasis upon student participation and presentations to enhance communication skills.

AIR U221 Leadership Laboratory 4 0 SH
 Continues AIR U211. Adds a special program in preparation for field training. *Prereq.* AIR U211.

AIR U310 U.S. Air Force Leadership Studies 1 3 SH
 Examines management and leadership from the point of view of the Air Force junior officer. Covers the individual motivational and behavioral processes, leadership, communication, and group dynamics to provide a foundation for the development of the junior officer's professional skills as an Air Force officer.

AIR U311 Leadership Laboratory 5 0 SH
 Focuses on exercise of management functions in planning, supervising, and directing cadet group activities. Provides students the opportunity to acquire proficiency in military leadership skills.

AIR U320 U.S. Air Force Leadership Studies 2 3 SH
 Continues AIR U310. Offers special emphasis on the basic managerial processes involving decision making, use of analytical aid in planning, organizing, and controlling in a changing environment. Discusses organizational and personal values, management of forces in change, organizational power, politics, and managerial strategy and tactics in the context of the military organization. Uses actual Air Force cases to enhance the learning and communication processes. *Prereq.* AIR U310.

AIR U321 Leadership Laboratory 6 0 SH
 Continues AIR U311. Offers students the opportunity to prepare themselves for professional duties. *Prereq.* AIR U311.

AIR U410 National Security Affairs 3 SH
 Studies the role of the military in maintaining the security of the United States. Examines the international environment, the background of defense policy, strategy, and forms of conflict. Addresses specific issues including weapons acquisition, arms control, nuclear deterrence, and the national military decision-making process. Emphasizes developing communication skills through student presentations.

AIR U411 Leadership Laboratory 7 0 SH
 Provides supervisory practice and exercise of leadership functions in controlling and directing activities of the cadet group. Develops leadership potential in a practical, supervised training lab.

AIR U420 Preparation for Active Duty 3 SH
 Studies the military's role as an institution in a democratic society. Topics include civil-military interaction and the military as a profession. Emphasizes developing communication skills through student presentations.

AIR U421 Leadership Laboratory 8 0 SH
 Continues AIR U411. Emphasizes supervisory and leadership skills. Discusses advantages of an Air Force career. *Prereq.* AIR U411.

ARCHITECTURE

COLLEGE OF ARTS AND SCIENCES

- ARC U100 College: An Introduction 1 SH
Intended for freshmen in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.
- ARC U111 History of World Architecture 1 4 SH
Introduces selected examples of world architecture and urbanism. Emphasizes historic development of architecture, building types, stylistic characteristics, and relations between architectural works and the cultures that produce them.
- ARC U112 History of World Architecture 2 4 SH
Continues ARC U111. Introduces selected examples of world architecture and urbanism. Emphasizes historic development of architecture, building types, stylistic characteristics, and the relations between architectural works and the cultures that produce them. *Prereq.* ARC U111.
- ARC U223 American Architecture 4 SH
Offers an introduction to the history, theory, and criticism of American architecture and urban planning from the mid-1600s to the 1930s. Explores the social and cultural forces that shape the built environment. Examines European influences as well as uniquely American contributions. Emphasizes the work of Louis Sullivan, H. H. Richardson, and Frank Lloyd Wright.
- ARC U256 Manual Representation 4 SH
Introduces architectural drawing techniques, tools, and materials. Includes lettering and dimensioning; and orthographic, axonometric, and one- and two-point perspective.
- ARC U257 Digital Representation 4 SH
Introduces CAD processes for two- and three-dimensional modeling for architectural design. Studies computer-aided design techniques that support site and program analysis concept and schematic design, and design development and construction drawing applications. Requires lab fee. *Prereq.* ARC U256.
- ARC U277, ARC U278, ARC U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.
- ARC U310 Studio 1: Site, Type, Composition 6 SH
Studies how to analyze, draw, and model the built environment. Students engage in issues of program, composition, type, and material. Offers students the opportunity to think conceptually about architectural design. *Prereq.* ARC U256 and ARC U257.
- ARC U311 Studio 2: Pattern and Urban Design 6 SH
Continues ARC U310. Studies how to analyze, model, and intervene in the city. Students engage in issues of figure/ground, mass, language, and sequence, understanding the city first as pattern, then as rhetoric and image. Projects include proposed alterations to public spaces and the Boston waterfront. *Prereq.* ARC U310.
- ARC U325 Nineteenth-Century Architecture and Urbanism 4 SH
Surveys the development of modern architecture in the United States and Europe from the mid-eighteenth to the late nineteenth century. Discusses architecture and urban design in the context of their cultural responses to society's changing conditions. Includes field trips. *Prereq.* Previous architectural history course or permission of instructor.
- ARC U326 Twentieth-Century Architecture and Urbanism 4 SH
Examines the forms and principles of European and American architecture of the twentieth century, emphasizing the work of Frank Lloyd Wright, Mies Van Der Rohe, Le Corbusier, and Louis Kahn; and such influential movements as the Dutch de Stijl, Russian constructivism, and American postmodernism and deconstruction. Includes field trips. *Prereq.* Previous architecture course or permission of instructor.
- ARC U329 American Houses and Housing 4 SH
Examines the architecture of American houses from first settlements of European colonists in the sixteenth century to issues in the 1900s. Aims to uncover the ways that architecture, seen through the lens of a particular building type, responds to the demands of materials, climate and geography, ethnic traditions, artistic expression, and changing societal forms. *Prereq.* Previous architectural history course or permission of instructor.
- ARC U330 Third-Year Seminar 4 SH
Encourages students to develop the connections between critical attitudes and techniques in design, through important historical texts. Offers a kind of “great books” approach to the integration of design and history, introducing the writings and seminal designs of Alberti, Palladio, Wright, Le Corbusier, Semper, Sitte, Rowe, Colquhoun, Moneo, Koolhaas, Rossi, Frampton, Venturi and Scott-Brown, Scarpa, and Lynch. *Prereq.* ARC U311 and ARC U326.
- ARC U356 Structures 1: Statics 4 SH
Introduces the theory of materials and structures. Examines basic structural elements in masonry and wood construction. Uses historic and current building types to explore the relationship between structure, materials, construction process, and architectural space. Includes lectures, discussions, field trips, and student presentation of structural models and diagrams. *Prereq.* PHY U151 and MTH U241.

ARC U357 Structures 2: Tectonics 4 SH
Introduces the theory of materials and structures. Examines basic structural elements in masonry and wood construction. Uses historic and current building types to explore the relationship between structure, materials, construction process, and architectural space. Includes lectures, discussions, field trips, and student presentation of structural models and diagrams. *Prereq. PHY U151 and MTH U241.*

ARC U358 Modeling and Design Communication 4 SH
Builds on CAD (computer-aided design) skills to develop ability to model in three dimensions and develop surfaces and lighting. Also addresses strategies in design communication for effective presentation of digital material. *Prereq. ARC U257.*

ARC U410 Studio 3: Building beyond the City 6 SH
Continues ARC U311. Studies how to analyze, draw, and model the suburban and exurban environment. Students engage in issues of rhetoric, image, landscape, and time. Projects include strategizing new urban types in order to reintroduce public life into the commercial landscape of suburbia. *Prereq. ARC U311.*

ARC U411 Option Studio 1 6 SH
Offers special content necessary to effect the transition from the quarter system to the semester system. Used by itself or in combination with ARC U412 to reconcile the new studio sequence with the old. *Prereq. ARC U311.*

ARC U412 Option Studio 2 6 SH
Offers special content necessary to effect the transition from the quarter system to the semester system. Used by itself or in combination with ARC U411 to reconcile the new studio sequence with the old. *Prereq. ARC U311.*

ARC U477, ARC U478, ARC U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ARC U510 Studio 4: Housing and Aggregation 6 SH
Continues ARC U410. Provides an understanding of multiunit housing in the United States and Europe. Students work in teams to develop new patterns of housing for Boston-area sites, and develop those sites with their own individual interventions. *Prereq. ARC U410.*

ARC U511 Studio 5: Tectonics 6 SH
Continues ARC U510. Focuses on the materials and making of architecture. Considers architectural connections at all scales, from the nut and bolt to the scale of a door or window, to the scale of the whole building and the city. Unlike traditional design studios that produce a schematic design before considering constructional ideas, this studio grounds design proposals upon a tectonic strategy. *Prereq. ARC U510.*

ARC U555 Environmental Systems 4 SH
Explores the ways in which architectural form can create particular conditions of light and shadow; provide shelter from heat, cold, and rain; and incorporate systems that provide for water, electricity, and sanitation. Provides a series of small-scale design projects. The program for the design projects is simple and straightforward. *Prereq. ARC U357.*

ARC U656 Integrated Building Systems 4 SH
Studies how to integrate into students' building designs all the environmental and tectonic systems that they have learned in previous architecture courses. *Prereq. ARC U357.*

ARC U677, ARC U678, ARC U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ARC U921 Directed Study 1 SH
ARC U922 Directed Study 2 SH
ARC U923 Directed Study 3 SH
ARC U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

ARC U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

ARC U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. ARC U970 and honors program participation.*

ARMY ROTC

ARM U110 Foundations of Officership 1 SH
Introduces students to issues and competencies that are central to a commissioned officer's responsibilities. Establishes a framework for understanding officership that includes leadership, army values, and "life skills" such as physical fitness and time management. *Coreq. ARM U111.*

ARM U111 Foundations of Officership Lab 1 SH
Accompanies ARM U110. Introduces basic soldier skills and introduces squad-level tactical operations in Leadership Lab. Students also participate in physical fitness training one to three days per week. *Coreq. ARM U110. Prereq. ROTC program only.*

- ARM U120 Basic Leadership 1 SH
Establishes foundation of basic leadership fundamentals such as problem solving, communications, briefings and effective writing, goal setting, techniques for improving listening and speaking skills, and an introduction to counseling. *Coreq. ARM U121.*
- ARM U121 Basic Leadership Lab 1 SH
Accompanies ARM U120. Introduces basic soldier skills and introduces squad-level tactical operations in Leadership Lab. Students also participate in physical fitness training one to three days per week. *Coreq. ARM U120. Prereq. ROTC program only.*
- ARM U130 Map Reading and Land Navigation 1 SH
Explores the fundamentals of map reading and land navigation. Offers students the opportunity to locate and explain legend information in order to identify topographical symbols on a military map. Topics include plotting and measuring directional azimuths, converting azimuths, identifying terrain features, and locating unknown points using intersection and resection techniques. Covers how to navigate in unfamiliar terrain using a map and compass; skills essential for National Advanced Leadership Camp. *Coreq. ARM U131.*
- ARM U131 Map Reading and Land Navigation Lab 1 SH
Accompanies ARM U130. Exercises the skills developed in ARM U130 in an outdoor environment in Leadership Lab. Students also participate in physical fitness training one to three days per week. *Coreq. ARM U130 (if enrolled in the Army ROTC program). Prereq. ROTC program only.*
- ARM U301 Individual Leadership Studies 3 SH
Offers students the opportunity to identify successful leadership characteristics through observation of others and self through experiential learning exercises. Students record observed traits (good and bad) in a dimensional leadership journal and discuss observations in small group settings. *Prereq. ROTC program only.*
- ARM U302 Leadership and Teamwork 3 SH
Examines how to build successful teams, various methods for influencing action, effective communication in setting and achieving goals, the importance of timing the decision, creativity in the problem-solving process, and obtaining team buy-in through immediate feedback.
- ARM U501 Leadership and Problem Solving 4 SH
Gives students the opportunity to conduct self-assessment of leadership style, develop personal fitness regimen, and learn to plan and conduct individual/small unit tactical training while testing reasoning and problem-solving techniques. Students receive direct feedback on leadership abilities. *Prereq. Basic course or equivalent military experience: prior service, JROTC, USAR, ARNG, ROTC, Leader's Training course.*
- ARM U502 Leadership and Ethics 4 SH
Examines the role communication, values, and ethics play in effective leadership. Topics include ethical decision making, consideration of others, spirituality in the military, and Army leadership doctrine. Emphasis is on improving oral and written communication abilities. *Prereq. ARM U501.*
- ARM U503 American Military History 3 SH
Focuses on the employment of the armed forces while examining the underlying factors that affected warfare, starting in the seventeenth century. Begins with European warfare and concludes with the issues facing the United States military today. Provides significant coverage of military operations and innovations to warfare. Encourages new ideas, thoughts, and creative discussion from students. *Prereq. ARM U120.*
- ARM U504 Contemporary Army Operations 2 SH
Introduces the roles and organization of the United States Army's Active, Reserve, and National Guard components. Uses these concepts as building blocks to discuss United States Army doctrine and tactics, and examines recent and ongoing military operations around the world. *Prereq. ARM U120.*
- ARM U601 Leadership and Management 4 SH
Develops student proficiency in planning and executing complex operations, functioning as a member of a staff, and mentoring subordinates. Students explore training management, methods of effective staff collaboration, and developmental counseling techniques. *Prereq. ARM U502.*
- ARM U602 Transition to an Army Officer 2 SH
Covers case study analysis of military law and practical exercises on establishing an ethical command climate. Students complete a semester-long Senior Leadership Project that requires them to plan, organize, collaborate, analyze, and demonstrate their leadership skills. *Prereq. ARM U502.*
- ARM U901 Independent Military Studies 2 SH
Offers independent study under direction of department staff. Intended for terms abroad. Students research the organization, characteristics, and mission of the military forces of the country where they are studying abroad. Emphasis is on recent and current operations in a regional and/or global context as well as engagement activities with the United States military. *Prereq. Basic course or equivalent military experience: prior service, USAR, ARNG, ROTC, Leader's Training Course.*

VISUAL ARTS

COLLEGE OF ARTS AND SCIENCES

- ART U100 College: An Introduction 1 SH
Intended for freshmen in the College of Arts and Sciences. Introduces freshmen to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

ART U101 History of Art before 1400	4 SH	Introduces the history of painting, sculpture, architecture, and related arts through a study of masterpieces of Western art from prehistoric times to the end of the Middle Ages. Provides an opportunity for students to become familiar with specific works, styles, and terminology of art before 1400, and to develop an ability to communicate about the visual arts. <i>Coreq. ART U102.</i>	photography, painting, video, and film as related to the fundamentals of composition, space relationships, effects of color, form, pattern repetition, structure, figure-ground relationships, balance, and unity.
ART U102 Lab for ART U101	0 SH	Accompanies ART U101. Covers topics from the course through various experiments. <i>Coreq. ART U101.</i>	ART U131 Visual Studies Foundation 2
ART U103 History of Art since 1400	4 SH	Introduces the history of painting, sculpture, architecture, and related arts through a study of masterpieces of Western art from the end of the Middle Ages to the present. Offers students the opportunity to become familiar with specific works, styles, and terminology of art. Emphasizes communication about the visual arts. <i>Coreq. ART U104.</i>	4 SH Continues ART U130. Explores three-dimensional form. Examines principles including mass, volume, line, plane, and texture. Introduces basic materials and structure through constructing models and prototypes. Presents sequential exercises with simple eye/hand skills and form recognition. Explores complex projects that require an understanding of context, content, and developing original forms.
ART U104 Lab for ART U103	0 SH	Accompanies ART U103. Covers topics from the course through various experiments. <i>Coreq. ART U103.</i>	ART U160 Photography 1
ART U106 Introduction to Art	4 SH	Offers an introduction to the characteristics of the visual arts including painting, sculpture, graphic arts, and architecture. Studies various examples of works of art as means of understanding style and techniques. Includes visits to museum collections and contemporary art galleries.	4 SH Covers all aspects of photography in a combined lecture/lab course format including the invention of photography, optics, black-and-white and color processing and printing, digital imaging, and computer output. <i>Prereq. ART U130.</i>
ART U115 Art and Society	4 SH	Offers an examination of the way in which societal forces and political ideologies are expressed in the visual arts, especially in painting, sculpture, and the graphic arts. Combines a broad overview of selected historical periods with an in-depth investigation of key monuments.	ART U175 Animation Basics
ART U124 Basic Drawing	4 SH	Offers freehand drawing instruction. Focuses on developing a formal understanding of the structure of objects and figures as well as increased dexterity with a variety of drawing tools. Includes experiments with materials such as wash, charcoal, and pencil.	4 SH Offers an introductory studio course that explores the creative potential of animation. Exposes students to a variety of traditional animation processes and techniques through lectures, demonstrations, and hands-on assignments. Provides a historical survey of animation art through the twentieth century. Emphasizes using the computer to develop concepts creatively while learning the fundamental skills of constructing animated images and forms. <i>Prereq. ART U290.</i>
ART U127 Basic Painting	4 SH	Presents an introductory studio course in the fundamental techniques of painting. Formal problems in the study of color, light, space systems, form, and composition establish the foundation for more individual creative expression. Uses critiques and slide lectures as needed.	ART U180 Video Basics
ART U130 Visual Studies Foundation 1	4 SH	Offers an introductory lecture/studio course clarifying basic principles, language, and concepts inherent in visual language systems. Concentrates on two-dimensional media including	4 SH Introduces video production techniques. Covers the creative and technical elements of field production, camera operation, nonlinear editing, lighting, composition, and directing methods. <i>Prereq. ART U130.</i>
			ART U240 History of Graphic Design
			4 SH Provides an understanding of the development of graphic design, focusing primarily on the events of the twentieth century that gave rise to the profession and influenced its maturation. Encourages students to interpret the ideas behind the historical record through lectures, readings, discussions, and projects. Considers the context, theories, and issues of graphic design's continuing evolution while exploring the moral and ethical aspect of the designer's role in shaping mass communication. <i>Prereq. ART U101.</i>
			ART U275 Animation Studio 1
			4 SH Introduces the fundamentals of three-dimensional computer animation. Class lectures and demonstrations are followed by substantial hands-on exploration. Students gain fundamental skills for modeling, surfacing, and animating. Projects progress from creating simple geometric objects to realistic organic characters. Basic systems for animating are introduced and explored. <i>Prereq. ART U175 and ART U290.</i>

- ART U277, ART U278, ART U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- ART U290 Introduction to Digital Tools 4 SH
Extends the study of visual problem solving by introducing the computer as a tool for design and image making. Weekly classes and labs in the electronic studios allow investigation into the medium's potential, limitations, and relationship to other media. Issues of sequencing, transformation, and motion through time and space are emphasized, with examination of their relevance to a broad spectrum of applications and disciplines. *Prereq. ART U130.*
- ART U300 Ancient Art 4 SH
Offers an overview of the painting, sculpture, and architecture of ancient Egypt, Mesopotamia, Greece, and Rome, with special emphasis on the historical forces that shaped them. *Prereq. One prior course in art history is recommended.*
- ART U303 Medieval Art and Architecture 4 SH
Focuses on Romanesque and Gothic art and architecture from the tenth to the fifteenth centuries. *Prereq. One prior course in art history is recommended.*
- ART U305 Renaissance Art 4 SH
Focuses on European visual arts of the fifteenth and sixteenth centuries, with particular attention to the social and economic forces that shaped them. *Prereq. One prior course in art history is recommended.*
- ART U307 Baroque Art 4 SH
Examines the visual arts of the seventeenth and eighteenth centuries in Europe. The relationship of visual culture to political, social, and economic developments is emphasized. Includes museum visits. *Prereq. One prior course in art history is recommended.*
- ART U310 Nineteenth-Century Art 4 SH
Explores art from 1780 to 1900. Considers developments such as neoclassicism, romanticism, realism, impressionism, and symbolism in terms of major changes in society: industrialization, Parisian urbanism, photography, Japonisme, the status of women, and the institutions of art. Emphasizes French painting, but developments in Europe and the Americas are considered. Includes museum visits. *Prereq. One prior course in art history is recommended.*
- ART U313 Twentieth-Century Art 4 SH
Surveys principal movements in European and American art from 1900 to the present. Presents a thematic approach, exploring fauvism, cubism, abstraction, dadaism and surrealism, modernist paradigms, and postmodern interventions. Course is writing intensive. Includes visits to museums and galleries. *Prereq. ART U103.*
- ART U319 Gender and the Visual Arts 4 SH
Explores the role of gender in the visual arts including such topics as women as creators, subjects, and patrons, and issues of art, gender roles, and sexuality. Concentrates on three distinct periods: early modernism through surrealism; the Renaissance; and contemporary culture. *Prereq. One prior course in art history is recommended.*
- ART U320 American Art 4 SH
Offers a broad survey of the history of American painting and sculpture from the seventeenth century to the present. Explores the social and cultural forces as well as the aesthetic and intellectual concerns that shape the evolution of art in the United States. Includes frequent visits to the Museum of Fine Arts and the Isabella Stewart Gardner Museum. *Prereq. One prior course in art history is recommended.*
- ART U329 History of Printmaking 4 SH
Surveys the techniques and development of printmaking in Europe and the United States from the earliest print media to the present, and explores the various implications of the multiplied image on paper. From their inception around 1400 in Europe, the graphic media have established social functions and aesthetic criteria that differ considerably from those of painting, sculpture, and architecture. *Prereq. One prior course in art history is recommended.*
- ART U330 History of Photography 4 SH
Explores photography from its origins in 1839 to its maturity after World War II. Examines technological advances, the documentary aesthetic, art photography, and theoretical approaches to the study of the medium. Photographs are studied as art objects, personal statements, and historical artifacts. Includes museum visits. *Prereq. ART U103 and ART U106.*
- ART U332 Design Principles and Drawing 4 SH
Explores conceptual principles underlying the professional practice of design including visual problem solving, terminology, and methodology. Explores constructive drawing, which is used in graphic design to investigate creative alternatives. *Prereq. ART U130.*
- ART U333 Design 1 and Drawing 4 SH
Applies graphic design principles to the correlation of forms with their function, content, and context. Explores a variety of media including letterform photographic image making and manipulation, and three-dimensional forms as elements of visual solutions. Exposes students to many forms of visual expression including artists' books and moving images. Constructive drawing is explored in the context of graphic designers' needs. *Prereq. ART U160, ART U332, and ART U334.*
- ART U334 Typography 1 4 SH
Introduces letterforms in visual communication. Studies typography as form and explores visual principles affecting organization and access of typographic information. Introduces use of the typographic grid and issues of hierarchy and legibility

through assigned projects, readings, and lectures. Includes the historical evolution of typefaces and their classification as a rational system. Guides students in the application of typography as the basis of graphic design. *Prereq.* ART U130.

ART U335 History of Film 4 SH
Surveys major international developments in film from the late nineteenth century to the present. Examines national movements, technological and aesthetic innovations, important figures, and significant films. Includes films, lectures, and discussions. *Prereq.* One prior course in art history is recommended.

ART U336 American Film 4 SH
Surveys the rise of American film from the late nineteenth century to the present. Examines key films, directors, major themes, and film forms and techniques. Includes lectures, screenings, and discussions. *Prereq.* One prior course in art history is recommended.

ART U337 Contemporary Directions in Cinema 4 SH
Provides a comparative study of major international film movements from 1960 to the present. Studies selected films by representative contemporary directors. Includes lectures, screenings, and discussions. *Prereq.* One prior course in art history is recommended.

ART U344 Typography 2 4 SH
Continues ART U334. Shifts the focus from the letterform to text type in a series of projects and exercises that introduce students to generating and manipulating typography on computers. Assignments increase in typographic complexity, bringing into play issues of structure, hierarchy, legibility, and readability in a variety of applications and formats. Investigates publication and periodical design issues including concept development, sequence, organization, page design, typography, and the typographic grid. Includes assignments using page layout software in the computer labs. *Prereq.* ART U290 and ART U334.

ART U350 Color in Multiple Media 4 SH
Focuses on the optical phenomena of color and their application in visual communication. Studies hue, value, and saturation, and their implications for color activity, legibility, and spatial illusion in traditional and electronic media. *Prereq.* One prior course in art history is recommended.

ART U354 Figure Drawing 4 SH
Focuses on developing the student's awareness of the structure of the figure as well as the emotive qualities of "figuration." Students draw from a model in each class. They also develop drawings based on the political and social concerns of contemporary culture and the role of gender as seen through "image." *Prereq.* ART U124, ART U130, and ART U131.

ART U360 Photography 2 4 SH
Continues ART U160. Covers film speed testing, fiber-based printing, alternative films in black-and-white and color, analog

toning, duotone and quadtone digital printing, large-scale analog, and digital printing. Uses 120-millimeter cameras and high-end digital capture. *Prereq.* ART U160.

ART U375 Animation Studio 2 4 SH
Continues ART U275. Focuses on seamless integration of animated three-dimensional models with digital photographic backgrounds. Continued emphasis on building comprehensive modeling, surfacing, and animation skills. Students develop original content based on course objectives. Complex systems for creating realistic movement are introduced. Exposes students to compositing and animation processes through lectures, demonstrations, and hands-on assignments. *Prereq.* ART U275.

ART U381 Video Project 4 SH
Offers in-depth exploration of the video medium. Students research, write, and produce a documentary, fictional narrative, or experimental video project. Emphasizes innovation, personal authorship, effective research, sound conceptual development, formal and technical skills, and imaginative and creative soundtracks and visuals in video. *Prereq.* ART U180 or equivalent.

ART U385 Still Digital Imaging 4 SH
Offers a project-based course for majors/minors only and covers all aspects of digital capture, image management, and outputting. There is extensive use of the program's digital equipment and a final project for successful completion of the course. *Prereq.* ART U160 and ART U290.

ART U443 Graphic Design 2 4 SH
Investigates the range of conceptual possibilities inherent in the merging of words/text with images/symbols through the understanding of how their relationship can enhance meaning and comprehension. Explores visual poetry, choices in mark and form, and applied semiotics through projects, readings, and lectures/discussions. *Prereq.* ART U333, ART U344, and ART U350.

ART U475 Animation Studio 3 4 SH
Continues ART U375. Focuses on building comprehensive modeling, animation, and compositing skills in this advanced studio course. Students explore creating special effects through seamless mixture of computer-generated imagery and digital video footage. Advanced compositing and lighting techniques are introduced and explored. Students create original characters using organic modeling and surfacing techniques. Exposes students to animation and compositing processes through lectures, demonstrations, and hands-on assignments. *Prereq.* ART U375.

ART U477, ART U478, ART U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

- ART U500 Arts of the African Diaspora 4 SH
Traces the historical development of the art forms and production practices of the African Diaspora, from traditional to contemporary styles in Africa, the Americas, and elsewhere in the African Diaspora. Emphasizes the study of art objects, the historical and social context in which aesthetic issues are shaped, and the impact of religion and external forces on creativity. Uses lectures, critiques, discussions, fieldwork, and hands-on interaction with art objects. *Prereq.* 64 SH toward degree or junior or senior standing.
- ART U512 Topics in the History of Art 4 SH
Offers in-depth exploration of a specialized theme within the history of art. For upper-level students in the visual arts. *Prereq.* Permission of instructor.
- ART U514 Topics in Contemporary Art 4 SH
Explores a selected group of current themes in the visual arts. Topics may range from postgender artistic practice, contemporary installation and time-based media, or the new discourse on beauty to digital media, ethnic and regional identities in the visual arts, and the problem of high art in the era of mass culture. Emphasis is on firsthand experience of contemporary art in galleries, museums, and alternative venues and on the writings of contemporary critics. *Prereq.* ART U103, ART U313, and permission of instructor.
- ART U575 Animation Studio 4 4 SH
Continues ART U475. Serves as preparation for a career as a professional animator in this advanced studio course. Centers on student-generated projects that result in either a completed short video piece suitable for submission to animation festivals and/or in a video portfolio reel suitable for submission to potential employers. Structure is based on weekly goals that are determined by aesthetic and technical demands of student proposals. *Prereq.* ART U475.
- ART U601 Alternative Analog and Digital Processes 4 SH
Explores, demonstrates, and uses nineteenth-, twentieth-, and twenty-first-century photographic processes to explore alternative delivery systems for creative and professional applications. Both analog and digital domains are used and cross-referenced. *Prereq.* ART U385; for photography concentrators and multimedia majors only.
- ART U602 Fine Art Digital Imaging 4 SH
Explores and allows higher-level application of digital tools including mural printing, personal Web page construction, conceptually based installations, and nonstandard delivery of visual imagery. The course is project based. A final presentation is required for completion of the course. *Prereq.* ART U601; for photography concentrators and multimedia majors only.
- ART U630 Degree Project in Design 4 SH
Presents an advanced seminar in the area of information design whose development sequence mirrors that of complex professional design projects. Extends a single applied project theme in phases through an entire semester. Central to the course is a substantive written problem definition and program development integrating academic and applied design experience. Fulfills the Arts and Sciences experiential education requirement. *Prereq.* ART U344, ART U635, and ART U644.
- ART U635 Time-Based Design 4 SH
Introduces time-based sequencing and characteristics of motion and transformation (such as anticipation, interval, succession, tempo, pacing, silence, and change) through a series of analog and digital projects. Initial short projects explore the potential of type in motion. Subsequent projects increase in length and complexity incorporating image and sound. Concepts from film, animation, and music are incorporated in classroom discussions. Film titles, motion graphics, and other related time-based arts are explored through assignments, lectures, and student presentations. *Prereq.* ART U180, ART U290, ART U333, and ART U344.
- ART U644 Interactive Design 4 SH
Introduces fundamental principles of screen-based interactive design. Emphasis is on basic principles such as idea mapping and storyboarding; content and relationship structuring; and an understanding of the impact on nonlinear and user-driven narratives. Hierarchy, composition, typography, and visual metaphors are explored as means to clarify navigation. Short exercises, some involving collaboration efforts, allow exploration of the interactive medium. A longer and less constrained individual project requiring research and problem-solving methodologies introduces the complexities of creating an interactive information structure. *Prereq.* ART U333, ART U344, and ART U350.
- ART U677, ART U678, ART U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.
- ART U685 Interarts 4 SH
Introduces nontraditional art concepts in an intensive studio course. Includes categories of performance art, installation art, electronic art, multimedia, and kinetic art. Using their own frames of reference and experience, students contribute to a collaborative project and are responsible for keeping a journal that helps them formulate their ideas. Students reflect upon their co-op, internships, and other art-related experiences in a written essay that accompanies their final product. Fulfills the Arts and Sciences experiential education requirement. *Prereq.* Junior or senior standing.
- ART U691 Information Architecture 4 SH
Builds on the visual and technical experience of ART U290 in a sequence of applied projects integrating word and image. Emphasizes imaginative and effective use of digital input and output devices, in conjunction with conventional media, to develop unexpected visual language. Portions of weekly classes are conducted as collaborative workshops and supported by

labs, with students encouraged to interact with one another to enhance technical, problem-solving, and critiquing skills. *Prereq. ART U344 and ART U443.*

ART U699 Advanced Television Production 4 SH
Provides students with guidance in the development of special projects in television and video production. Topics include advanced directing (studio and field), lighting, scriptwriting, editing, graphics, and postproduction technology. *Prereq. Permission of instructor.*

ART U700 Thesis 4 SH
Focuses on the production of a twenty- to thirty-page thesis. Students do individual research under the direction of a faculty member on art-historical topics appropriate to their personal and professional interests. Conceived for art majors who are completing the bachelor of arts degree and whose primary interest is in art history. Fulfills the Arts and Sciences experiential education requirement for art/art history. *Prereq. ART U101, 40 SH toward art history degree, and permission of instructor.*

ART U710 Senior Project in Photography 1 6 SH
Intended for photography concentrators and is part one of degree projects. Structured to teach advanced applications and processes and refine evaluative methods in this thesis-level course. Weekly critiques, a thesis plan, outside reviewers, discussions centered on business practices, portfolio preparation and presentation, and Web page format and content help to prepare senior students for the professional practice. *Prereq. For photography concentrators with senior standing only.*

ART U711 Senior Project in Photography 2 6 SH
Continues ART U710. Intended for photography concentrators only and continues the work begun in the previous course. Additional work is also done to integrate and relate the student's work and five-year experience to the concept of finishing with a thesis-based project at the conclusion of the semester. Critics, and evaluations by curators, professionals, and photo editors, are used to aid students in relating to the profession outside academia. A thesis is required for successful completion of the course and the concentration. *Prereq. ART U710; for photography concentrators with senior standing only.*

ART U921 Directed Study 1 SH
ART U922 Directed Study 2 SH
ART U923 Directed Study 3 SH
ART U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

ART U951 Experiential Education Directed Study 4 SH
Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement.

ART U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

ART U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. ART U970 and honors program participation.*

AMERICAN SIGN LANGUAGE

COLLEGE OF ARTS AND SCIENCES

ASL U100 College: An Introduction 1 SH
Intended for freshmen in the College of Arts and Sciences. Introduces freshmen to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

ASL U101 Elementary ASL 1 4 SH
Introduces students to American Sign Language (ASL). Students develop expressive and receptive competence in using ASL to fulfill various social functions (such as introductions, explanations of personal history, and descriptions of simple narratives). Additional topics include the use of signing space and further use of nonmanual components including facial expression and body postures.

ASL U102 Elementary ASL 2 4 SH
Continues ASL U101. Continues development of expressive and receptive competence in using American Sign Language to fulfill various social functions (such as introductions, explanations of personal history, and descriptions of simple narratives). Emphasizes further development of receptive and expressive skills, finger spelling, vocabulary building, grammatical structures; encourages more extensive use of nonmanual behaviors, classifiers, body postures, and signing space. Students are also introduced to regional and ethnic sign variations and political and educational institutions of the Deaf community. *Prereq. ASL U101.*

ASL U150 Deaf People in Society 4 SH
Focuses on Deaf communities as linguistic and cultural minorities. Topics include perspectives on Deaf communities, attitudes toward Deaf people and sign languages, technology and communication, the contributions of Deaf people to society, professional and social organizations of and for Deaf people, Deaf clubs as a locus of Deaf culture, communication issues,

perspectives on legislation affecting the Deaf community, legislative and political concerns of the Deaf community, and the impact of educational options for Deaf children.

ASL U277, ASL U278, ASL U279 1 SH each
Honors Adjunct

Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by University Honors Program. *Prereq.* Honors program participation.

ASL U301 Intermediate ASL 1 4 SH

Continues the student's development of expressive and receptive competence in using American Sign Language to fulfill various communicative functions, such as making and responding to inquiries, constructing and comprehending narratives, and engaging in debates. Students also continue to expand their ASL lexicon. *Prereq.* ASL U102 or permission of the department.

ASL U302 Intermediate ASL 2 4 SH

Continues ASL U301. Emphasizes further development of receptive and expressive skills, finger spelling, vocabulary building, grammatical structures; encourages more extensive use of nonmanual behaviors, classifiers, body postures, and signing space. Continues exposure to regional and ethnic sign variations and political and educational institutions of Deaf people. Offers intensive practice involving expressive and receptive skills in storytelling and dialogue. Introduces language forms used in American Sign Language poetry and the features of culture as they are displayed in art. *Prereq.* ASL U301 or permission of the department.

ASL U350 Deaf History and Culture 4 SH

Surveys the history and culture of the American Deaf community and Deaf people in the Western world. Focuses on educational, political, and technological forces and events that have positively and negatively affected the American Deaf community. Focuses on the American Deaf community as a linguistic and cultural minority. Also examines contemporary values and factors that shape and define the American Deaf community and compares and contrasts American Deaf cultural values with those of American society in general.

ASL U460 ASL Linguistics 4 SH

Introduces the basic issues in linguistics by examining the structural properties of American Sign Language and comparing it with other languages having similar properties. Includes phonology (formational properties of signs); morphology (word formation, rules, derivation, inflection, complex verbs, classifiers, and verb modulations); semantics (the meaning structure of signs); and syntax (the structure of ASL utterances in terms of old vs. new information and the structure of ASL narratives). *Prereq.* LIN U150 or ENG U150.

ASL U477, ASL U478, ASL U479 1 SH each
Honors Adjunct

Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by University Honors Program. *Prereq.* Honors program participation.

ASL U501 Advanced ASL 1 2 SH

Focuses on continued development of syntactic competence in American Sign Language with particular attention to the use of ASL in formal discourse. Also focuses on lexical semantics and semantic equivalents for multiple meaning English lexical items. *Prereq.* ASL U302.

ASL U502 Advanced ASL 2 2 SH

Continues ASL U501. Focuses on further development and refinement of American Sign Language competence in various discourse settings, predominantly formal and consultative. Continues development of lexical semantics and uses individual diagnostic assessment of ASL competence to determine individual competency goals. *Prereq.* ASL U501.

ASL U510 Interpreting Inquiry Texts 4 SH

Presents theoretical models of interpretation, but the primary focus is the interpretation of inquiry texts (job interviews, case histories, and applications) and the development of strategic decision-making skills within the context of dedicated and embedded inquiry texts. Presents an overview of linguistic and sociolinguistic factors, facets, and aspects of inquiry texts, and then seeks to develop in students the cognitive processes and skills involved in translation, consecutive interpretation, and simultaneous interpretation. The goal is that students develop the cognitive processes and decision-making skills needed to apply these differing strategies for achieving cross-cultural mediation. *Prereq.* ASL U302 or permission of the department.

ASL U515 Interpreting Narrative Texts 4 SH

Focuses on the interpretation of narrative texts (personal narratives, storytelling) and the development of strategic decision-making skills within the context of dedicated and embedded narrative texts. Presents an overview of linguistic and sociolinguistic factors, facets, and aspects of narrative texts, and then seeks to develop in students the cognitive processes and skills involved in translation, consecutive interpretation, and simultaneous interpretation. The goal is that students develop the cognitive processes and decision-making skills needed to apply these differing strategies for achieving cross-cultural mediation. *Prereq.* ASL U510.

ASL U550 The Interpreting Profession 2 SH

Presents an overview of the interpreting profession: responsibilities, ethics, and aptitudes of interpreters; professional associations; law and business of interpreting; the bilingual and bicultural context; basic translation and interpretation; environment and audience; special populations; freelance vs. in-house positions; and evaluation and certification. *Prereq.* ASL U302 or permission of the department.

- ASL U560 ASL-English Contrastive Analysis 4 SH
Examines and contrasts the major linguistic features of American Sign Language and English. Systematically analyzes the two languages using the analytic and descriptive tools of linguistics to examine various dimensions of the languages such as phonology, morphology, and syntax. Also seeks to develop in students an ability to use the analytic and contrastive tools of linguistics as an aid in understanding novel linguistic constructions in each language. *Prereq. ASL U460 and ASL U510 or permission of the department.*
- ASL U610 Interpreting Expository Texts 4 SH
Focuses on the interpretation of expository texts (lectures, procedural texts) and the development of strategic decision-making skills within the context of dedicated and embedded expository texts. Presents an overview of linguistic and sociolinguistic factors, facets, and aspects of expository texts, and then seeks to develop in students the cognitive processes and skills involved in translation, consecutive interpretation, and simultaneous interpretation. The goal is that students develop the cognitive processes and decision-making skills needed to apply these differing strategies for achieving cross-cultural mediation. *Prereq. ASL U515.*
- ASL U615 Interpreting Persuasive Texts 4 SH
Focuses on the interpretation of persuasive texts (solicitation, political speeches) and the development of strategic decision-making skills within the context of dedicated and embedded persuasive texts. Presents an overview of linguistic and sociolinguistic factors, facets, and aspects of persuasive texts, and then seeks to develop in students the cognitive processes and skills involved in translation, consecutive interpretation, and simultaneous interpretation. The goal is that students develop the cognitive processes and decision-making skills needed to apply these differing strategies for achieving cross-cultural mediation. *Prereq. ASL U610.*
- ASL U650 Ethical Decision Making 4 SH
Explores ethical standards and dilemmas in American Sign Language–English interpreting and other professions through discussions, hypothetical situations, and role-playing. Topics include culturally objective standards, ethics and professional principles, power relations within groups, and the Registry of Interpreters for the Deaf (RID) code of ethics. Students examine various alternatives to a duty-based approach to the RID code and draw upon ethical fieldwork experience to analyze the principles that guide ethical decision making among professional interpreters. *Coreq. ASL U651. Prereq. ASL U515.*
- ASL U651 Ethical Fieldwork 2 SH
Comprises the fieldwork component of ASL 650. Students are placed in practical interpreting experiences in educational settings, agencies serving Deaf people, and with freelance interpreters. Focuses on ethical questions and dilemmas and decision making in a biweekly seminar format. Students are required to maintain a log and participate in online discussions. Fulfills the experiential education requirement for ASL majors. *Coreq. ASL U650. Prereq. ASL U515.*
- ASL U677, ASL U678, ASL U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- ASL U921 Directed Study 1 SH
ASL U922 Directed Study 2 SH
ASL U923 Directed Study 3 SH
ASL U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*
- ASL U931 Independent Study 1 SH
ASL U932 Independent Study 2 SH
ASL U933 Independent Study 3 SH
ASL U934 Independent Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*
- ASL U950 Interpreting Practicum 4 SH
Places students in practical interpreting experiences in educational settings, agencies serving Deaf people, and with freelance interpreters. Students are required to record a set number of hours interpreting with supervision and analyzing their work with the supervising interpreter. Students maintain a log and participate in online discussions. Students present case studies drawn from their supervised work experience in biweekly seminars. Fulfills the experiential education requirement for ASL majors. *Prereq. ASL U651.*
- ASL U960 Interpreting Research Practicum 4 SH
Requires students to undertake a research project focused on some aspect of American Sign Language–English interpretation. Students work in research teams (with approval) and may begin their research project once enrolled in ASL U510. In consultation with a faculty adviser, students select a research question, design and implement the data collection component of the project, analyze results, and write up their research findings. In addition to a written report, students also present their research results to ASL majors at an annual “in-house” ASL research symposium. *Prereq. ASL U651.*
- ASL U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student’s major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

ASL U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq.* ASL U970 and honors program participation.

ATHLETIC TRAINING

BOUVÉ COLLEGE OF HEALTH SCIENCES

ATP U105 Athletic Health-Care Overview 3 SH
 Introduces students to the athletic training profession. Identifies the role of athletic health care and of athletic trainers in the health-care system. Introduces the methodology and nomenclature used in professional practice and establishes the moral and ethical foundation of practice. Students are introduced to patient interviews and medical notation in health care. Also presents the role of cooperative education in the major.

ATP U120 Clinical Practice Skills in Athletic Training 3 SH
 Describes the immediate care of acute injuries including wounds, fractures, dislocation, and neurovascular, cardiovascular, and spinal trauma. The concept of universal precautions and OSHA standards is presented with the knowledge and skills required to identify risk factors of injury and illness in a physically active population. The principles used in creating risk management and injury prevention programs are also described. Includes CPR and first aid certification. *Coreq.* ATP U121. *Prereq.* ATP U105.

ATP U121 Lab for ATP U120 1 SH
 Accompanies ATP U120. Lab activities designed to cover clinical proficiencies related to risk management, injury prevention, and acute injuries including wounds, fractures, dislocation, and neurovascular, cardiovascular, and spinal trauma. Lab includes CPR and first aid certification. *Coreq.* ATP U120.

ATP U277, ATP U278, ATP U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

ATP U310 Therapeutic Modalities 3 SH
 Introduces the role of therapeutic agents in the rehabilitation process. Thermal, electrical, and mechanical devices are described, with emphasis on the indications, contraindications, and precautions for the use of specific modalities. *Coreq.* ATP U311. *Prereq.* ATP U105.

ATP U311 Lab for ATP U310 1 SH
 Accompanies ATP U310. Covers clinical proficiencies related to therapeutic agents in the rehabilitation process. *Coreq.* ATP U310.

ATP U320 Therapeutic Exercise 3 SH
 Describes the role of therapeutic exercise programs in the rehabilitation process. General physical assessment and rehabilitation techniques including goniometry, MMT, ROM, strengthening, and PNF are introduced. *Coreq.* ATP U321. *Prereq.* ATP U120.

ATP U321 Lab for ATP U320 1 SH
 Accompanies ATP U320. Covers clinical proficiencies related to therapeutic exercise programs in the rehabilitation process. *Coreq.* ATP U320.

ATP U330 Neuromuscular and Cardiovascular Programming 2 SH
 Describes the basic concepts and practice of wellness screening and physical conditioning including neuromuscular and cardiovascular conditioning techniques. *Prereq.* Sophomore standing or permission of instructor.

ATP U477, ATP U478, ATP U479 1 SH each
 Honors Adjunct
 Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

ATP U500 Evaluation: Lower Extremity 4 SH
 Describes the evaluation, management, treatment, and rehabilitation of orthopedic and neuromuscular injuries to the lower extremity and the subsequent management and rehabilitation approaches. *Coreq.* ATP U501 and ATP U502. *Prereq.* ATP U310 and ATP U320.

ATP U501 Evaluation: Lower Extremity Skills Lab 1 SH
 Accompanies ATP U500. Covers clinical proficiencies related to the evaluation, management, treatment, and rehabilitation of orthopedic and neuromuscular injuries to the lower extremity in this first of two lab courses. *Coreq.* ATP U500 and ATP U502.

ATP U502 Evaluation: Lower Extremity Anatomy Lab 1 SH
 Accompanies ATP U500. Covers the clinical gross anatomy related to the lower extremity in this second lab course. *Coreq.* ATP U500 and ATP U501.

ATP U510 Evaluation: Upper Extremity 4 SH
 Describes the evaluation, management, treatment, and rehabilitation of orthopedic and neuromuscular injuries to the upper extremity and the subsequent management and rehabilitation approaches. *Coreq.* ATP U511 and ATP U512. *Prereq.* ATP U310 and ATP U320.

ATP U511 Evaluation: Upper Extremity Skills Lab 1 SH
 Accompanies ATP U510. Covers clinical proficiencies related to the evaluation, management, treatment, and rehabilitation of orthopedic and neuromuscular injuries to the upper extremity in this first of two lab courses. *Coreq.* ATP U510 and ATP U512.

ATP U512 Evaluation: Upper Extremity Anatomy Lab Accompanies ATP U510. Covers the clinical gross anatomy related to the upper extremity in this second lab course. <i>Coreq. ATP U510 and ATP U511.</i>	1 SH	ATP U941 Athletic Training Clinical Affiliation 1 Introduces students to the athletic training clinical environment under the direct supervision of a licensed athletic trainer. Focuses on the setup and application of therapeutic modalities, therapeutic exercise programs, emergency procedures, and basic injury management. <i>Coreq. ATP U310 and ATP U320. Prereq. ATP U105, ATP U120, clinical clearance, and approval of the clinical coordinator.</i>	3 SH
ATP U520 Evaluation: Head and Spine Describes the evaluation, management, treatment, and rehabilitation of orthopedic and neuromuscular injuries to the head and spine and the subsequent management and rehabilitation approaches. <i>Coreq. ATP U521 and ATP U522. Prereq. ATP U310 and ATP U320.</i>	4 SH	ATP U942 Athletic Training Clinical Affiliation 2 Continues ATP U941. Covers the relevant athletic training clinical proficiencies in a manner that is consistent with the student's cognitive and psychomotor development. <i>Prereq. ATP U941, clinical clearance, and approval of the clinical coordinator.</i>	3 SH
ATP U521 Evaluation: Head and Spine Skills Lab Accompanies ATP U520. Focuses on lab activities that cover clinical proficiencies related to the evaluation, management, treatment, and rehabilitation of orthopedic and neuromuscular injuries to the head and spine. <i>Coreq. ATP U520 and ATP U522.</i>	1 SH	ATP U943 Athletic Training Clinical Affiliation 3 Continues ATP U942. Covers the relevant athletic training clinical proficiencies in a manner that is consistent with the student's cognitive and psychomotor development. <i>Prereq. ATP U942, clinical clearance, and approval of the clinical coordinator.</i>	3 SH
ATP U522 Evaluation: Head and Spine Anatomy Lab Accompanies ATP U520. Focuses on lab activities that cover the clinical gross anatomy related to the head and spine. <i>Coreq. ATP U520 and ATP U521.</i>	1 SH	ATP U944 Athletic Training Clinical Affiliation 4 Continues ATP U943. Covers the relevant athletic training clinical proficiencies in a manner that is consistent with the student's cognitive and psychomotor development. <i>Prereq. ATP U943, clinical clearance, and approval of the clinical coordinator.</i>	3 SH
ATP U530 Disease and Disabilities in Athletics Presents the signs and symptoms of general medical conditions and, if applicable, their limitations on physical activity. <i>Coreq. ATP U531. Prereq. ATP U522 and permission of instructor if not taken concurrently with ATP U520.</i>	3 SH	ATP U946 Athletic Training Senior Experience Offers the opportunity for students to integrate and apply classroom and laboratory knowledge with cooperative education experience in a capstone experience that may be clinically or research oriented. <i>Prereq. ATP U944, clinical clearance, and approval of the clinical coordinator.</i>	2 SH
ATP U531 Lab for ATP U530 Accompanies ATP U530. Covers various clinical proficiencies related to the evaluation, management, treatment, and rehabilitation of diseases and general medical conditions. <i>Coreq. ATP U530.</i>	1 SH	ATP U970 Junior/Senior Project 1 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i>	4 SH
ATP U600 Administration in Athletic Health Care Details the organizational and administrative facets required to manage an athletic health-care organization effectively. Legal, moral, and ethical issues are also discussed. <i>Prereq. Senior standing in the athletic training program.</i>	4 SH	ATP U971 Junior/Senior Project 2 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. ATP U970 and honors program participation.</i>	4 SH
ATP U677, ATP U678, ATP U679 Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each		
ATP U921 Directed Study	1 SH		
ATP U922 Directed Study	2 SH		
ATP U923 Directed Study	3 SH		
ATP U924 Directed Study	4 SH		
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i>			

HEALTH SCIENCES

BOUVÉ COLLEGE OF HEALTH SCIENCES

BHS U100 College: An Introduction 1 SH

Provides an introduction to the University resources, academic programs in the health sciences, and technology and learning. Group activities and individual assignments help students adjust to life on an urban campus, develop a better understanding of the learning process, acquire essential academic skills, and make connections with faculty and students in the college. Enhances students' understanding of self and the decisions they make academically, socially, and spiritually as members of the University's diverse, multicultural community. *Prereq. Freshman standing in College of Health Sciences.*

BHS U105 Nutrition 4 SH

Explores the fundamental role of nutrition in promoting health and introduces the use of two different diet assessment tools to assist individuals in selecting food for health promotion. Explores the nutrient composition and purposes of the food pyramid guide. Covers the physiological functions of energy-providing nutrients in the body and interrelationships.

BHS U250 The American Health-Care System 3 SH

Introduces students to the health-care system in the role of consumers. Basic elements of health care, including financing, personal insurance, high-risk status, and patient's rights are explored within the context of the U.S. system. Central to this exploration is an analysis of health-care issues requiring informed consent from patients, including patient's bill of rights, health-care directives, and the use of a proxy for decision making. The role and responsibilities of various health-care workers are introduced within the framework of an interdisciplinary model of health care.

BHS U300 Communication Skills for the Health Professions 4 SH

Designed to teach students in the health professions to communicate effectively with their patients, colleagues, and other professionals. Covers interpersonal communication with patients and their families, as well as public speaking and presentations, and communicating as a leader. Students are required to make several presentations throughout the semester.

BHS U301 Early Intervention 4 SH

Introduces students to the field of early intervention. Covers the principles of early intervention including the interdisciplinary nature of the services to infants and toddlers with disabilities, and their families, and the team formats in which services are provided. Students are also introduced to the Massachusetts EI (early intervention) standards, eligibility criteria, and the legislation that underlies EI services. Using a case-based approach, with role-play, explores some aspects of the developmental approach to assessment and intervention. Open to all students in Bouvé College of Health Sciences, and is taught by a number of faculty from different disciplines on the early intervention team. *Prereq. Sophomore standing or above.*

BHS U302 Alternative Medicine 4 SH

Presents an objective discussion of the principles of alternative and complementary medicine. Emphasis is on the theory, treatment, and effectiveness of alternative medicine and its role in modern health care. Also presents the theories of homeopathy and Chinese medicine. Possible physiological and biochemical explanations of the beneficial effects of alternative methods are discussed. *Prereq. Sophomore standing or above.*

BHS U450 Health-Care Research 4 SH

Provides an overview of the research process and its application in clinical arenas. Special attention is directed to the role of the health professional as a consumer of research, with concern for the ethical management and treatment of patients and their families. Elements of research design and their implications in clinical settings provide the framework for the analysis of research and the development of a research proposal. Emphasis is placed on the use of research findings for evidence-based practice. Interdisciplinary projects are strongly encouraged. *Prereq. MTH U285 and statistics or equivalent math course.*

BHS U510 Health-Care Ethics 3 SH

Provides students with the opportunity to explore complex ethical issues that arise in clinical practice in the health professions. Particular attention is directed at the concepts of "do no harm," quality of life, and conflict resolution. Patients' rights and the protection of their confidentiality, privacy, and personal prerogatives are central to the course. Established legal cases are explored to assess the presence of ethical considerations. The role of the health professional in fostering a patient's autonomy and implementing his/her own domain of professional responsibility is explored. *Prereq. Junior or senior standing or permission of instructor.*

BHS U515 Health Policy 3 SH

Involves the development and implementation of health policy in the United States and the implications of these for health care. Specific health policies are examined to assess the process of their development, the contributions they have made to the health of the country, and their current status. Other dimensions of health-care policy are investigated to assess impediments to health policy or continuing problems. *Prereq. Permission of instructor.*

BIOLOGY

COLLEGE OF ARTS AND SCIENCES

BIO U100 College: An Introduction 1 SH

Introduces first-year students in biology and biochemistry to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

BIO U101 Principles of Biology 1 Focuses on the basic architecture of cells, cellular organelles, and their molecular components; information and heredity; and mechanisms of evolution. <i>Coreq. BIO U102.</i>	4 SH	BIO U119 Integrated Anatomy and Physiology 2 Continues BIO U117. Presents the structure and function of the human endocrine, reproductive, cardiovascular, respiratory, urinary, and digestive systems as well as the regulation of metabolism and body temperature. <i>Coreq. BIO U120. Prereq. BIO U117.</i>	4 SH
BIO U102 Lab for BIO U101 Accompanies BIO U101. Covers topics from the course through various experiments. <i>Coreq. BIO U101.</i>	1 SH	BIO U120 Lab for BIO U119 Accompanies BIO U119. Covers topics from the course through various experiments. <i>Coreq. BIO U119.</i>	1 SH
BIO U103 Principles of Biology 2 Continues BIO U101. Focuses on the evolution of structural and functional diversity of organisms; the integrative biology of multicellular organisms; and ecological relationships at the population, community, and ecosystem levels. <i>Coreq. BIO U104. Prereq. BIO U101.</i>	4 SH	BIO U121 Basic Microbiology Focuses on how to identify, control, and live with bacteria and viruses. Emphasizes the mechanisms of disease production, natural host defense systems, and medical interventions. <i>Coreq. BIO U122.</i>	4 SH
BIO U104 Lab for BIO U103 Accompanies BIO U103. Covers topics from the course through various experiments. <i>Coreq. BIO U103.</i>	1 SH	BIO U122 Lab for BIO U121 Accompanies BIO U121. Covers topics from the course through various experiments. <i>Coreq. BIO U121.</i>	1 SH
BIO U106 Introduction to Experiential Education Provides students with information about the cooperative education program, the experiential education requirement, and other experiential opportunities. Students work in small groups to practice résumé writing and interview skills.	1 SH	BIO U141 Microbes and Society Introduces the unseen world of microorganisms. Students analyze how the growth and behavior of this diverse group of organisms affect many aspects of human society, including agriculture and food preparation; drug development and manufacture; liquid and solid waste management; genetic engineering; geochemical cycles; and health and disease.	4 SH
BIO U111 General Biology 1 Examines the basic architecture of cells, cellular organelles, and their molecular components; information and heredity; and the mechanisms of evolution. <i>Coreq. BIO U112.</i>	4 SH	BIO U143 Biology and Society Examines developments in biology that impact personal decisions and civil politics. Is taught from the historical perspective with an eye toward the future. Provides students with the opportunity to acquire critical investigative tools with which to analyze current social and political issues in biology.	4 SH
BIO U112 Lab for BIO U111 Accompanies BIO U111. Covers topics from the course through various experiments. <i>Coreq. BIO U111.</i>	1 SH	BIO U145 Environment and Humankind Offers an ecological analysis of human interaction with other organisms. Presents the necessary foundation of biological principles.	4 SH
BIO U113 General Biology 2 Continues BIO U111. Examines the evolution of structural and functional diversity of organisms; the integrative biology of multicellular organisms; and ecological relationships at the population, community, and ecosystem levels. <i>Coreq. BIO U114. Prereq. BIO U111.</i>	4 SH	BIO U147 The Human Organism Introduces the structure and function of the human body. Emphasizes the principles of biological and physical science as they relate to life processes in health and disease.	4 SH
BIO U114 Lab for BIO U113 Accompanies BIO U113. Covers topics from the course through various experiments. <i>Coreq. BIO U113.</i>	1 SH	BIO U149 Biology of Human Reproduction Studies sexual and reproductive function in the human male and female, that is, sexual development, coitus, fertilization, pregnancy, birth, and lactation. Discusses the methods of controlling fertility and sexually transmitted diseases. Analyzes factors affecting reproduction and sexuality in human population.	4 SH
BIO U117 Integrated Anatomy and Physiology 1 Introduces students to integrated human anatomy and physiology. Focuses on structure and function of cells and tissues. Presents the anatomy and physiology of skin, bones, muscles, blood, and the nervous system. <i>Coreq. BIO U118.</i>	4 SH	BIO U151 Introduction to Marine Biology Presents the major physical, chemical, and geological properties of the ocean. Focuses on life in the marine environment as well as the structure and function of marine ecosystems.	4 SH
BIO U118 Lab for BIO U117 Accompanies BIO U117. Covers topics from the course through various experiments. <i>Coreq. BIO U117.</i>	1 SH		

Includes the study of human interactions with the sea such as the acquisition of marine resources, human impacts, and marine biotechnology.

BIO U277, BIO U278, BIO U279 1 SH each
Honors Adjunct

Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

BIO U301 Genetics and Molecular Biology 4 SH

Focuses on mechanisms of inheritance, gene-genome structure and function, and developmental genetics and evolution. Examples are drawn from the broad spectrum of plants, animals, fungi, bacteria, and viruses. Topics and analytical approaches include transmission genetics, molecular biology and gene regulation, DNA molecular methods, quantitative and population genetics, bioinformatics, genomics, and proteomics. *Coreq. BIO U302. Prereq. BIO U101 and BIO U103.*

BIO U302 Lab for BIO U301 1 SH

Accompanies BIO U301. Covers topics from the course through various experiments. *Coreq. BIO U301.*

BIO U303 Human Anatomy and Physiology 1 4 SH

Provides an in-depth examination of the structure, function, and regulation of the cells, tissues, and organs involved in major human physiological systems. Discusses the anatomy and physiology of skin, bones, muscles, blood, and the nervous system. *Coreq. BIO U304. Prereq. BIO U113.*

BIO U304 Lab for BIO U303 1 SH

Accompanies BIO U303. Covers topics from the course through various experiments. *Coreq. BIO U303.*

BIO U305 Human Anatomy and Physiology 2 4 SH

Continues BIO U303. Provides an in-depth examination of the structure, function, and regulation of the human endocrine, reproductive, cardiovascular, respiratory, urinary, and digestive systems. Also discusses mechanisms for metabolic and thermal regulation. *Coreq. BIO U306. Prereq. BIO U303.*

BIO U306 Lab for BIO U305 1 SH

Accompanies BIO U305. Covers topics from the course through various experiments. *Coreq. BIO U305.*

BIO U311 Ecology 4 SH

Considers physical and chemical factors of the environment as they affect the distribution of organisms and as they may in turn be affected by the organisms. Includes population dynamics, species interactions, population genetics (briefly), the development of communities, and the structure and function of ecosystems. *Coreq. BIO U312. Prereq. BIO U301 and CHM U213.*

BIO U312 Lab for BIO U311 1 SH

Accompanies BIO U311. Covers topics from the course through various experiments. *Coreq. BIO U311.*

BIO U313 Plant Biology 4 SH

Examines the biology and diversity of plants and plant-like organisms. Explores the relationships between humans and plants by looking at plants through three different perspectives: feeding a starving world; curing a sick world; and engineering a better world. Employs case studies to highlight major themes. *Coreq. BIO U314. Prereq. BIO U301.*

BIO U314 Lab for BIO U313 1 SH

Accompanies BIO U313. Covers topics from the course through various experiments. *Coreq. BIO U313.*

BIO U315 Invertebrate Zoology 4 SH

Explores functional morphology, systematics, ecology, and phylogenetic relationships of the major invertebrate phyla. *Coreq. BIO U316. Prereq. BIO U301.*

BIO U316 Lab for BIO U315 1 SH

Accompanies BIO U315. Covers topics from the course through various experiments. *Coreq. BIO U315.*

BIO U317 Vertebrate Zoology 4 SH

Explores functional morphology, systematics, ecology, and phylogenetic relationships of the major vertebrate phyla. *Coreq. BIO U318. Prereq. BIO U301.*

BIO U318 Lab for BIO U317 1 SH

Accompanies BIO U317. Covers topics from the course through various experiments. *Coreq. BIO U317.*

BIO U319 Regulatory Cell Biology 4 SH

Introduces physiological control systems, including transport processes, cellular basis of nerve function, action of chemical messengers and regulators, and principles of cellular contraction and motility. *Coreq. BIO U320. Prereq. BIO U301 and CHM U311.*

BIO U320 Lab for BIO U319 1 SH

Accompanies BIO U319. Covers topics from the course through various experiments. *Coreq. BIO U319.*

BIO U321 Microbiology 4 SH

Introduces morphological, ecological, and biochemical consideration of representative groups of bacteria. Introduces virology and microbial genetics; host-parasite relationships, prokaryotes of medical significance; and physical and chemical controls of microbial growth. *Coreq. BIO U322. Prereq. BIO U301.*

BIO U322 Lab for BIO U321 1 SH

Accompanies BIO U321. Covers topics from the course through various experiments. *Coreq. BIO U321.*

BIO U323 Biochemistry	4 SH	BIO U502 Lab for BIO U501	1 SH
Covers structure and function of biomolecules, central concepts of bioenergetics and thermodynamics, enzyme kinetics and regulation, and metabolic pathways. <i>Coreq. BIO U324. Prereq. BIO U301 and CHM U311.</i>		Accompanies BIO U501. Covers topics from the course through various experiments. <i>Coreq. BIO U501.</i>	
BIO U324 Lab for BIO U323	1 SH	BIO U503 Marine Invertebrate Zoology	4 SH
Accompanies BIO U323. Covers topics from the course through various experiments. <i>Coreq. BIO U323.</i>		Examines the morphology, physiology, life history, systematics, and ecology of marine invertebrates at the phylum and class level, via the comparative approach. Laboratories emphasize functional morphology and identification (East/West Marine Biology Program). <i>Coreq. BIO U504. Prereq. BIO U301 and BIO U311.</i>	
BIO U401 Comparative Vertebrate Anatomy	4 SH	BIO U504 Lab for BIO U503	1 SH
Examines the morphology and phylogeny of the vertebrates. <i>Coreq. BIO U402. Prereq. BIO U301.</i>		Accompanies BIO U503. Covers topics from the course through various experiments. <i>Coreq. BIO U503.</i>	
BIO U402 Lab for BIO U401	1 SH	BIO U505 Biology of Corals and Coral Reefs	3 SH
Accompanies BIO U401. Covers topics from the course through various experiments. <i>Coreq. BIO U401.</i>		Focuses on Scleractinian corals as well as the fauna associated with the reefs formed by these cnidarians. Topics include the systematics, anatomy, physiology, and ecology of corals as well as the ecological importance of coral reefs and reef disturbance (both physical and biological) in tropical marine ecosystems (East/West Marine Biology Program). <i>Prereq. BIO U301.</i>	
BIO U403 Animal Behavior	4 SH	BIO U507 Biology and Ecology of Fishes	3 SH
Examines the evolution of animal behavior. Topics include how behaviors have evolved, the adaptive function of behavior, and the relative roles of genes and the environment in the development of behavior. Behaviors from feeding and reproductive strategies to communication and social behavior are considered. Implications for human behavior are considered. <i>Prereq. BIO U103 or PSY U458.</i>		Presents an examination of the systematics, functional morphology, and behavioral, larval, and community ecology of reef fishes. Field and laboratory experiments focus on morphology, behavior, and community ecology of reef fishes (East/West Marine Biology Program). <i>Prereq. BIO U301.</i>	
BIO U405 Neurobiology	4 SH	BIO U509 Marine Birds and Mammals	2 SH
Introduces the cellular and molecular functioning of the nervous system, the organization of neurons into circuits, the processing of information, and the generation of motor output. <i>Prereq. BIO U103 or PSY U458.</i>		Examines principles of classification, anatomy, physiology, behavior, and evolution of seabirds and marine mammals. Conservation and protection of animals and essential habitat is also addressed. Field trips are taken to observe local species (East/West Marine Biology Program). <i>Coreq. BIO U510. Prereq. BIO U301.</i>	
BIO U407 Molecular Cell Biology	4 SH	BIO U510 Lab for BIO U509	1 SH
Integrates molecular biology and biochemistry in the cellular context. Emphasizes the organization and replication of genomes, the regulation of gene expression, the structures and function of organelles, and the mechanisms of signal transduction. <i>Prereq. BIO U323.</i>		Accompanies BIO U509. Covers topics from the course through various experiments. <i>Coreq. BIO U509.</i>	
BIO U409 Current Topics in Biology	4 SH	BIO U511 Adaptations of Aquatic Organisms	3 SH
Examines selected topics in biology. Topics vary each semester. <i>Prereq. BIO U301.</i>		Explores the adaptive responses of marine organisms to variations in environmental factors. Focuses on physiological responses to a variety of natural and anthropogenic conditions. The laboratory component includes a combination of field and laboratory experiments (East/West Marine Biology Program). <i>Prereq. BIO U301 and BIO U311.</i>	
BIO U477, BIO U478, BIO U479	1 SH each	BIO U513 Tropical Terrestrial Ecology	1 SH
Honors Adjunct		Studies the animals, plants, and ecosystems of the New World tropics, with the community structure and diversity of terrestrial Jamaican habitats as an example. Includes field trips to lowland forests, carbonated caves, and the Blue Mountain mist-montane forest. The issue of land use and development vs. conservation is a recurring theme (East/West Marine Biology Program). <i>Prereq. BIO U301.</i>	
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>			
BIO U501 Marine Botany	4 SH		
Focuses on structure, taxonomy, ecology, and evolution of marine plants. Lectures include relationships to other plants, ecological role, and economic importance of marine algae. Field trips to a variety of local habitats (East/West Marine Biology Program). <i>Coreq. BIO U502. Prereq. BIO U301.</i>			

BIO U515 Benthic Marine Ecology	3 SH	BIO U526 Lab for BIO U525	1 SH
Studies the interaction among bottom-dwelling invertebrates, fish, algae, and their environment. Rocky inertial and subtidal zones and tidal flat habitats are studied. Emphasis is on quantitative field methods, new developments in ecological theory, and recent research (East/West Marine Biology Program). <i>Prereq. BIO U301.</i>		Accompanies BIO U525. Covers topics from the course through various experiments. <i>Coreq. BIO U525.</i>	
BIO U517 Oceanography	2 SH	BIO U545 Neuroethology	4 SH
Examines processes important to coastal ocean ecosystems by presenting biological, chemical, and physical concepts. The productivity of coastal oceans, biogeochemical cycling, and atmosphere-ocean interactions are examined (East/West Marine Biology Program). <i>Coreq. BIO U518. Prereq. BIO U301.</i>		Concentrates on the mechanisms underlying behavior of model invertebrates and lower vertebrates. Aims to develop a framework to explain behavior in terms of properties and connectivity of neuronal circuits. Topics include cellular biology of neurons and neuronal circuits, the organization of sensory and motor systems, and field and lab analysis of simple behaviors. <i>Coreq. BIO U546. Prereq. BIO U301.</i>	
BIO U518 Lab for BIO U517	1 SH	BIO U546 Lab for BIO U545	1 SH
Accompanies BIO U517. Covers topics from the course through various experiments. <i>Coreq. BIO U517.</i>		Accompanies BIO U545. Covers topics from the course through various experiments. <i>Coreq. BIO U545.</i>	
BIO U519 Ocean and Coastal Processes	3 SH	BIO U547 Sociobiology	4 SH
Offers an integrated ecosystem approach to the oceanography, ecology, geology, and paleobiology of coral reefs and reef-associated habitats. Lectures, field trips, and laboratory exercises introduce students to a wide range of tropical shore environments including mangroves, sea grass beds, and fossil Pleistocene and Rudist reefs (East/West Marine Biology Program). <i>Prereq. BIO U301.</i>		Focuses on the biological basis for the evolution of social behavior. Incorporates ethology (animal behavior), ecology, population biology, and evolutionary theory to explain the origins and diversity of social organization in animals. Reviews studies of nonhuman animals that best illustrate evolutionary principles and theories. Information on human behavior is reviewed where applicable and studied within an evolutionary perspective. Through practical and theoretical assignments, provides students an opportunity to research in the areas of ethology and sociobiology, giving them novel tools to interpret the natural world around them in a very different way. <i>Prereq. BIO U301.</i>	
BIO U521 Experimental Design Marine Ecology	4 SH	BIO U549 Microbial Biotechnology	4 SH
Provides the tools necessary for the proper design of ecological experiments and their analysis. Focuses on experimental designs tailored for analysis of variance (ANOVA). Principles of design are illustrated with several short-term experiments (East/West Marine Biology Program). <i>Coreq. BIO U522. Prereq. BIO U301.</i>		Covers genetic and physiological manipulation of microorganisms for the production of metabolites, macromolecules, or cells for use in medicine, agriculture, bioremediation, and industry. <i>Prereq. BIO U323.</i>	
BIO U522 Lab for BIO U521	1 SH	BIO U551 Principles of Animal Physiology	4 SH
Accompanies BIO U521. Covers topics from the course through various experiments. <i>Coreq. BIO U521.</i>		Covers function and regulation of major physiological systems in animals including cellular and organismal energy metabolism; thermoregulation; muscle and movements; circulation; respiration; and salt and water balance. Emphasizes vertebrates including humans, but material on invertebrates is included where appropriate for understanding general principles. <i>Coreq. BIO U552. Prereq. BIO U319 or BIO U323.</i>	
BIO U523 Molecular Marine Biology	3 SH	BIO U552 Lab for BIO U551	1 SH
Studies molecular approaches (electrophoresis and DNA) that are used to determine genetic relationships at the population and species level for the study of ecological and evolutionary questions. Techniques learned are applied to research projects (East/West Marine Biology Program). <i>Prereq. BIO U301.</i>		Accompanies BIO U551. Covers topics from the course through various experiments. <i>Coreq. BIO U551. Prereq. Permission of instructor.</i>	
BIO U525 Marine Microbial Ecology	2 SH	BIO U553 Biology of Muscle: Molecules to Movements	4 SH
Focuses on the fundamental role of microbial communities in the function of the biosphere. Surveys the diversity of microorganisms, their ecological strategies, and interactions in aquatic and soil communities, deep sea vent and subsurface rock environments, extreme conditions of Antarctic ice, and boiling springs (East/West Marine Biology Program). <i>Coreq. BIO U526. Prereq. BIO U301.</i>		Examines the biology of skeletal muscle and movement in an integrated fashion. Considers the biochemical, physiological, and structural properties of skeletal muscle that adapt it to diverse mechanical functions. Examines the structure and	

function of the contractile proteins and their assemblies into sarcomeres. Considers the regulation of these elements through excitation-contraction coupling. The metabolic machinery that supplies the energy for contraction is reviewed, emphasizing the regulatory systems that link energy supply and demand and the overall efficiency of contraction. The architectural contraction of muscle fibers and connective tissue elements to form mechanical linkages to the skeleton is presented. Information is integrated by analyzing the function and performance of skeletal muscle during movement. Locomotor systems considered include swimming, flying, running, and jumping. *Prereq. BIO U551.*

BIO U555 Plant Development 4 SH
Examines the structural and molecular aspects of plant development beginning with the fertilization apparatus of higher plants and the development of the embryonic plant. The structure and development of the vegetative and reproductive organs of the plant are studied, and advances in the fields of cellular and molecular biology are applied to the interpretation of plant development. Students progress from learning fundamental information on each topic through reading contemporary research papers. *Coreq. BIO U556. Prereq. BIO U311.*

BIO U556 Lab for BIO U555 1 SH
Accompanies BIO U555. Covers topics from the course through various experiments. *Coreq. BIO U555.*

BIO U557 Evolution of Vascular Plants 4 SH
Covers the origin and evolution of land plants. The invasion of the land surface by plants, particularly vascular plants, occurred in the late Silurian and early Devonian time, approximately 405 million to 370 million years ago. The flora that covers planet Earth today is vastly different from the flora of those early geological days. Considers the early land plants; how they evolved into the complex land plant flora that we see today; the taxa that have survived unaltered until present day; how the seed-bearing plants develop; and the nature of the complex reproductive structure we call the flower. *Coreq. BIO U558. Prereq. BIO U311 and BIO U313.*

BIO U558 Lab for BIO U557 1 SH
Accompanies BIO U557. Covers topics from the course through various experiments. *Coreq. BIO U557.*

BIO U559 Entomology 4 SH
Studies the biology of insects and related arthropods including their anatomy, morphology, physiology, development, taxonomy, ecology, and life histories. Emphasis is placed on the relation of insects to agriculture and medicine. Includes field and laboratory study of the characteristics, physiology, collection, and preservation of insects. *Coreq. BIO U560. Prereq. BIO U301.*

BIO U560 Lab for BIO U559 1 SH
Accompanies BIO U559. Covers topics from the course through various experiments. *Coreq. BIO U559.*

BIO U561 Herpetology 4 SH
Surveys the amphibians and reptiles of the world, with emphasis on eastern North America. Topics include morphology, physiology, systematics, paleontology, ecology, zoogeography, and behavior. Field trips are taken to observe the habits and behavior of local herpetofauna. Laboratory emphasizes systematics and ecology. *Coreq. BIO U562. Prereq. BIO U311 and BIO U317.*

BIO U562 Lab for BIO U561 1 SH
Accompanies BIO U561. Covers topics from the course through various experiments. *Coreq. BIO U561.*

BIO U563 Ornithology 4 SH
Surveys the birds of the world including morphology, physiology, systematics, behavior, ecology, zoogeography, and paleontology. Laboratory focuses on the identification and ecology of avifauna of the Northeast, with field trips in eastern Massachusetts. *Coreq. BIO U564. Prereq. BIO U311 and BIO U317.*

BIO U564 Lab for BIO U563 1 SH
Accompanies BIO U563. Covers topics from the course through various experiments. *Coreq. BIO U563.*

BIO U565 Mammalogy 4 SH
Surveys the mammals of the world including morphology, physiology, systematics, behavior, ecology, zoogeography, and paleontology. Laboratory focuses on the identification of the mammals of eastern North America and techniques used to study them. There is a three-day field trip to observe mammals and employ techniques. *Coreq. BIO U566. Prereq. BIO U311 and BIO U317.*

BIO U566 Lab for BIO U565 1 SH
Accompanies BIO U565. Covers topics from the course through various experiments. *Coreq. BIO U565.*

BIO U567 Wildlife Biology 4 SH
Presents concepts and techniques utilized in the conservation and study of wild animals including the sociological aspects of management. Topics include habitat management, non-native species, zoonoses, endangered species, legislation, and financing. Extended field trips are taken to observe various ecosystems and wildlife. *Coreq. BIO U568. Prereq. BIO U311 and BIO U561 or BIO U563 or BIO U565.*

BIO U568 Lab for BIO U567 1 SH
Accompanies BIO U567. Covers topics from the course through various experiments. *Coreq. BIO U567.*

BIO U569 Microbial Physiology and Genetics 4 SH
Focuses on how microorganisms develop, exchange and regulate genes, and survive in various environments. Emphasis is placed on experimental design and proof. *Prereq. BIO U321 and BIO U323.*

BIO U571 Microbial Ecology	4 SH	BIO U583 Immunology	4 SH
Focuses on the fundamental role of microbial communities in the function of the biosphere. Surveys the diversity of microorganisms, their ecological strategies, and interactions in aquatic and soil communities, deep sea vent and subsurface rock environments, extreme conditions of Antarctic ice, and boiling springs. <i>Coreq. BIO U572. Prereq. BIO U321.</i>		Provides an overview of the structure and function of genes, proteins, and cells involved in the generation of the immune response. Emphasizes molecular immunology and immunogenetics. <i>Prereq. BIO U407 must be taken prior to, or concurrently with, BIO U583.</i>	
BIO U572 Lab for BIO U571	1 SH	BIO U585 Evolution	4 SH
Accompanies BIO U571. Covers topics from the course through various experiments. <i>Coreq. BIO U571.</i>		Discusses a brief history of evolutionary theory and lines of evidence. Emphasizes mechanisms of speciation. Current evolutionary topics are introduced and discussed. <i>Coreq. BIO U586. Prereq. BIO U301 and BIO U311.</i>	
BIO U573 Medical Microbiology	4 SH	BIO U586 Lab for BIO U585	1 SH
Emphasizes host-parasite interactions including virulence, toxins, natural flora, and immunological responses; characteristics of the common bacterial, rickettsial, and protozoal infections in humans; epidemiology, pathology, vaccines, and chemotherapy. <i>Coreq. BIO U574. Prereq. BIO U321.</i>		Accompanies BIO U585. Students make presentations during laboratory. <i>Coreq. BIO U585.</i>	
BIO U574 Lab for BIO U573	1 SH	BIO U587 Comparative Neurobiology	4 SH
Accompanies BIO U573. Covers topics from the course through various experiments. <i>Coreq. BIO U573.</i>		Presents a cellular approach to structure and function of the nervous system. Topics include neuronal anatomy; phylogeny of nervous systems; electrophysiology of membrane conductances; synaptic transmission; integration in nerve cells; neuronal networks; sensory systems; motor systems; sensory-motor integration, development, and regeneration of neuronal connectivity; and fundamentals of neurotechnology for biomimetics. Focuses on the development of these concepts from the primary research literature. A term project involves the design of a simple nervous system for a hypothetical animal. <i>Prereq. BIO U301 or PSY U458.</i>	
BIO U575 Parasitology	4 SH	BIO U589 Diving Research Methods	2 SH
Examines the symbiotic relationship of parasitic protozoans, flatworms, nematodes, and arthropods. <i>Coreq. BIO U576. Prereq. BIO U301.</i>		Presents experimental design, sampling methodology, statistical analysis techniques, and the use of underwater equipment to conduct subtidal research. <i>Prereq. Scuba certification and a successful completion of a recent physical exam.</i>	
BIO U576 Lab for BIO U575	1 SH	BIO U677, BIO U678, BIO U679	1 SH each
Accompanies BIO U575. Covers topics from the course through various experiments. <i>Coreq. BIO U575.</i>		Honors Adjunct	
BIO U577 Developmental Biology	4 SH	Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	
Focuses on organism development at cellular, molecular, and anatomical levels. Topics include gametogenesis, fertilization, cleavage, gastrulation, organogenesis, and metamorphosis. Invertebrates and vertebrates provide descriptive and experimental models. Laboratory work emphasizes echinoderms, amphibians, birds, and mammals. <i>Coreq. BIO U578. Prereq. BIO U301.</i>		BIO U701 Biology Capstone	4 SH
BIO U578 Lab for BIO U577	1 SH	Integrates and assesses the concepts and skills obtained from the entire biology curriculum including both experiential and classroom-based components. Requires extensive reflection by students on their various educational experiences as well as written summaries of these reflections, library and Internet research of scientific questions related to the experiences, and preparation of presentations of this research (oral, poster, and/or Web site). All phases are accompanied by class discussion and critique. Required for biology majors and can be used to fulfill the experiential education requirement. <i>Prereq. 75 SH and at least one approved experiential activity; that is, 4 SH of laboratory- or field-oriented directed study or at least one co-op. Prereq. Junior or senior standing with experiential education.</i>	
BIO U579 Biochemistry Methods Laboratory	5 SH		
Introduces modern research techniques used in biochemistry and molecular biology. Topics include recombinant DNA, kinetic properties of enzymes, and in vitro mutagenesis. Includes two hours of lecture and seven hours of lab. <i>Prereq. Permission of instructor.</i>			
BIO U581 Biological Imaging	4 SH		
Illustrates imaging principles and techniques and their application to biological problems. Topics vary and may include microscopic and macroscopic approaches in areas such as cellular biology, neurobiology, ecology, and biochemistry. <i>Prereq. BIO U323.</i>			

BIO U921 Directed Study 1 SH
 BIO U922 Directed Study 2 SH
 BIO U923 Directed Study 3 SH
 BIO U924 Directed Study 4 SH
 Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

BIO U954 Experiential Education Directed Study 4 SH
 Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using the course to fulfill their experiential education requirement. *Prereq. Permission of instructor.*

BIO U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

BIO U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. BIO U970 and honors program participation.*

COUNSELING AND APPLIED PSYCHOLOGY

BOUVÉ COLLEGE OF HEALTH SCIENCES

CAP U277, CAP U278, CAP U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

CAP U460 Special Education 4 SH
 Surveys the characteristics and the development and learning needs of children and youth with special needs. Reviews legislation and current trends, with an emphasis on integration and full inclusion of children and youth with special needs in regular education settings and also in the community. Introduces principles of assessment and intervention and strategies for the development of individualized education programs (IEPs). *Prereq. Sophomore standing or above.*

CAP U477, CAP U478, CAP U479 1 SH each
 Honors Adjunct
 Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

CAP U480 Counseling Theories and Practice 4 SH
 Surveys major theoretical approaches to counseling. Provides training and practice in listening skills to aid in the development of facilitative responses. Combines didactic representations and experiential activities to assist in understanding and implementing a variety of counseling approaches. *Prereq. One introductory social science course.*

CAP U485 Mental Health and Counseling 4 SH
 Explores those characteristics that constitute a mentally healthy person, factors in society that impact on emotional health, the mind-body relationship, stress, and ways to achieve a higher level of emotional well-being. Offers students the opportunity to work in triads, small groups, and large group discussions. Role-play is utilized where appropriate. *Prereq. One introductory social science course.*

CAP U502 Health Counseling 3 SH
 Geared toward students who intend to pursue work in the health-care field as counselors, social workers, trainers, therapists, and administrators. After covering health issues in general, which may call for counseling interventions, the course assists students in becoming more willing and able to reach out to others. From a base of self-understanding, students deepen their human capacity to recognize and respond to the emotional dimensions of many health-related situations. Non-ATP students should also register for CAP U503 concurrently. *Prereq. Junior or senior standing.*

CAP U503 Experiencing Health Counseling 1 SH
 Meets in conjunction with CAP U502. Gives students additional experience and opportunities to view and practice health counseling in various scenarios and settings, to role-play, and to discuss topics from within their interests in health or mental health. This course is not required for ATP students. *Prereq. Junior or senior standing.*

CAP U505 Human Sexuality 4 SH
 Designed as an in-depth study of human sexuality for the upper-level University student. Topics address issues that affect the individual and society and include intimate relationships, sexual behaviors and lifestyles, gender roles, and current health issues associated with human sexual behaviors. Format is generally role-play, small group, and self-exploration. *Prereq. 64 SH toward degree or junior or senior standing.*

CAP U510 Etiology and Development of Special Needs 4 SH
 Presents an overview of the etiology and development of disabling conditions and their impacts on infants, children, and youth with special needs. Discusses a variety of biological and environmental risk factors associated with developmental and learning problems. *Prereq. CAP U460.*

CAP U511 Assessment, Program Planning, and Implementation in Special Education 4 SH

Presents the process of assessment, program planning, and implementation for children and youth with special needs. Requires students to administer education assessments, summarize the results in a case report, propose a program of education intervention, and identify methods to facilitate and monitor its implementation, in the context of an individualized education program (IEP). *Prereq.* CAP U460.

CAP U677, CAP U678, CAP U679 Honors Adjunct 1 SH each

Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

CAP U931 Independent Study 1 SH
CAP U932 Independent Study 2 SH
CAP U933 Independent Study 3 SH
CAP U934 Independent Study 4 SH

Offers independent work for advanced undergraduate students under the direction of members of the department on a chosen topic. Limited to full-time undergraduate students. Students must make a proposal for a study plan and have it approved before registering for the course. *Prereq.* Permission of instructor.

CAP U947 Practicum and Seminar in Special Education 4 SH
Allows for full-time participation in a University-arranged and -supervised public or private school placement, emphasizing inclusive settings. Gives the student the opportunity to analyze the teaching of and the learning by students with special needs and to develop, demonstrate, and evaluate effective teaching methods. *Prereq.* CAP U510, CAP U511, and permission of instructor.

CAP U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq.* Honors program participation.

CAP U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq.* CAP U970 and honors program participation.

BUSINESS ADMINISTRATION

COLLEGE OF BUSINESS ADMINISTRATION

CBA U101 Introduction to Business 4 SH

Introduces the basic functions of management through an interdisciplinary case on the business cycle. Students do self-assessments to help them prepare for college and for a career in business. Also covers skills needed to perform well in their classes and career, such as team-building exercises, presentation and communication skills, and conflict resolution, ethics, and leadership skills. *Prereq.* CBA students only.

CARDIOPULMONARY AND EXERCISE SCIENCES

BOUVÉ COLLEGE OF HEALTH SCIENCES

CES G200 Cardiopulmonary Physiology 3 SH

Covers advanced, in-depth integrated physiology of the cardiovascular and respiratory systems. The physiological dynamics, control mechanisms, and system interrelationships of the cardiovascular, respiratory, and kidney systems are discussed. Students make applications of cardiopulmonary physiology, dynamics, and control to both normal and abnormal functions.

CES G201 Cardiopulmonary Pathophysiology 3 SH

Offers lecture and laboratory study of the physiology and pathophysiology of the cardiovascular and pulmonary systems as applied to the dysfunction of the cardiopulmonary patient.

CES G202 Electrocardiography 3 SH

Covers intermediate and advanced electrocardiography including cardiac electrophysiology, lead systems, dysrhythmia recognition and treatment, axis, infarction, ischemia, hypertrophy, and the effects of cardiovascular drugs and exercise on the EKG. Students review case studies based upon exercise testing and cardiac rehabilitation scenarios.

CES G203 Clinical Pharmacology 3 SH

Studies the current medications used in the treatment of chronic cardiovascular, pulmonary, metabolic, musculoskeletal, neuromuscular, and immunological diseases.

CES G220 Exercise Physiology 3 SH

Covers the advanced study of concepts, principles, and research in the field of exercise physiology. Discusses advanced concepts in the muscular/neuromuscular, cardiovascular, ventilatory, endocrine, and metabolic responses to exercise and exercise training. Specific study of the physiological control mechanisms regulating these systems are also addressed during periods of rest, acute exercise, and following chronic exercise training.

CES G221 Clinical Cardiopulmonary Exercise Testing 2 SH

Offers a practicum in clinical cardiopulmonary exercise testing including pharmacologic stress testing. Offers students the opportunity to learn monitoring techniques for EKG, blood

pressure, pulmonary, and metabolic responses to exercise. Also exposes students to radionuclide and echocardiographic stress testing techniques.

CES G222 Exercise in Health and Disease 3 SH
Studies the role of exercise in health and disease including acute and chronic effects of exercise on individuals with cardiovascular, pulmonary, metabolic, and immunologic diseases and disorders. Also explores exercise prescriptions, training guidelines, and therapeutic benefits of exercise intervention and rehabilitation for individuals with heart disease, vascular disease, chronic obstructive pulmonary disease, diabetes, obesity, renal failure, cancer, and immunologic disorders.

CES G223 Echocardiography 3 SH
Covers the use of echocardiography to diagnose cardiovascular disorders and disease. Emphasizes standards of care for obtaining echocardiographic images and the interpretation of echocardiograms. Electrophysiology studies are also covered. Laboratory experiences are integrated into the course where students have the opportunity to learn basic clinical skills.

CES G224 Cardiac Life Support 3 SH
Prepares students to be part of resuscitation teams. Covers the skills and knowledge found in core cases described by the American Heart Association (AHA). Emphasis is on developing competency for management of core cases, especially the first ten minutes of cardiac arrest due to ventricular fibrillation. The resuscitation algorithms for various types of cardiopulmonary arrest are covered. The knowledge and skills needed by each member of the resuscitation team are mastered.

CES G225 Clinical Exercise Physiologist Workshop 3 SH
Offers a four-day workshop for clinical exercise physiologists to advance their knowledge, skills, and competencies in basic assessment and exercise testing, prescription, programming, and counseling individuals with cardiovascular, pulmonary, metabolic, musculoskeletal, neuromuscular, and immunologic diseases.

CES G230 Musculoskeletal Pathophysiology 3 SH
Provides the clinical exercise physiologist with an understanding of the etiology, epidemiology, pathophysiology, and pathokinetics of musculoskeletal diseases and disabilities. Considers the clinical basis of neuromuscular diseases that affect gait and coordination. Clinical application is directed toward the role of exercise in the management of the disease or disability and modifications that may need to be made in a preventive or rehabilitative program.

CES G231 Musculoskeletal Assessment 2 SH
Provides the clinical exercise physiologist with the basic knowledge, skills, and abilities to administer exercise, fitness, work simulation, and functional tests; prescribe exercise; and supervise exercise programs for individuals with musculoskeletal diseases and disabilities. Also reviews basic knowledge of the physical examination and diagnostic techniques utilized for this population.

CES G401 Clinical Exercise Physiology Internship 1 3 SH
Provides a supervised internship in a clinical exercise physiology program or a clinical exercise-testing laboratory, providing care to individuals with chronic cardiovascular, pulmonary, metabolic, or musculoskeletal diseases. Offers students the opportunity to participate in clinical exercise testing, exercise prescription and programming, and/or exercise leadership under the supervision of a clinical exercise physiologist. Students are required to present relevant case studies during weekly seminar discussions.

CES G402 Clinical Exercise Physiology Internship 2 3 SH
Continues CES G401. Provides continuation of supervised internship experiences in a clinical exercise physiology program or a clinical exercise-testing laboratory, providing care to individuals with chronic cardiovascular, pulmonary, metabolic, or musculoskeletal diseases. Offers students the opportunity to participate in clinical exercise testing, exercise prescription and programming, and/or exercise leadership under the supervision of a clinical exercise physiologist. Students are required to present relevant case studies during weekly seminar discussions.

CES G403 Clinical Exercise Physiology Internship 3 3 SH
Continues CES G402. Provides continuation of supervised internship experiences in a clinical exercise physiology program or a clinical exercise-testing laboratory, providing care to individuals with chronic cardiovascular, pulmonary, metabolic, or musculoskeletal diseases. Offers students the opportunity to participate in clinical exercise testing, exercise prescription and programming, and/or exercise leadership under the supervision of a clinical exercise physiologist.

CES G501 Directed Study 1 SH
CES G502 Directed Study 2 SH
CES G503 Directed Study 3 SH
Offers independent course work under the direction of members of the department on a chosen topic. Requires submission of a written proposal to the program adviser prior to the intended semester.

CES G691 Thesis 1 3 SH
Provides initiation to scholarly investigation. Requires students to submit a written research proposal, which includes the first three chapters of the thesis (introduction, review of literature, and methods and procedures) for approval by a thesis committee and to present an oral proposal at a seminar.

CES G692 Thesis 2 3 SH
Continues CES G691. Comprises thesis work with data collection, statistical analysis, presentation of results, discussion, and recommendations for further study. Culminates in an approved written thesis.

CES G699 Master's Thesis Continuation 0 SH
Continuation of thesis work with data collection, statistical analysis, presentation of results, discussion, and recommendations for further study. Culminates in an approved written thesis.

- CES U101** Cardiopulmonary and Exercise Sciences Seminar 1 1 SH
Reviews the goals, policies, and procedures of the co-op program. Covers the referral process and co-op options within the cardiopulmonary and exercise sciences program. Provides opportunities to learn effective job search strategies through developing résumés, preparing for interviews, identifying work values, and understanding how to make informed choices. Reviews case studies related to communication, problem solving, ethical and workplace issues, and appropriate coping mechanisms and resources.
- CES U201** Cardiopulmonary and Exercise Sciences Seminar 2 1 SH
Continues CES U101. Introduces cardiopulmonary and exercise sciences students to professional and ethical issues within the cardiopulmonary and exercise sciences major through presentations, discussions, and self-evaluation. Reviews each concentration within the department to enable students to make informed decisions about their career choices. *Prereq. Sophomore standing in CES.*
- CES U202** Basic Clinical Skills 3 SH
Provides student with basic life support, blood pressure and pulse assessment, EKG preparation, medical history assessment, and personal-care skills. Students also develop skills in patient record keeping, patient transport, basic oxygen therapy administration, medical asepsis, oxygen supply systems, and use of patient monitoring systems. Upon satisfactory completion of the course, students are issued American Heart Association basic life support health-care provider cards.
- CES U277, CES U278, CES U279** 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- CES U300** Cardiopulmonary Physiology and Pathophysiology 4 SH
Focuses on in-depth integrated physiology of the cardiovascular and respiratory systems. Physiological dynamics and control mechanisms of the events of circulation and respiration comprise a major portion of the course. Applications of cardiopulmonary physiology, dynamics, and control are made to both normal function and the disease process of common cardiopulmonary disease states. *Prereq. 64 SH toward CES degree.*
- CES U301** Cardiopulmonary Assessment 4 SH
Emphasizes the assessment of the cardiovascular and pulmonary systems. Covers the application to practice of clinical laboratory, pulmonary function testing, sleep laboratory, chest radiography, and basic electrocardiography including arrhythmia recognition. Assessment techniques used for patients of varying age, from neonatal to geriatric, are discussed. Physical assessment techniques for acute and chronically ill patients are compared and contrasted. *Prereq. 64 SH toward CES degree.*
- CES U302** Cardiopulmonary Disease 4 SH
Emphasizes understanding the etiology, pathophysiology, clinical signs, and treatment of cardiopulmonary disease. Focuses on case development and organization of information according to the medical or surgical problem being treated. *Prereq. 64 SH toward CES degree.*
- CES U400** Statistics and Research Design 4 SH
Examines descriptive statistics, probability, correlation, and the fundamentals of statistical inference using t-tests and one-way analysis of variance. Introduces students to concepts related to evidence-based clinical practice. Topics include empirical and qualitative research methods and ethical issues in research. Offers students the opportunity to read and evaluate scientific literature and perform basic statistical analyses using computer-based statistical software. *Prereq. 64 SH toward CES degree.*
- CES U477, CES U478, CES U479** 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- CES U500** Exercise Physiology 1 4 SH
Introduces exercise physiology. Covers the muscular, neuromuscular, cardiovascular, ventilatory, endocrine, and metabolic responses to acute exercise and the physiological adaptations to chronic exercise and physical activity. Basic concepts related to physical fitness, body composition, weight control, and training principles are discussed. *Coreq. CES U501. Prereq. Junior or senior standing in CES.*
- CES U501** Lab for CES U500 1 SH
Accompanies CES U500. Offers experiments in the exercise physiology laboratory that introduce concepts related to the lecture content of the course and include techniques such as strength testing, ergometry, graded exercise testing, indirect calorimetry, and body composition assessment. *Coreq. CES U500. Prereq. Junior or senior standing in CES.*
- CES U502** Exercise Testing and Prescription 4 SH
Focuses on skills needed to perform cardiopulmonary graded exercise tests, body composition, and musculoskeletal fitness evaluations for healthy adults. Concentrates on the design, implementation, and evaluation of individual exercise prescriptions and fitness programs. Assists in preparation for professional certification examinations. *Coreq. CES U503. Prereq. CES U500, CES U501, and CES U504 or taken concurrently and junior or senior standing in CES.*
- CES U503** Lab for CES U502 0 SH
Accompanies CES U502. Covers topics from the course through various experiments. *Coreq. CES U502. Prereq. Junior or senior standing in CES.*

- CES U504 Clinical Kinesiology** 4 SH
Investigates the science of human motion and anatomical and mechanical principles as they relate to an understanding of skillful, efficient, and purposeful human motion. Students examine the internal and external forces acting on a human body and their effects. Clinical emphasis specific to the exercise physiologist is on normal and abnormal joint structure and function, posture, and gait. *Coreq. CES U505. Prereq. Junior or senior standing in CES.*
- CES U505 Lab for CES U504** 0 SH
Accompanies CES U504. Covers topics from the course through various experiments. *Coreq. CES U504. Prereq. Junior or senior standing in CES.*
- CES U506 Health Promotion and Program Planning** 4 SH
Focuses on the principles and practices of health promotion planning and development of health promotion and counseling skills necessary to work with clients effectively to evoke behavioral change. Concentrates on the design and evaluation of health promotion programs. *Prereq. CES U500, CES U502, and CES U504.*
- CES U508 Echocardiography** 4 SH
Covers the use of echocardiography to diagnose cardiovascular disorders and disease. Standards of care for obtaining echocardiographic images and interpretation of echocardiograms are emphasized. Electrophysiology studies are also covered. Laboratory experiences covering basic clinical skills are integrated into the course. *Prereq. Senior standing in CES.*
- CES U509 Lab for CES U508** 0 SH
Accompanies CES U508. Covers topics from the course through various experiments. *Prereq. Senior standing in CES.*
- CES U520 Exercise Physiology 2** 3 SH
Continues CES U500. Covers the advanced study of concepts, principles, and research in the field of exercise physiology. Advanced concepts are discussed in the areas of muscular/neuromuscular, cardiovascular, ventilatory, endocrine, and metabolic responses to exercise and exercise training. Addresses specific study of the physiological control mechanisms regulating these systems during periods of rest, acute exercise, and following chronic exercise training. *Prereq. CES U500, CES U502, and CES U504.*
- CES U600 Fundamentals of Respiratory Therapy** 4 SH
Focuses on the theory and application of medical gas administration, humidity/aerosol therapy, and basic modalities of respiratory care. Reviews basic microbiology, medical asepsis, and introduces mechanical ventilation. *Coreq. CES U601. Prereq. Junior or senior standing in CES.*
- CES U601 Lab for CES U600** 1 SH
Accompanies CES U600. Provides hands-on practice with respiratory therapy equipment and procedures through laboratory exercises and simulation of patient-care situations. *Coreq. CES U600. Prereq. Junior or senior standing in respiratory therapy.*
- CES U602 Advanced Respiratory Therapy Practice** 4 SH
Focuses on advanced clinical assessment and patient management skills used to plan respiratory therapy for critically ill medical and surgical patients. Covers invasive and noninvasive monitoring techniques. Covers adjustment of mechanical ventilators with emphasis on understanding modes of ventilation, control interaction, and waveform analysis. Uses interactive computer clinical simulations to gain experience in physical assessment, interpretation of diagnostic tests, and selection of critical pathways for management of medical and surgical patients in intensive-care units. Also covers management of cardiovascular failure, interventional pulmonary procedures, and procedural conscious sedation. *Coreq. CES U603. Prereq. CES U600, CES U601, CES U945, and senior standing in respiratory therapy.*
- CES U603 Lab for CES U602** 1 SH
Accompanies CES U602. Provides practice in adult critical-care skills through laboratory exercises with mechanical ventilators, critical-care monitoring systems, and simulation of patient-care situations. *Coreq. CES U602. Prereq. CES U600, CES U601, CES U945, and senior standing in respiratory therapy.*
- CES U604 Neonatal and Pediatric Respiratory Therapy** 3 SH
Focuses on advanced assessment and management skills used to plan respiratory therapy for pediatric and neonatal patients. Covers adjustment of mechanical ventilators with emphasis on understanding modes of ventilation, control interaction, and waveform analysis. Examines care of newborns with emphasis on treatment of respiratory distress syndrome. *Coreq. CES U605. Prereq. CES U945, senior standing in respiratory therapy, and permission of faculty adviser.*
- CES U605 Lab for CES U604** 1 SH
Accompanies CES U604. Provides practice in neonatal and pediatric-care skills through laboratory exercises with mechanical ventilators, life-support systems, critical-care monitoring systems, and simulation of patient-care situations. *Coreq. CES U604. Prereq. CES U945, senior standing in respiratory therapy, and permission of faculty adviser.*
- CES U606 Advanced Cardiovascular Life Support** 3 SH
Prepares students to be part of resuscitation teams. Covers the skills and knowledge found in core cases described by the American Heart Association. Emphasis is on developing competency for management of core cases, especially the first ten minutes of cardiac arrest due to ventricular fibrillation or pulseless ventricular tachycardia. Covers the resuscitation algorithms for various types of cardiopulmonary arrest. The knowledge and skills needed by each member of the resuscitation team are mastered. *Prereq. Senior standing in CES.*
- CES U677, CES U678, CES U679** 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

CES U701 Senior Thesis in Exercise Physiology 1 6 SH
Offers directed study in a student's major in which in-depth investigation of a special interest area is undertaken. Requires the student to submit a written research proposal for approval by a major faculty adviser and a minimum of one faculty consultant. *Prereq. Senior standing in exercise physiology and permission of faculty adviser.*

CES U702 Senior Thesis in Exercise Physiology 2 6 SH
Continues CES U701. Offers directed study in a student's major in which in-depth investigation of a special interest area is undertaken. Requires the student to collect and analyze data and submit a written research report for approval by a major faculty adviser and a minimum of one faculty consultant. *Prereq. CES U701, senior standing in exercise physiology, and permission of faculty adviser.*

CES U910 Clinical Seminar in Respiratory Therapy 1 SH
Discusses clinical topics and respiratory-care issues encountered during clinical practice using case studies. *Prereq. Senior standing in respiratory therapy.*

CES U921 Directed Study 1 SH

CES U922 Directed Study 2 SH

CES U923 Directed Study 3 SH

CES U924 Directed Study 4 SH

Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

CES U940 Practicum in Exercise Physiology 1 6 SH

Provides supervised internship experiences in which students have the opportunity to practice and demonstrate competency in specific knowledge and professional skills under the direct supervision of an exercise physiologist. Rotations include areas of exercise testing, exercise prescription, and exercise leadership in a fitness and/or health promotion program. Students may also have opportunities for experience in exercise and wellness program development, administration, and health counseling. Students assume more responsibility and develop the skills necessary to function independently. *Prereq. Senior standing in exercise physiology.*

CES U941 Practicum in Exercise Physiology 2 6 SH

Continues CES U940. Provides supervised internship experiences in which students have the opportunity to practice and demonstrate competency in specific knowledge and professional skills under the direct supervision of an exercise physiologist. Students have the opportunity to work with individuals and groups in the areas of health programs. Students may also have opportunities for experience in exercise and wellness program development, administration, and health counseling. Students assume more patient-care responsibility and develop the skills necessary to function independently. *Prereq. CES U940 and senior standing in exercise physiology.*

CES U945 Practicum in Respiratory Therapy 1 4 SH

Provides clinical experience in hospitals sixteen hours/week. Focuses on respiratory care for the noncritical patient. Emphasizes infection control, medical gas administration, humidification of medical gases, aerosol therapy, chest physiotherapy, hyperinflation therapy, and the administration of aerosolized medications. *Prereq. Junior or senior standing in respiratory therapy.*

CES U946 Practicum in Respiratory Therapy 2 6 SH

Continues CES U945. Provides clinical experience in hospitals twenty-four hours/week. Emphasizes respiratory care for adult critical-care patients. Focuses on artificial airway care, mechanical ventilation, positive-end expiratory pressure, and other mechanical ventilation adjuncts. *Prereq. CES U945 and senior standing in respiratory therapy.*

CES U947 Practicum in Respiratory Therapy 3 6 SH

Continues CES U946. Provides clinical experience in hospitals, diagnostic labs, and rehab/home-care settings. Emphasizes respiratory care for pediatric and neonatal critical-care patients. Students also rotate through pulmonary function lab and rehab/home-care environment. *Prereq. CES U604, CES U605, CES U946, and senior standing in respiratory therapy.*

CES U970 Junior/Senior Project 1 4 SH

Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

CES U971 Junior/Senior Project 2 4 SH

Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. CES U970 and honors program participation.*

COMPUTER ENGINEERING TECHNOLOGY

SCHOOL OF ENGINEERING TECHNOLOGY

CET U201 Visual Basic Programming 4 SH

Introduces the concepts of objects, object-oriented programming, event-driven programming, and rapid application development using the Visual Basic programming language. As an introductory course to programming, presentations include the proper techniques of program development, documentation, and stepwise development. Individually, students examine how to create simple applications but also explore a more challenging group project. *Coreq. CET U202.*

CET U202 Lab for CET U201 0 SH

Accompanies CET U201. Covers topics from the course through various experiments. *Coreq. CET U201.*

CET U277, CET U278, CET U279 Honors Adjunct Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each	CET U322 Lab for CET U321 Accompanies CET U321. Covers topics from the course through various experiments. <i>Coreq. CET U321.</i>	0 SH
CET U301 Introduction to C++ Programming Introduces students to C++ programming language, its history, its applications, and its implementation. Rudiments of the language are presented along with a detailed explanation of how different programming constructs are used. Weekly programming assignments complement laboratory exercises allowing students to learn about primitive data types, arrays and structures, program control details, strings, pointers, and class libraries. Also includes a brief introduction to the Standard Template Library. <i>Coreq. CET U302. Prereq. CET U201.</i>	4 SH	CET U331 Assembly Language Introduces students to machine language fundamentals and a detailed description of the assembly language of the '86 series of processors. Students become proficient in writing short programs that integrate operating system functions with specific user requirements. The need and application for assembly language is presented along with a detailed explanation of addressing modes, register implementation techniques, and mapping of high-level languages into machine code. Skills include proper program structure, and use of an editor, assembler, linker, and program debugger. <i>Coreq. CET U332. Prereq. CET U301.</i>	4 SH
CET U302 Lab for CET U301 Accompanies CET U301. Covers topics from the course through various experiments. <i>Coreq. CET U301.</i>	0 SH	CET U332 Lab for CET U331 Accompanies CET U331. Covers topics from the course through various experiments. <i>Coreq. CET U331.</i>	0 SH
CET U306 C++/Data Structures Covers C++ classes, data structures, and the Standard Template Library. The use of classes to hide information and implementation is presented. Arrays, stacks, lists, linked lists, queues, dequeues, trees, and graphs are described and implemented using conventional programming techniques and class libraries. Provides an intensive study of class construction and utilization as an important part of program creation. <i>Coreq. CET U307. Prereq. CET U201.</i>	4 SH	CET U335 Numerical Methods Presents computer methods for solving mathematical problems. Involves writing and running application programs using the University's computer facilities. Covers deterministic vs. stochastic methods, random number generators, iterative vs. noniterative solutions, maxima and minima in two and three variables, curve fitting in two and three variables, integrals, trapezoidal and Simpson's rules, slopes, differential equations in two and three variables, vector and matrix algebra, simultaneous linear equations, nonlinear equations, permutations, and combinations. <i>Prereq. CET U306 and MTH U243.</i>	4 SH
CET U307 Lab for CET U306 Accompanies CET U306. Covers topics from the course through various experiments. <i>Coreq. CET U306.</i>	0 SH	CET U341 Digital Electronics Design Introduces students to the rudiments of digital electronics. Includes a device-level description of semiconductor circuits that provide switching capabilities. Expands this concept to commercially available integrated circuit logic families and presents important applications of them. Includes a brief mathematical treatment of the families including sum of products, product of sums, Karnaugh mapping, and other logic reduction concepts. Simulation of actual circuits using conventional software tools aid in the creation of actual digital functions. <i>Coreq. CET U342. Prereq. CET U301 and CET U311.</i>	4 SH
CET U311 Computer Organization and Architecture Describes the major components of a computer system. Details the range of products and devices that comprise a typical computer system ranging from the personal to the corporate mainframe machine. Topics include CPUs, storage devices, memory components, printers and peripherals, software, and the integration of different subsystems. Covers these topics broadly from a device level and is a prerequisite for other, more detailed courses. <i>Coreq. CET U312. Prereq. CET U201.</i>	4 SH	CET U342 Lab for CET U341 Accompanies CET U341. Covers topics from the course through various experiments. <i>Coreq. CET U341.</i>	0 SH
CET U312 Lab for CET U311 Accompanies CET U311. Covers topics from the course through various experiments. <i>Coreq. CET U311.</i>	0 SH	CET U346 Microperipherals Explains the basic structure of microperipheral devices and their role in extending the reach of the CPU beyond memory manipulation. Provides a rigorous treatment of serial and parallel ports, timers, modems, DMA controllers, hardware handshaking, and interface details. Offers a brief explanation of the software requirements for integrating these peripherals into actual systems. Describes the importance of interrupt structures and polling. <i>Coreq. CET U347. Prereq. CET U311.</i>	4 SH
CET U321 Software Engineering Focuses on a detailed explanation of the proper techniques for software design. Includes a brief discussion of project management, team skills, financial and project planning techniques, and management techniques that should be applied to any software development effort. A significant development project is undertaken in which students solve a unique problem and present the solution to a group of interested faculty and guests. <i>Coreq. CET U322. Prereq. CET U201 and CET U302.</i>	4 SH		

CET U347 Lab for CET U346 Accompanies CET U346. Covers topics from the course through various experiments. <i>Coreq. CET U346.</i>	0 SH	CET U512 Lab for CET U511 Accompanies CET U511. Covers topics from the course through various experiments. <i>Coreq. CET U511.</i>	0 SH
CET U350 Embedded Microcomputer Systems 1 Provides an introduction to the hardware and software issues in interfacing microprocessors to the outside. Includes lab and lecture components to develop the analytical understanding and skills to design the peripheral systems for an embedded microprocessor device. Topics of bus characteristics, timing, and protocols; memory organization; memory-mapped I/O; and interrupts are covered in depth. In addition, the software requirements for implementing these devices into actual systems is given. <i>Coreq. CET U351. Prereq. CET U311 and EET U321.</i>	4 SH	CET U521 Computer Architecture Demonstrates the integration of hardware design with customer specifications/requirements for a computing device. Introduces the notion of RISC vs. CISC architectural trade-offs and exposes the underlying structures of several popular CPUs. Register transfer notation (RTN) is explained and used to provide an assembly language explanation of a machine. Also explores the use of multiple data paths and pipelining. <i>Coreq. CET U522. Prereq. CET U346.</i>	4 SH
CET U351 Lab for CET U350 Accompanies CET U350. Covers topics from the course through various experiments. <i>Coreq. CET U350.</i>	0 SH	CET U522 Lab for CET U521 Accompanies CET U521. Covers topics from the course through various experiments. <i>Coreq. CET U521.</i>	0 SH
CET U352 Embedded Microcomputer Systems 2 Continues CET U350. Combines the accomplishments of the design of peripheral devices with the design and building of complete embedded microprocessor systems to accomplish data collection, control, and analysis. <i>Coreq. CET U353. Prereq. CET U350.</i>	4 SH	CET U531 Data Communications and Networks Introduces and justifies the need for communications networks. Describes the various standards and procedures currently available for transporting data over distance. Discusses rates, formats, modulation techniques, error detection/recovery, and standards. Also introduces the concept of local area networks (LANs) and their role in the data communications arena. The seven-layer ISO model is used as the basis for both major segments of the course. A variety of different protocols are discussed. <i>Coreq. CET U532. Prereq. CET U346 and CET U521.</i>	4 SH
CET U353 Lab for CET U352 Accompanies CET U352. Covers topics from the course through various experiments. <i>Coreq. CET U352.</i>	0 SH	CET U532 Lab for CET U531 Accompanies CET U531. Covers topics from the course through various experiments. <i>Coreq. CET U531.</i>	0 SH
CET U477, CET U478, CET U479 Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each	CET U536 Advanced Networking Concepts Provides detailed information about LAN/WAN integration, internetworking, the use of routed and switched networks, and a general overview of information transfer technology. Because networking changes occur frequently, this senior-level course covers new technologies as they occur. A project is assigned to student groups that requires an understanding of the topics and networking technologies. <i>Coreq. CET U537. Prereq. CET U531 and senior standing.</i>	4 SH
CET U480 Topics in Computer Engineering Technology Focuses on advanced topics related to computer engineering technology to be selected by instructor. <i>Coreq. CET U481. Prereq. Permission of faculty adviser.</i>	4 SH	CET U537 Lab for CET U536 Accompanies CET U536. Covers topics from the course through various experiments. <i>Coreq. CET U536.</i>	0 SH
CET U481 Lab for CET U480 Accompanies CET U480. Covers topics from the course through various experiments. <i>Coreq. CET U480.</i>	0 SH	CET U546 Industry Hardware Examines the latest trends in the computer industry including both hardware and business-related issues. Covers details of leading companies, their products, and the techniques that were used to make them successful. Includes readings from multiple relevant sources that prepare graduating seniors for the issues and problems they will face in the industrial world. <i>Coreq. CET U547. Prereq. Senior standing.</i>	4 SH
CET U511 Digital Circuit Computer Simulation Offers a combination lecture seminar/computer lab course that introduces selected advanced topics in computer technology. Various digital circuits are analyzed via hand calculation analysis and computer simulation. Students discover the advantages and disadvantages of using computer simulation in solving digital electronic circuit problems and are exposed firsthand to the concept of team engineering design. <i>Coreq. CET U512. Prereq. EET U321.</i>	4 SH		

CET U547 Lab for CET U546 Accompanies CET U546. Covers topics from the course through various experiments. <i>Coreq. CET U546.</i>	0 SH	CET U652 Lab for CET U651 Accompanies CET U651. Covers topics from the course through various experiments. <i>Coreq. CET U651.</i>	0 SH
CET U551 Operating Systems Provides an overview, justification, and implementation details of the rudiments of many operating systems. Describes process and resource management techniques, file systems, and memory system implementations. Displays many of the alternatives available and describes advantages and trade-offs of each one. Uses several popular operating systems for resources and provides an exhaustive treatment of one of the current systems. <i>Coreq. CET U552. Prereq. CET U346 and CET U521.</i>	4 SH	CET U677, CET U678, CET U679 Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each
CET U552 Lab for CET U551 Accompanies CET U551. Covers topics from the course through various experiments. <i>Coreq. CET U551.</i>	0 SH	CET U921 Directed Study CET U922 Directed Study CET U923 Directed Study CET U924 Directed Study Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i>	1 SH 2 SH 3 SH 4 SH
CET U556 The UNIX Operating System Introduces UNIX operating system concepts, tools, and utilities. Topics include file organization, security techniques, operating system models, and a brief comparison of the different UNIX flavors. Develops a fundamental understanding and working knowledge of UNIX using system commands, file system concepts, text processing tools, electronic communication, processes, shell script programming, command procedures, pipes, I/O redirection, filters, system administration, and installation techniques. <i>Coreq. CET U557. Prereq. CET U306.</i>	4 SH	CET U970 Junior/Senior Project 1 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i>	4 SH
CET U557 Lab for CET U556 Accompanies CET U556. Covers topics from the course through various experiments. <i>Coreq. CET U556.</i>	0 SH	CET U971 Junior/Senior Project 2 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. CET U970 and honors program participation.</i>	4 SH
CET U558 Systems Level Programming Studies the design and development of C and C++ application programs that interface and expand capabilities of the operating system kernel. Enables programmers to interact with the various UNIX and Windows operating systems through a study of system calls and library routines. Topics include system programming tools, fundamental concepts, file creation and access, signals and signal handling, multitasking, file and terminal I/O, process creation and program execution, and forms of interprocess communication and synchronization (pipes, message queues, semaphores, and shared memory). <i>Prereq. CET U556.</i>	4 SH		
CET U559 Lab for CET U558 Accompanies CET U558. Covers topics from the course through various experiments. <i>Coreq. CET U558.</i>	0 SH		
CET U651 Advanced Computer Concepts Extends many of the fundamental subjects from previous architecture and computer hardware courses. Discusses complex peripheral devices, embedded controllers, and dedicated processing devices. Also explores parallel processing, multi-programming, multicomputing, cache memory organization concepts, and advanced memory implementation techniques. <i>Coreq. CET U652. Prereq. CET U331 and CET U521.</i>	4 SH		

CHEMICAL ENGINEERING

COLLEGE OF ENGINEERING

CHE U277, CHE U278, CHE U279 Honors Adjunct Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each
CHE U300 Introduction to Engineering Co-op Education Provides students preparation for the first co-op experience. Focuses on skills that provide a basis for successful co-op engagement including expectations and requirements; an introduction to professional credentials; résumé construction; self-assessment and goal setting; interviewing; professional and co-op ethics; issues of diversity in the workplace community; academic planning and decision making; and an introduction to career portfolios. <i>Prereq. GE U100.</i>	1 SH

CHE U306 Chemical Engineering Calculations	4 SH	Examines the application of fundamental laws of mass and energy conservation to chemical and physical processes. Emphasizes material and energy balances. <i>Prereq. CHM U151.</i>	styles and diverse personal characteristics on the workplace and the classroom. Professional issues include impact of the cultural context, both in the United States and around the world, of the client, government relations, and workplace. <i>Prereq. Junior or senior standing.</i>		
CHE U310 Transport Processes and Operations 1	4 SH	Covers the fundamental principles of transport balances with an emphasis on momentum transport of incompressible and compressible fluids. Considers macroscopic (integral) and differential balances; flux laws for molecular and convective transport; empirical correlations and dimensional analysis; analytical and computer solution methods to analyze/design for engineering transport problems in the chemical, pharmaceutical, food, and materials industries. <i>Prereq. MTH U343 and CHE U306.</i>	CHE U510 Chemical Engineering Kinetics	4 SH	Covers fundamental theories of the rate of chemical change in homogeneous reacting systems, integral and differential analysis of kinetic data; design of batch and continuous-flow chemical reactors; and an introduction to heterogeneous reactions and reactor design. <i>Prereq. CHE U312 and CHE U322.</i>
CHE U312 Transport Processes and Operations 2	4 SH	Continues CHE U310. Presents the fundamentals and applications of energy transport, mass transport, and simultaneous energy/mass transport. Macroscopic and differential balances equations are combined with appropriate flux laws and correlations to analyze and design various types of energy and/or mass transport equipment. <i>Prereq. CHE U310.</i>	CHE U512 Chemical Engineering Process Control	4 SH	Covers the Laplace transform and its use in solving ordinary differential equations; modeling and computer simulation of basic heat, mass, and fluid-flow dynamics; linearization of nonlinear systems; the transfer function; sensors, transmitters, valves, and controllers; block-diagram algebra; dynamics of higher-order systems; modeling and simulation of control-loop dynamics; frequency response; and Laplace and frequency domain stability analysis. <i>Prereq. Senior standing.</i>
CHE U320 Chemical Engineering Thermodynamics 1	4 SH	Covers the first law and its application to batch and flow systems, heat effects in chemicals, and physical properties and real fluids. Applies basic principles and mathematical relations to the analysis and solution of engineering problems. <i>Prereq. CHE U306, CHM U401, and MTH U341.</i>	CHE U520 Unit Operations and Separation Processes	5 SH	Involves experiments in unit operations including process measurements, fluid metering, heat exchangers, and separation processes. Separation processes describe the principles utilized in the separation of chemical mixtures. Introduces equilibrium stages as applied to the separation of binary mixtures by liquid-liquid extraction and by continuous distillation. <i>Coreq. CHE U521. Prereq. CHE U312 and CHE U322.</i>
CHE U322 Chemical Engineering Thermodynamics 2	4 SH	Continues CHE U320. Covers thermodynamic properties of mixtures; fugacity and the fugacity coefficients from equations of state for gaseous mixtures; liquid phase fugacities and activity coefficients for liquid mixtures; phase equilibria; the equilibrium constant for homogeneous gas-phase reactions; and extension of theory to handle simultaneous, heterogeneous, and solution reactions. <i>Prereq. CHE U320.</i>	CHE U521 Lab for CHE U520	0 SH	Accompanies CHE U520. Covers topics from the course through various experiments. <i>Coreq. CHE U520.</i>
CHE U477, CHE U478, CHE U479	1 SH each	Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	CHE U616 Mass Transfer Operations	4 SH	Focuses on the mass transfer operations of crystallization, adsorption, chromatography, ion exchange, and membrane separations. <i>Prereq. Senior standing.</i>
CHE U500 Professional Issues in Engineering	1 SH	Provides students with an opportunity to reflect on both academic and co-op experiences in the context of planning for the senior year and beyond. Issues include professional and ethical issues; resolving ethical conflicts; awareness of engineers as professionals in a diverse world; strengthening decision-making skills; career portfolios; and lifelong learning needs, goals, and strategies. Students reflect upon issues of diversity from their experience in the University and in their cooperative education placements. Explores the role of different work and learning	CHE U619 Polymer Science	4 SH	Introduces polymers and polymer chemistry, synthesis and reactions of polymers, and thermodynamics and kinetics of polymerization. Includes topics such as physical characterization of polymers; molecular structure, properties, and applications of polymers; and polymer processing and testing of polymers. <i>Prereq. Senior standing.</i>
			CHE U620 Pollution Control in Chemical Industries	4 SH	Studies fundamental operations for handling environmental problems in the chemical process industries. Discusses water quality requirements and industrial waste characteristics. <i>Prereq. Senior standing.</i>

CHE U624 Chemical Process Safety	4 SH	CHE U722 Projects 2	4 SH
Introduces students to important technical fundamentals as applied to chemical process safety. Demonstrates good chemical process safety practice through chemical plant trips, visiting experts, and video presentations. <i>Prereq. Senior standing.</i>		Continues CHE U721. Builds upon the previous course. Requires lab fee. <i>Prereq. CHE U721, senior standing, and permission of the department.</i>	
CHE U630 Biochemical Engineering Fundamentals	4 SH	CHE U921 Directed Study	1 SH
Presents key concepts in biochemistry, cell biology, enzyme kinetics, and metabolic pathways, offered as an introductory exposure to these topics and not as complete coverage of life science fundamentals. Topics include biological reactor kinetics and design, transport phenomena in bioprocess systems, and process instrumentation/control. <i>Prereq. Senior standing.</i>		CHE U922 Directed Study	2 SH
		CHE U923 Directed Study	3 SH
		CHE U924 Directed Study	4 SH
		Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i>	
CHE U677, CHE U678, CHE U679	1 SH each	CHE U931 Independent Study	1 SH
Honors Adjunct		CHE U932 Independent Study	2 SH
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>		CHE U933 Independent Study	3 SH
		CHE U934 Independent Study	4 SH
		Offers theoretical or experimental work under individual faculty supervision. <i>Prereq. Permission of instructor.</i>	
CHE U699 Special Topics in Chemical Engineering	4 SH	CHE U970 Junior/Senior Project 1	4 SH
Focuses on topics related to chemical engineering to be selected by instructor. <i>Prereq. Permission of the department.</i>		Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i>	
CHE U701 Chemical Process Design 1	5 SH	CHE U971 Junior/Senior Project 2	4 SH
Focuses on the design of a chemical process. Topics include computer simulation of steady-state processing conditions, selecting process operations, preparing flow sheets and stream tables, and evaluating the economics of a chemical process design. Explores a comprehensive chemical process design problem with a team approach. <i>Coreq. CHE U702. Prereq. CHE U510, CHE U520, and senior standing.</i>		Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. CHE U970 and honors program participation.</i>	
CHE U702 Lab for CHE U701	0 SH		
Accompanies CHE U701. Covers topics from the course through computational lab. <i>Coreq. CHE U701.</i>			
CHE U703 Chemical Process Design 2	5 SH		
Continues CHE U701. Requires each student to solve a comprehensive chemical process design problem. Topics include heat and power integration in chemical processing, design and scheduling of batch processes, sequencing separation operations, and safety considerations in process design. <i>Coreq. CHE U704. Prereq. CHE U701 and senior standing.</i>			
CHE U704 Lab for CHE U703	0 SH		
Accompanies CHE U703. Covers topics from the course through computational lab. <i>Coreq. CHE U703. Prereq. Senior standing.</i>			
CHE U721 Projects 1	4 SH		
Offers individual research related to some phase of chemical engineering. Open only to students selected by the department head on the basis of scholarship and proven ability. Requires lab fee. <i>Prereq. Senior standing and permission of the department.</i>			

CHEMISTRY AND CHEMICAL BIOLOGY

COLLEGE OF ARTS AND SCIENCES

CHM U100 College: An Introduction	1 SH
Intended for freshmen in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.	
CHM U101 General Chemistry for Health Sciences	5 SH
Provides a one-semester introduction to general chemistry for the health sciences. Covers the fundamentals of elements and atoms; ionic and molecular structure; chemical reactions and their stoichiometry, energetics, rates, and equilibria; and the properties of matter as gases, liquids, solids, and solutions. Other topics include acids and bases, and nuclear chemistry. Applications to the health sciences are included throughout. <i>Coreq. CHM U102 and CHM U103.</i>	

CHM U102 Lab for CHM U101 Accompanies CHM U101. Covers topics from the course through various experiments. <i>Coreq. CHM U101 and CHM U103.</i>	0 SH	CHM U213 Recitation for CHM U211 Accompanies CHM U211. Covers various topics from the course. <i>Coreq. CHM U211 and CHM U212.</i>	0 SH
CHM U103 Recitation for CHM U101 Accompanies CHM U101. Covers various topics from the course. <i>Coreq. CHM U101 and CHM U102.</i>	0 SH	CHM U214 General Chemistry 2 Continues CHM U211. Introduces the principles of chemistry focusing on chemical equilibria, the nature of some common materials, and energy considerations in chemical transformations. Covers solutions, chemical kinetics, chemical equilibria, chemical thermodynamics, electrochemistry, and chemistry of the representative elements. <i>Coreq. CHM U215 and CHM U216. Prereq. CHM U211.</i>	5 SH
CHM U104 Organic Chemistry for Health Sciences Provides a one-semester introduction to organic chemistry for the health sciences. Covers the fundamentals of the structure, nomenclature, properties, and reactions of the compounds of carbon. Also introduces biological chemistry including amino acids, proteins, carbohydrates, lipids, nucleic acids, hormones, neurotransmitters, and drugs. Applications to the health sciences are included throughout. <i>Coreq. CHM U105 and CHM U106. Prereq. CHM U101.</i>	5 SH	CHM U215 Lab for CHM U214 Accompanies CHM U214. Covers topics from the course through various experiments. <i>Coreq. CHM U214 and CHM U216.</i>	0 SH
CHM U105 Lab for CHM U104 Accompanies CHM U104. Covers topics from the course through various experiments. <i>Coreq. CHM U104 and CHM U106.</i>	0 SH	CHM U216 Recitation for CHM U214 Accompanies CHM U214. Covers various topics from the course. <i>Coreq. CHM U214 and CHM U215.</i>	0 SH
CHM U106 Recitation for CHM U104 Accompanies CHM U104. Covers various topics from the course. <i>Coreq. CHM U104 and CHM U105.</i>	0 SH	CHM U277, CHM U278, CHM U279 Honors Adjunct Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each
CHM U151 General Chemistry for Engineers Provides a one-semester course in general chemistry for engineering majors. Covers the fundamentals of chemistry, chemical calculations, atomic and molecular structure, states of matter and solutions, and chemical reactions and equilibria. <i>Coreq. CHM U152 and CHM U153.</i>	4 SH	CHM U311 Organic Chemistry 1 Introduces nomenclature, preparation, properties, stereochemistry, and reactions of common organic compounds. Presents correlations between the structure of organic compounds and their physical and chemical properties, and mechanistic interpretation of organic reactions. Includes chemistry of hydrocarbons and their functional derivatives. <i>Coreq. CHM U312. Prereq. CHM U214.</i>	5 SH
CHM U152 Lab for CHM U151 Accompanies CHM U151. Covers topics from the course through various experiments. <i>Coreq. CHM U151 and CHM U153.</i>	1 SH	CHM U312 Lab for CHM U311 Accompanies CHM U311. Covers topics from the course through various experiments. <i>Coreq. CHM U311.</i>	0 SH
CHM U153 Recitation for CHM U151 Accompanies CHM U151. Covers various topics from the course. <i>Coreq. CHM U151 and CHM U152.</i>	0 SH	CHM U313 Organic Chemistry 2 Continues CHM U311. Focuses on additional functional group chemistry including alcohols, ethers, carbonyl compounds, and amines, and also examines chemistry relevant to molecules of nature. Introduces spectroscopic methods for structural identification. <i>Coreq. CHM U314. Prereq. CHM U311.</i>	5 SH
CHM U211 General Chemistry 1 Introduces the principles of chemistry, focusing on the states and structure of matter and chemical stoichiometry. Presents basic concepts and definitions, moles, gas laws, atomic structure, periodic properties, and chemical bonding. <i>Coreq. CHM U212 and CHM U213.</i>	5 SH	CHM U314 Lab for CHM U313 Accompanies CHM U313. Covers topics from the course through various experiments. <i>Coreq. CHM U313.</i>	0 SH
CHM U212 Lab for CHM U211 Accompanies CHM U211. Covers topics from the course through various experiments. <i>Coreq. CHM U211 and CHM U213.</i>	0 SH		

CHM U321 Analytical Chemistry	5 SH	CHM U477, CHM U478, CHM U479	1 SH each
Covers the principles and practice of methods of chemical analysis with an introduction to heterogeneous equilibria, modern spectrophotometry, electroanalysis, and chromatographic methods. Examines method development and validation, equilibrium limitations in analysis, and statistical evaluation of data as well as applications for the fields of biochemistry, industrial and environmental chemistry, and chemical research. <i>Coreq. CHM U322. Prereq. CHM U151 or CHM U214.</i>		Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	
CHM U322 Lab for CHM U321	0 SH	CHM U501 Inorganic Chemistry	4 SH
Accompanies CHM U321. Covers topics from the course through various experiments. <i>Coreq. CHM U321.</i>		Presents the following topics: basic concepts of molecular topologies, coordination compounds, coordination chemistry, isomerism, electron-transfer reactions, substitution reactions, molecular rearrangements and reactions at ligands, and biochemical applications. <i>Prereq. CHM U401.</i>	
CHM U331 Bioanalytical Chemistry	5 SH	CHM U521 Instrumental Methods of Analysis	5 SH
Develops good critical thinking and problem-solving skills through the exploration of open-ended group projects in a laboratory-based course centered on the analytical chemistry of biomolecules. Develops an understanding of the practice and business aspects of analytical chemistry as they relate to research and development labs in the biotechnology/pharmaceutical industry. <i>Coreq. CHM U332. Prereq. CHM U214.</i>		Provides laboratory-intensive coverage of principles, instrumental methods, and applications of electroanalytical chemistry, optical spectroscopy, and chromatography. Includes selected topics in instrumental design and function and in nonoptical spectroscopy including mass spectrometry. <i>Coreq. CHM U522. Prereq. CHM U321 and CHM U401.</i>	
CHM U332 Lab for CHM U331	0 SH	CHM U522 Lab for CHM U521	0 SH
Accompanies CHM U331. Covers topics from the course through various experiments. <i>Coreq. CHM U331.</i>		Accompanies CHM U521. Covers topics from the course through various experiments. <i>Coreq. CHM U521.</i>	
CHM U401 Physical Chemistry 1	5 SH	CHM U531 Chemical Synthesis Characterization	5 SH
Introduces chemical thermodynamics. Covers the three laws of thermodynamics and their applications to thermochemistry, reaction, and phase equilibria. Includes quantitative use of phase diagrams. Labs demonstrate measurements of physical chemical phenomena, experimental methodology, data analysis, and computer interfacing of experimental apparatus. <i>Coreq. CHM U402. Prereq. CHM U151 or CHM U214, MTH U341, and MTH U343.</i>		Provides laboratory-intensive focus on methods for synthesis and characterization of organic, inorganic, and organometallic compounds. Includes handling of air and moisture-sensitive materials, purification techniques, and spectroscopic analysis. <i>Coreq. CHM U532. Prereq. CHM U313.</i>	
CHM U402 Lab for CHM U401	0 SH	CHM U532 Lab for CHM U531	0 SH
Accompanies CHM U401. Covers topics from the course through various experiments. <i>Coreq. CHM U401.</i>		Accompanies CHM U531. Covers topics from the course through various experiments. <i>Coreq. CHM U531.</i>	
CHM U403 Physical Chemistry 2	5 SH	CHM U600 Research Skills and Ethics in Chemistry	3 SH
Continues CHM U401. Presents kinetics and transport processes, kinetic molecular theory, and reaction mechanisms. Introduces the fundamental principles of quantum mechanics and their application to chemical problems and atomic and molecular spectroscopy. <i>Coreq. CHM U404. Prereq. CHM U401.</i>		Covers ethics in science; documentation of work in your laboratory notebook; safety in a chemical research laboratory; principles of experimental design; online computer searching to access chemical literature; reading and writing technical journal articles; preparation and delivery of an effective oral presentation; and preparation of a competitive research proposal. <i>Prereq. CHM U313.</i>	
CHM U404 Lab for CHM U403	0 SH	CHM U611 Analytical Separations	3 SH
Accompanies CHM U403. Covers topics from the course through various experiments. <i>Coreq. CHM U403.</i>		Describes the theory and practice of separating the components of complex mixtures in the gas and liquid phase. Methods to enhance separation efficiency and detection sensitivity are also included. Includes thin layer, gas and high-performance liquid chromatography (HPLC), and recently developed techniques based on HPLC, including capillary and membrane-based separation, and capillary electrophoresis. <i>Prereq. CHM U521.</i>	

- CHM U612 Principles of Mass Spectrometry 3 SH
Describes the theory and practice of ion separation in electrostatic and magnetic fields and their subsequent detection. Topics include basic principles of ion trajectories in electrostatic and magnetic fields; design and operation of inlet systems and electron impact ionization; and mass spectra of organic compounds. *Prereq. CHM U521.*
- CHM U613 Optical Methods of Analysis 3 SH
Describes the application of optical spectroscopy to qualitative and quantitative analysis. Includes the principles and application of emission, absorption, scattering, and fluorescence spectroscopies; spectrometer design; elementary optics; and modern detection techniques. *Prereq. CHM U521.*
- CHM U614 Electroanalytical Chemistry 3 SH
Describes the theory of electrode processes and modern electroanalytical experiments. Topics include the nature of the electrode-solution interface (double layer models); mass transfer (diffusion, migration, and convection); types of electrodes; reference electrodes; junction potentials; kinetics of electrode reactions; controlled potential methods (cyclic voltammetry, chronoamperometry); chronocoulometry and square wave voltammetry; and controlled current methods (chronopotentiometry). *Prereq. CHM U521.*
- CHM U626 Organic Synthesis 1 3 SH
Surveys types of organic reactions including stereochemistry, influence of structure and medium, mechanistic aspects, and synthetic applications. *Prereq. CHM U313.*
- CHM U627 Mechanistic and Physical Organic Chemistry 3 SH
Surveys tools used for elucidating mechanisms including thermodynamics, kinetics, solvent and isotope effects, and structure/reactivity relationships. Discusses molecular orbital theory, aromaticity, and orbital symmetry. Also explores reactive intermediates including carbenes, carbonium ions, radicals, biradicals and carbanions, acidity, and photochemistry. *Prereq. CHM U313 or CHM U403.*
- CHM U628 Spectroscopy of Organic Compounds 3 SH
Determines organic structure based on proton and carbon nuclear magnetic resonance spectra, with additional information from mass and infrared spectra and elemental analysis. Presents descriptive theory of nuclear magnetic resonance experiments and applications of advanced techniques to structure determination. Includes relaxation, nuclear Overhauser effect, polarization transfer, and correlation in various one- and two-dimensional experiments. *Prereq. CHM U313.*
- CHM U636 Thermodynamics 3 SH
Covers first law of thermodynamics, thermochemistry, second and third laws of thermodynamics, free energies, and reaction and phase equilibria. Introduces the Boltzmann distribution, partition functions and their application to thermodynamics, and phase space. Applies statistical thermodynamics to selected physical systems. *Prereq. CHM U403.*
- CHM U637 Foundations of Spectroscopy 3 SH
Covers the fundamentals of quantum mechanics, with applications to spectroscopy of atoms, molecules, and proteins. Topics include introduction to quantum mechanics; mathematical tools; rigid rotor; microwave spectroscopy; harmonic oscillator; infrared and Raman spectroscopy; hydrogen atom; emission spectra; electron spin; and applications to molecular and biological systems. *Prereq. CHM U403.*
- CHM U638 Molecular Modeling 3 SH
Introduces molecular modeling methods that are basic tools in the study of macromolecules. Structured partly as a practical laboratory using a popular molecular modeling suite, and also aims to elucidate the underlying physical principles upon which molecular mechanics is based. These principles are presented in supplemental lectures or in laboratory workshops. *Prereq. CHM U403.*
- CHM U639 Chemical Kinetics 3 SH
Explores the use of experimental data to deduce the rate law of a reaction. Covers mechanisms deduced from rate laws, and the influence of experimental error on precision of rate constants and activation energies. Examines collision- and transition-state theories of reaction rates. *Prereq. CHM U403.*
- CHM U646 Synthesis and Reactivity of Inorganic Compounds 3 SH
Offers an advanced undergraduate/introductory graduate course in inorganic chemistry. Topics include an introduction to solid-state structures and the origin of color in inorganic compounds. The synthesis, reactivity, and bonding of transition metal coordination compounds are described along with applications in health-related fields. *Prereq. CHM U403.*
- CHM U660 Analytical Biotechnology 3 SH
Focuses on the analysis of biological molecules, which include nucleic acids, proteins, carbohydrates, lipids, and metabolites. Methods used for isolation, purification, and characterization of these molecules are discussed. *Prereq. CHM U611 or CHM U613.*
- CHM U669 Environmental Analytical Chemistry 3 SH
Describes the application of instrumental methods for analyzing environmental samples for major, minor, and trace components of toxicological concern. Topics include sampling strategies for natural systems, determination of trace metals in natural waters and biologicals, determination of xenobiotics by GC, LC, GC-MS, and LC-MS, remote sensing of atmospheric pollutants, molecular biomarkers, and detection of protein and DNA adducts. *Prereq. CHM U613.*
- CHM U672 Organic Synthesis 2 3 SH
Continues CHM U626. Surveys types of organic reactions including stereochemistry, influence of structure and medium, mechanistic aspects, and synthetic applications. *Prereq. CHM U626.*

- CHM U676 Biorganic Chemistry 3 SH
Covers host-guest complexation by crown ethers, cryptands, podands, spherands, and so on; molecular recognition including self-replication; peptide and protein structure; coenzymes and metals in bioorganic chemistry; nucleic acid structure; interaction of DNA with proteins and small molecules including DNA-targeted drug design; catalytic RNA; and catalytic antibodies. *Prereq. CHM U627.*
- CHM U677, CHM U678, CHM U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- CHM U686 Fundamentals of Molecular Structure 3 SH
and Electronics
Continues topics in CHM U637, which include many-electron atoms, simple diatomic molecules, conjugated pi-electron systems, the electronic structure of molecules, molecular modeling, and modeling of proteins and biological systems. *Prereq. CHM U637.*
- CHM U687 Principles of Solid-State Chemistry 3 SH
Provides an overview of solid-state materials from a chemistry perspective. Specific perspectives are those of classification, characterization, and structure-property relationships, and synthesis and design of tailor-made materials to meet future technological needs. Relevant theory and practice of spectroscopic methods is included, as well as concepts of physics involved with structure-property relationships. *Prereq. CHM U501.*
- CHM U688 Principles of Magnetic Resonance 3 SH
Presents the physical principles underlying magnetic resonance spectroscopy including Fourier transform theory, classical and quantum-mechanical treatments of spin angular momentum, the Bloch equations, spin relaxation, and density matrix formalism applied to chemical and molecular dynamics. Different magnetic resonance methods are introduced, with emphasis on time-domain nuclear magnetic resonance (NMR) methods such as phase cycling, two-dimensional spectroscopy, and selective pulse sequences. A special topic may be included from among the following: magnetic resonance imaging (MRI), solid-state NMR (CP-MAS), or macromolecular structure. *Prereq. CHM U637.*
- CHM U696 Organometallic Chemistry 3 SH
Focuses on organometallic chemistry of the transition metals, addressing the structure, bonding, and reactivity patterns of transition metal organometallic complexes with applications to organic synthesis. Topics include metal carbonyls, metal p-complexes, insertion and elimination reactions, and catalysis using transition metal organometallic compounds. *Prereq. CHM U501.*
- CHM U698 Physical Methods in Chemistry 3 SH
Introduces resonance spectroscopy, electronic absorption spectroscopy, electronic states and structure, and NMR spectroscopy. Concentrates on interpretation and origin of resonance of inorganic nuclei. *Prereq. CHM U646.*
- CHM U750 Senior Research 4 SH
Conducts original experimental work under the direction of members of the department on a project. Introduces experimental design based on literature and a variety of techniques depending upon the individual project. *Coreq. CHM U770. Prereq. CHM U403.*
- CHM U770 Chemistry Capstone 4 SH
Integrates and assesses both curricular and experiential aspects of undergraduate chemical education. Requires written and oral presentations related to cooperative education or other experiential activities, and to the senior research project. Reporting on the research project requires extensive library and Internet research of background and scientific principles, and organization and interpretation of results. Includes class discussion and critiquing of materials presented. *Coreq. CHM U750.*
- CHM U901 Undergraduate Research 4 SH
Conducts original research under the direction of members of the department. *Prereq. CHM U313 or CHM U321, 64 SH toward degree, permission of instructor and the department, and minimum GPA 2.8 in CHM major.*
- CHM U921 Directed Study 1 SH
CHM U922 Directed Study 2 SH
CHM U923 Directed Study 3 SH
CHM U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. CHM U313, CHM U321, 64 SH toward degree, permission of instructor and the department, and minimum GPA 2.8 in CHM major.*
- CHM U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*
- CHM U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. CHM U970 and honors program participation.*

CINEMA STUDIES

COLLEGE OF ARTS AND SCIENCES

CIN U113 Film Music 4 SH
 Surveys the use of music in film and video and gives an overview of the mechanics of synchronization and the psychological implications of applying music to film. Analyzes specific dramatic situations, followed by discussion of such scoring techniques as click tracks and picture recording. Studies films such as *The Informer*, *Alexander Nevsky*, *Citizen Kane*, *Forbidden Planet*, *Woman in the Dunes*, and *Tron*. Discusses the works and careers of specific film composers such as David Raksin, Aaron Copland, Jerry Goldsmith, Sergei Prokofiev, and John Williams.

CIN U120 Exploring the Humanities through Film 4 SH
 Investigates the ways in which the methods of the humanities can expand one's awareness of the sources, statements, and meanings of popular films. Presents films for evaluation in the light of reading, various approaches presented by faculty members from a number of humanistic disciplines, and student's own experiences.

CIN U150 Film Analysis 4 SH
 Covers the basic elements of narrative film form and style. Students are expected to become familiar with different aspects of cinematography, mise-en-scène, and editing, as well as the various ways in which these elements are integrated in different types of fiction film.

CIN U240 Latin American Film 4 SH
 Examines prizewinning Latin American films based on actual events, such as those that occurred during the Argentine military dictatorship of the 1970s, or works of fiction by well-known authors, such as Nobel Prize winner García Márquez. These films ably depict the history and culture of these countries. Conducted in English and the films are in Spanish with English subtitles.

CIN U250 Australian Film 4 SH
 Focuses particularly on the Australian film industry, but also considers the coproductions made in New Zealand and Canada. Explores the legacy of colonial history and the post-colonial trajectories of the Antipodean countries through analysis of film representations, industry developments, and audience reception parties.

CIN U255 Chinese Film: Gender and Ethnicity 4 SH
 Introduces students to cultural, cross-cultural, intellectual, and social issues that lead them to an informed understanding of Chinese film. Selected films are organized under the topics of gender, ethnicity, and urbanity. Outstanding directors are examined closely to illustrate these topics. Conducted in English.

CIN U260 Japanese Film 4 SH
 Provides an introduction to Japanese film through works by great masters such as Kurosawa, Mizoguchi, and Ozu, as well as works by new directors from the 1980s and 1990s such as Itami, Morita, and Suo. Studies both form and content; relates major works to Japanese culture. Conducted in English.

CIN U265 Spanish Civil War on Film 4 SH
 Introduces the Spanish film and provides an understanding of the Spanish Civil War (1936–1939). Uses a semiotic approach; studies images of the Spanish Civil War in photographs and posters to show how fictional and historical texts are transferred to the screen. Examines both documentaries and award-winning feature films by prominent Spanish directors. Demonstrates how the realism of the prominent Spanish directors is combined with surrealist imagery and metaphor to create a distinctive visual style. Conducted in English.

CIN U270 Modern German Film and Literature 4 SH
 Introduces contemporary issues in German culture. Studies the importance of the Faust legend. Considers major novels. Considers stories and poems by Böll, Grass, Mann, and Brecht as adapted by a new generation of filmmakers: Fassbinder, Schlöndorff, Sanders-Brahms, and Wenders. Conducted in English.

CIN U277, CIN U278, CIN U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

CIN U280 French Film and Culture 4 SH
 Provides an introduction to some of the qualities that have made French film one of the great national cinemas. Focuses on both form and content; relates outstanding directors' major works to the French culture and society of their period. Conducted in English.

CIN U300 Screenwriting 4 SH
 Designed to appeal to those students who want to learn the specific techniques required when writing for the screen. The course's aim is for students to produce a completed script in their chosen format, while considering the industrial, institutional, and other factors relevant to scriptwriters. Students are encouraged to experiment with these elements in their own writing. *Prereq.* Sophomore standing or above.

CIN U335 History of Film 4 SH
 Surveys major international developments in film from the late nineteenth century to the present. Examines national movements, technological and aesthetic innovations, important figures, and significant films. Includes films, lectures, and discussions. *Prereq.* One prior course in art history is recommended.

- CIN U336 American Film 4 SH
Surveys the rise of American film from the late nineteenth century to the present. Examines key films, directors, major themes, and film forms and techniques. Includes lectures, screenings, and discussions. *Prereq. One prior course in art history is recommended.*
- CIN U337 Contemporary Directions in Cinema 4 SH
Provides a comparative study of major international film movements from 1960 to the present. Studies selected films by representative contemporary directors. Includes lectures, screenings, and discussions. *Prereq. One prior course in art history is recommended.*
- CIN U350 Film Theory 4 SH
Investigates the aesthetics, philosophical assumptions, and sociological context of several different approaches to filmmaking: the Hollywood cinema, the art cinema, Soviet montage, independent films, and essay films. The concluding section of the course takes film noir as a specific historical example and studies the way it combines elements from both the commercial Hollywood film and the art cinema. *Prereq. CIN U120, INT U120, or CIN U150 and sophomore standing or above.*
- CIN U354 Psychology and Film 4 SH
Uses selected films to investigate psychological subjects including human development over the life cycle (particularly childhood and adolescence), family dynamics, sexuality, and psychopathology (trauma, anxiety and eating disorders, and psychosis). *Prereq. PSY U101.*
- CIN U386 History of Soviet Cinema 4 SH
Surveys the emergence and development of the film industry in the USSR. Examines the political, economic, ideological, and artistic sources of Soviet cinema and their relationship to Russian culture and history. Directors considered include Eisenstein, Vertov, Pudovkin, Dovzhenko, Kozintsev, Kalatozov, and Tarkovsky. *Prereq. Sophomore standing or above and an introductory history course is strongly recommended.*
- CIN U390 Film and Psychoanalysis 4 SH
Explores the nature and possibilities of the psychoanalytic interpretation of film, demonstrating that such an approach offers an additional dimension to the analysis of a work of art. Focuses on elements in the work that are derivative of unconscious processes, especially fantasies, dreams, symbolism, and imagery. Discusses material in the works studied that relates to neurotic conflicts, character structure and formation, interpersonal relationships, and distortions in psychological development. *Prereq. Sophomore standing or above.*
- CIN U391 Topics in Film 4 SH
Covers special topics in cinema studies. *Prereq. ENG U111 or equivalent and sophomore standing or above.*
- CIN U392 Topics in Cinema Studies 4 SH
Covers special topics in cinema studies. *Prereq. Sophomore standing or above.*
- CIN U394 Modern Film 4 SH
Studies a selection of major modern films from around the world from a thematic, cultural, and historical perspective. Special attention is given to political, social, ethical, and psychological issues, as well as to the way common human themes emerge in quite diverse cultures. Also covers the basic procedures of film interpretation. *Prereq. ENG U111 or equivalent.*
- CIN U395 American Film Survey 4 SH
Surveys the history of American film from the silent era to the present. Considers the internal history of the film industry and film art, as well as the relationship between film considered as a site of cultural debate and social history. Films studied include *Birth of a Nation*, *The Gold Rush*, *The Gold Diggers of 1933*, *Citizen Kane*, *Mildred Pierce*, *On the Waterfront*, *The Graduate*, and others. *Prereq. ENG U111 or equivalent.*
- CIN U421 History through Film 4 SH
Explores various historical issues as seen through the eyes of historians and filmmakers. Presents both acted and documentary films in combination with readings from a variety of sources and interpretive materials. Through a series of case studies, the first half of the course looks at the ways in which filmmakers use (and abuse) history as a source of dramatic “stories,” while the second uses the same approach to understand the ways that historians use visual media to understand the politics and culture of the times they were made and as historical evidence. *Prereq. Sophomore standing or above and an introductory history course is strongly recommended.*
- CIN U446 Topics in Documentary Production 4 SH
Covers special topics and studies in documentary production. *Prereq. Permission of instructor.*
- CIN U460 Jewish Film 4 SH
Explores major themes and issues in American Jewish life—assimilation and intermarriage, anti-Semitism, and the Holocaust—through the lens of popular film. Includes weekly screenings of films such as *Annie Hall* and *The Producers* and readings, lectures, and discussions.
- CIN U477, CIN U478, CIN U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- CIN U488 Film and Text 4 SH
Studies either the similarities and differences between literary texts and film versions of those texts or the interrelations between film and literature as means of cultural expression during a specific historical period. Students might compare Doctorow’s *Book of Daniel* to the film version, *Daniel*, or they might study books and movies of a period like the sixties that reflect the spirit of the era (*Catch-22*, *The Graduate*). *Prereq. ENG U111 or equivalent.*

CIN U489 Shakespeare on Film	4 SH	CIN U941 Cinema Studies Internship	1 SH
Examines the various treatments of Shakespeare's plays on film. Treats the technical aspects of film and how these are used by directors to transfer Shakespeare's plays from the stage to the screen. <i>Prereq. ENG U111 or equivalent.</i>		CIN U942 Cinema Studies Internship	2 SH
		CIN U943 Cinema Studies Internship	3 SH
		CIN U944 Cinema Studies Internship	4 SH
		Comprises academic credit for internship work in cinema studies. <i>Prereq. Permission of instructor.</i>	
CIN U500 Modernism/Modernity and Film	4 SH	CIN U945 Cinema Studies Practicum	1 SH
Offers an interdisciplinary course that traces the modernist impulse in literature, film, art, and architecture from the early twentieth century to the multifaceted development of postmodernism at the end of the century. Emphasizes the relationship of art to society, and studies the way in which modernism's revolutionary strategies required constant innovation and renewal in the face of such challenges as fascism, the Cold War, and postcolonial struggles for national identity. Students complete individual projects (creative or research paper) and also contribute to the Web site Boston modernism (http://www.atsweb.neu.edu/bostonmodernism). Counts as a capstone course for the cinema studies dual major. <i>Prereq. CIN U350 and junior or senior standing.</i>		CIN U946 Cinema Studies Practicum	1 SH
		CIN U947 Cinema Studies Practicum	2 SH
		CIN U948 Cinema Studies Practicum	2 SH
		CIN U949 Cinema Studies Practicum	3 SH
		Provides students with hands-on experience in cinema techniques or theory. <i>Prereq. Permission of interdisciplinary studies department.</i>	
		CIN U970 Junior/Senior Project 1	4 SH
		Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i>	
CIN U550 Cinema Studies Seminar	4 SH	CIN U971 Junior/Senior Project 2	4 SH
Offers various topics from year to year. Counts as a capstone course for cinema studies dual majors. <i>Prereq. CIN U350 and junior or senior standing.</i>		Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. CIN U970 and honors program participation.</i>	
CIN U650 Page to Screen	4 SH		
Requires different roles on at least three collaborative short digital video projects. In the preproduction stage, students choose scripts and prepare shooting scripts; seek out actors, locations, props, and costumes; and arrange sponsorships and organize other elements necessary for the production to run efficiently. During production, crews go on location or into the studio to shoot their film. In postproduction, students work on editing their material, creating graphics for the credits sequences, or arranging publicity materials for the films. Classes may run overtime, especially during the production stage of the course. Students should plan on additional filming outside of class time in order to complete their projects. <i>Prereq. CIN U150 and CIN U300.</i>			
CIN U677, CIN U678, CIN U679	1 SH each		
Honors Adjunct			
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>			
CIN U921 Directed Study	1 SH		
CIN U922 Directed Study	2 SH		
CIN U923 Directed Study	3 SH		
CIN U924 Directed Study	4 SH		
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i>			

CIVIL ENGINEERING

COLLEGE OF ENGINEERING

CIV U221 Statics and Strength of Materials 4 SH
Introduces solid mechanics including properties of areas and volumes (centroidal axes, moments of inertia, and so on), equilibrium of particles and rigid bodies in two and three dimensions, analysis of internal forces in trusses, shear and moment diagrams in beams, mechanical properties of materials, and elastic analysis of stresses and strains in members subject to axial load and torsion. *Coreq. MTH U341. Prereq. PHY U151.*

CIV U260 Civil Engineering Materials 3 SH
Introduces the physical, mechanical, and chemical properties of materials of importance to civil engineers. Offers an overview of the ways in which these properties affect the material selection process, material behavior, and the design process. *Coreq. CIV U261 or CIV U262. Prereq. CHM U151, MTH U242, and PHY U151.*

- CIV U261 Materials Lab** 2 SH
Involves the use of standard lab test methods and equipment to determine properties of materials common to civil engineering practice. Also introduces students to land surveying, site layout, and the measurement of distance, elevation, and direction. *Coreq. CIV U260.*
- CIV U262 Materials Lab PTE** 1 SH
Involves the use of standard lab test methods and equipment to determine properties of materials common to civil engineering practice. This course is a subset of CIV U261 intended only for students in the part-time evening program. Credit is not given for both this course and CIV U261. *Coreq. CIV U260.*
- CIV U277, CIV U278, CIV U279** 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- CIV U300 Introduction to Engineering Co-op Education** 1 SH
Provides students preparation for the first co-op experience. Focuses on skills that provide a basis for successful co-op engagement including expectations and requirements, an introduction to professional credentials, résumé construction, self-assessment and goal setting, interviewing, professional and co-op ethics, issues of diversity in the workplace community, academic planning and decision making, and an introduction to career portfolios. *Prereq. GE U100.*
- CIV U320 Structural Analysis 1** 4 SH
Covers shear stresses in beams, combined stress analysis (bars with axial load plus shear and bending), introduction to buckling, influence lines (application to statically determinate systems), computation of deflections (statically determinate systems), and analysis of indeterminate structures using the flexibility method and moment distribution. *Prereq. CIV U221.*
- CIV U324 Reinforced Concrete Design** 4 SH
Covers design of common reinforced concrete structural elements. Explores mechanical properties of steel and concrete. Examines behavior and design of reinforced concrete beams, one-way slab systems, footings, and short columns based on latest ACI-318 code. *Prereq. CIV U320.*
- CIV U331 Fluid Mechanics and Hydraulic Engineering** 4 SH
Introduces the principles of fluid mechanics and the applications in basic hydraulic engineering systems. Topics include properties of fluids; pressure and force on surfaces and submerged bodies; continuity, momentum, and energy conservation principles; dimensional analysis and hydraulic similitude; flow in closed conduits; steady flow in pipe networks; unsteady flow in pipes; flow in open channels; hydraulic machines; and hydraulic structures. The laboratory component includes demonstrations and experiments to show the applicability of fluid mechanics and hydraulics principles. *Prereq. CIV U221.*
- CIV U334 Environmental Engineering 1** 4 SH
Focuses on protection and management of the environment. Topics include assessment of environmental quality; introduction to water and wastewater treatment technologies; air pollution control; and solid waste management. *Prereq. CHM U151.*
- CIV U340 Soil Mechanics** 4 SH
Studies soil classification, subsurface exploration, soil-water phase relations, groundwater seepage, consolidation theory, strength properties of soils, stress distributions in soils due to surface loads, determination of soil-bearing capacity, and slope stability. *Coreq. CIV U341. Prereq. CIV U221 or CIV U260.*
- CIV U341 Lab for CIV U340** 1 SH
Accompanies CIV U340. Introduces standard laboratory procedures for characterizing the physical, hydraulic, and mechanical properties of soils as well as data reduction and analysis methods for various test methods. Laboratory methods and determinations include moisture content, Atterberg limits, permeability, compaction, consolidation, and direct shear. Includes the use of computer-based data acquisition systems and measurement transducers. *Coreq. CIV U340.*
- CIV U425 Steel Design** 4 SH
Concentrates on design of steel members subject to tension, compression, bending, and combinations of loading, and design of connections, braced frames, and rigid frames. Design is based on the latest load resistance factor specifications of the American Institute for Steel Construction code. The theoretical basis of code formulas is also emphasized. *Coreq. CIV U320.*
- CIV U464 Probability and Engineering Economy** 4 SH
for Civil Engineering
Introduces engineering probability and statistics, as well as engineering economic analysis for project or design evaluation. Case studies are used to illustrate the integration of these areas in the design/system analysis process. Topics in engineering probability and statistics include descriptive statistics, expected value of random variables, and hypotheses testing. Statistical process control and sampling methods are introduced. Reliability methods for the analysis and improvement of system/design performance are discussed. Also covers fundamental concepts of time value of money and economic evaluation of alternatives, including the effects of depreciation and taxes. *Prereq. MTH U341.*
- CIV U477, CIV U478, CIV U479** 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

<p>CIV U500 Professional Issues in Engineering 1 SH Provides students with an opportunity to reflect on both academic and co-op experiences in the context of planning for the senior year and beyond. Issues include professional and ethical issues; resolving ethical conflicts; awareness of engineers as professionals in a diverse world; strengthening decision-making skills; career portfolios; and lifelong learning needs, goals, and strategies. Students reflect upon issues of diversity from their experience in the University and in their cooperative education placements. Explores the role of different work and learning styles and diverse personal characteristics on the workplace and the classroom. Professional issues include impact of the cultural context, both in the United States and around the world, of the client, government relations, and workplace. <i>Prereq. Junior or senior standing.</i></p>	<p>CIV U542 Foundation Engineering 4 SH Explores soil-bearing capacity determination, design of shallow foundations and pile foundations, and design of retaining walls and excavation support systems. <i>Prereq. CIV U340.</i></p>
<p>CIV U522 Structural Analysis 2 4 SH Continues CIV U320. Covers analysis of indeterminate structural systems using matrix methods. Studies how to implement matrix analysis of indeterminate structures using both flexibility and stiffness approaches. Serves as an introduction to the finite element method. <i>Prereq. CIV U320 and MTH U343.</i></p>	<p>CIV U545 Geoenvironmental Engineering 4 SH Examines definitions and regulations, soil formation and mineralogy, hydraulic conductivity measurements, reactive contaminant transport through fine-grained soils, landfill and liners design, seepage barriers and cutoff walls, and introduces site characterization and remediation. <i>Prereq. Senior standing.</i></p>
<p>CIV U530 Solid and Hazardous Waste Management 4 SH Introduces various aspects of integrated solid waste management system and hazardous waste management practices. Includes both engineering principles as well as socioeconomic and regulatory issues surrounding solid and hazardous waste management. Provides sufficient background to enable the student to understand, evaluate, and critique the design of and the decisions in various waste management alternatives. <i>Prereq. Senior standing.</i></p>	<p>CIV U553 Transport Analysis and Planning 4 SH Studies the analysis and planning of urban passenger transportation including fundamentals of alternative travel modes, travel demand forecasting, impact assessment, and economic analysis. Discusses transportation and the urban context, and current transportation planning and policy issues. <i>Prereq. MTH U241.</i></p>
<p>CIV U532 Environmental Protection and Management 4 SH Examines public and private environmental quality management and resource protection systems including consideration of regulatory issues, risk management approaches, local vs. regional impacts, long-term sustainability, and economic/financial issues. Covers selected current topics and a broad range of specific environmental issues. <i>Prereq. Senior standing.</i></p>	<p>CIV U554 Highway Engineering 4 SH Concentrates on highway design including route selection, geometric design, foundation and pavement design, drainage design, and construction issues. Analyzes highway traffic including traffic flow fundamentals and capacity and level of service analysis for freeways and rural highways. Covers the environmental impact and public review process for highway construction. Includes project component. <i>Prereq. CIV U261.</i></p>
<p>CIV U534 Environmental Engineering 2 4 SH Continues CIV U334. Concentrates on unit operations, unit processes, and related fundamental design of physical, chemical, and biological water and wastewater treatment systems, using both lectures and laboratory instruction. Topics include aeration systems, activated sludge, fixed-film biological treatment, gas transfer, reaction kinetics, reactor modeling, coagulation, flocculation, sedimentation, filtration, and subsurface disposal system design. <i>Prereq. CIV U331 and CIV U334.</i></p>	<p>CIV U556 Traffic Engineering 4 SH Covers traffic flow theory and measurement, capacity and level of service analysis for intersections, arterials, and highways, intersection design, traffic analysis and design software, and transportation systems management. <i>Prereq. Permission of instructor.</i></p>
<p>CIV U536 Hydrologic Engineering 4 SH Introduces principles of engineering hydrology. Covers the hydrologic cycle; rainfall-runoff relationships; hydrologic flood routing; and groundwater hydraulics. Applies these concepts to issues such as water supply and storm-water management. Includes project component. <i>Prereq. CIV U331.</i></p>	<p>CIV U575 Construction Management 3 SH Surveys the construction industry and tasks that must be addressed by construction management including resource allocation, construction environment, organization, contracts, funding, cash flow, productivity, conceptual and detailed cost estimating, labor relations, network planning and scheduling, construction accounting, and project control. <i>Prereq. Junior or senior standing.</i></p>
	<p>CIV U677, CIV U678, CIV U679 1 SH each Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>
	<p>CIV U699 Special Topics in Civil Engineering 4 SH Covers special topics in civil engineering initiated by the appropriate discipline committee and approved by the department. <i>Prereq. Permission of instructor.</i></p>

CIV U700 Civil Engineering Research 4 SH
Offers independent work for students in the University Honors Program under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of the department.*

CIV U769 Senior Design Project 5 SH
Using teams, students design a civil engineering project that involves one or more subdisciplines (environmental, geotechnical, structural, and transportation engineering). Design teams are advised by a faculty member and engineering practitioners. Lectures cover cross-disciplinary aspects of project development, value engineering, aesthetics, and constructibility. Integrates project design with further development of student communications skills; students present the design to practicing engineers and interested parties such as community groups. *Prereq. Senior standing.*

CIV U921 Directed Study 1 SH
CIV U922 Directed Study 2 SH
CIV U923 Directed Study 3 SH
CIV U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

CIV U931 Independent Study 1 SH
CIV U932 Independent Study 2 SH
CIV U933 Independent Study 3 SH
CIV U934 Independent Study 4 SH
Offers theoretical or experimental work under individual faculty supervision. *Prereq. Permission of instructor.*

CIV U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

CIV U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. CIV U970 and honors program participation.*

CRIMINAL JUSTICE

COLLEGE OF CRIMINAL JUSTICE

CJ U100 College: An Introduction 1 SH
Designed to help students adjust to college life and become fully acquainted with the resources and services offered by the University. Covers various campus services, studies how to

access various library resources, and focuses on study skills and time management. Also explores various careers for which the criminal justice major can prepare students. The course is pass/fail.

CJ U101 Introduction to Criminal Justice 4 SH
Surveys the contemporary criminal justice system in the United States. Students examine the phases of the criminal justice system beginning with the detection of crimes by the police, the handling of the case through the courts, and finally the disposition and sentencing of offenders. Issues and characteristics of each of the phases (police, courts, and corrections) are examined as well as identifying the key actors (police, judges, prosecutors, correctional officers, and so forth) of each phase of the criminal justice system. Also introduces students to the U.S. juvenile justice system.

CJ U102 Ethics, Values, and Diversity 4 SH
Focuses on the ethical dilemmas facing key actors in the criminal justice system. Also examines the increasing diversity of society and how these changes are affecting the criminal justice system. Investigates the myths and realities surrounding race, gender, social class, and crime, and the roles these issues have played in criminal sentencing particularly involving the death penalty. Investigates ethical dilemmas faced by police, courts, and correctional authorities in dealing with an increasingly multicultural society.

CJ U110 Criminal Due Process 4 SH
Focuses on a historical evaluation of the Fourteenth Amendment of the U.S. Constitution and its use in making rights prescribed under the Bill of Rights applicable to the individual states. Examines constitutional requirements in the administration of criminal justice with particular emphasis on the Fourth, Fifth, and Sixth Amendment requirements and their implications on police practices in the areas of arrests, searches and seizures, right to counsel, and eyewitness identification. Expects students to be familiar with basic concepts and legal language as well as the court's changing interpretations of the law. Briefing of cases is required. *Prereq. CJ U101.*

CJ U120 Criminology 4 SH
Describes the nature and extent of crime, explains its causes, and examines the reasons for and effectiveness of society's responses to it. Defines the topic of criminology by discussing the different types of crime. Moreover, to establish the extent of crime in society, measurement issues are addressed. The second half of the course details different theories of criminal causation. *Prereq. CJ U101.*

CJ U277, CJ U278, CJ U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

- CJ U290 Co-op Integration Seminar 1 1 SH
 Orients students for co-op. Offers an overview of how to prepare résumés, practice interviewing skills, consider what students can/should expect from their first co-op, and discuss what employers' expectations are likely to be of them. Prepares students to integrate what they learned in the freshman diversity course into their first co-op. Students are also instructed on how to prepare a journal systematically during the first co-op on issues related to ethics, values, and diversity.
- CJ U310 Criminal Law 4 SH
 Discusses the definition of common crimes and criminal responsibility. Addresses moral, philosophical, constitutional, and public policy considerations in the use of criminal sanctions to regulate conduct. Requires the knowledge of particular criminal law concepts and the ability to identify them in complex fact patterns and discuss their implications and ramifications. Also requires the application of legal principles to fact situations in a logical way. Case briefing is required. *Prereq. CJ U110 and CJ U120.*
- CJ U330 Corrections 4 SH
 Examines the concept of punishment and its form, function(s), and enforcement throughout history, with an emphasis on current sentencing policies and procedures and their impact on the corrections system and correctional overcrowding. Explores the operation, structure, clientele, and issues confronting the institutions, agencies, and programs encompassing the corrections system including jails, prisons, and community-based corrections. *Prereq. CJ U110 and CJ U120.*
- CJ U340 Security 4 SH
 Examines the history and evolution of security from a focus on crime prevention to one of loss prevention for business, industry, institutions, and government. Emphasizes the need for analytical, interpersonal, and communications skills in developing cost-effective programs for the protection of assets, personnel, and third parties. Discusses the security/government relationship. *Prereq. CJ U110 and CJ U120.*
- CJ U350 Policing 4 SH
 Traces the history, evolution, and organization of the police in the United States. Examines the role of police in society; structure and culture of police organizations; function and activities of the police; and police deviance and accountability. The course objectives are to acquaint students with prior research on the police, examine critically the police as a component of the criminal justice system, explore the complex nature of the profession, and assist those who are considering a policing career to understand the realities of the job. *Prereq. CJ U110 and CJ U120.*
- CJ U360 Juvenile Justice 4 SH
 Introduces students to the history, structure, processes, and philosophies of juvenile justice systems in the United States. Responses to juvenile offenders—ranging from prevention and diversion to institutional corrections and aftercare—are explored in the context of youth policy generally. Focuses on contemporary issues and controversies (system fragmentation, changing conceptions of juvenile offenders, lack of a coherent justice system rationale, racial and gender bias in processing and confinement, and proposals to abolish the juvenile court). *Prereq. CJ U110 and CJ U120.*
- CJ U380 Criminal Justice Research Methods 4 SH
 Introduces the basic concepts involved in conducting research in the areas of the criminal justice system and criminology. Through lectures, group discussions, and readings, familiarizes students with the scientific methods that are necessary for systematic analysis of crime trends, offender behavior, program effectiveness, and public attitudes about crime and justice. In so doing, students become capable of developing an idea, investigating and critiquing how it has been researched, developing a research design, and administering its implementation. *Prereq. CJ U110 and CJ U120.*
- CJ U382 Criminal Justice Statistics 4 SH
 Develops the basic foundation for which statistical properties are applied, with an emphasis on applications in criminal justice. Challenges students to understand both descriptive and inferential statistics including hypothesis testing. Develops the knowledge and understanding necessary to comprehend and interpret basic statistics in criminal justice research literature and reports. While an extensive mathematics background is not required, students should be familiar with basic algebra before taking this course. *Prereq. CJ U380 and MTH U110 or equivalent.*
- CJ U390 Co-op Integration Seminar 2 1 SH
 Continues CJ U290. Allows students to reflect on what they learned during their first co-op, and use their journal entries as the basis from which to examine real-life issues of ethics, values, and diversity as they experienced them in the workplace.
- CJ U400 Topics in Criminal Justice 4 SH
 CJ U401 Topics in Criminal Justice 4 SH
 Focuses on topics related to criminal justice to be selected by instructor. *Prereq. Permission of instructor.*
- CJ U402 Topics in Policing 4 SH
 CJ U403 Topics in Policing 4 SH
 Focuses on topics related to policing to be selected by instructor. *Prereq. Permission of instructor.*
- CJ U404 Topics in Legal Studies 4 SH
 CJ U405 Topics in Legal Studies 4 SH
 Focuses on topics related to legal studies to be selected by instructor. *Prereq. Permission of instructor.*
- CJ U406 Topics in Criminology 4 SH
 CJ U407 Topics in Criminology 4 SH
 Focuses on topics related to criminology to be selected by instructor. *Prereq. Permission of instructor.*

CJ U408 Topics in Corrections	4 SH	literature that documents case studies of crime prevention programs. <i>Prereq. CJ U110 and CJ U120.</i>
CJ U409 Topics in Corrections	4 SH	
Focuses on topics related to corrections to be selected by instructor. <i>Prereq. Permission of instructor.</i>		
CJ U410 Topics in Juvenile Justice	4 SH	CJ U510 Juvenile Law 4 SH Introduces the way society responds to juvenile offenders. Topics may include important legislation, fundamental case law, behavioral research studies, philosophy, history, delinquency, abuse and neglect, transfers and waivers, status offenses, and comparative law. Students may be required to observe actual juvenile cases in the Massachusetts Juvenile Court. <i>Prereq. CJ U310 and junior or senior standing.</i>
CJ U411 Topics in Juvenile Justice	4 SH	
Focuses on topics related to juvenile justice to be selected by instructor. <i>Prereq. Permission of instructor.</i>		
CJ U412 Topics in Security	4 SH	CJ U512 Legal Philosophy 4 SH Explores the great legal philosophers with emphasis on nineteenth- and twentieth-century philosophers and their contributions to legal philosophy in the United States. Examines in depth the development of American legal philosophy and its role in the administration of American justice. <i>Prereq. CJ U310.</i>
Focuses on topics related to security to be selected by instructor. <i>Prereq. Permission of instructor.</i>		
CJ U477, CJ U478, CJ U479	1 SH each	CJ U515 Courts and Sentencing 4 SH Examines the role of criminal courts in the United States, the structure and organization of the court system, and the flow of cases from arrest to conviction. Focuses on the key actors in the courtroom—prosecutors, defense attorneys, judges, and court clerks—and the decision-making processes in charging a person with a crime, setting bail, pleading guilty, going to trial, and sentencing. Addresses prospects for reforming courts. <i>Prereq. CJ U110.</i>
Honors Adjunct		
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>		
CJ U500 Gender, Crime, and Justice	4 SH	CJ U518 Law and Psychology 4 SH Examines a broad array of topics, from criminal profiling to an examination of the nature of justice and its relationship to social control. Focuses on five major questions: what forensic psychologists do; how psychologists and lawyers look at the world; how the criminal justice system (police, courts, and corrections) and other institutions involved in social control use psychologists; what psychologists think about the criminal justice system and other institutions of social control; and how psychological (and other behavioral science) research can be used to help prevent crime. Because psychologists and lawyers see the world very differently, the course can help facilitate communication and understanding among present and future practitioners in each field, as well as in criminal justice and delinquency prevention generally. <i>Prereq. CJ U110 and CJ U120.</i>
Examines the topics of femininities and masculinities and their influence on participants in the criminal justice system. Also explores topics such as gender and criminological theory; the notion of gender and offending; women and men as victims of violence; and women and men as professionals within the criminal justice system. <i>Prereq. CJ U110 and CJ U120.</i>		
CJ U502 Race, Crime, and Justice	4 SH	CJ U520 Communities and Crime 4 SH Provides students with an overview of issues related to communities and crime. Examines sociological aspects of community context, behavior, and functioning, and how communities are implicated in both crime-generating and crime-preventing processes. Familiarizes students with historical and contemporary literatures surrounding the communities and crime relationship, as well as how the study of human behavior generally, and crime particularly, should examine the interaction of persons and places. <i>Prereq. CJ U110 and CJ U120.</i>
Provides students with an overview of the role and treatment of racial/ethnic minorities in the criminal justice system. Covers historical and theoretical frameworks for understanding the relationship between race, crime, and criminal justice. In so doing, students become familiar with trends and patterns in criminal offending by racial/ethnic minorities, as well as system response to such behavior. <i>Prereq. CJ U110 and CJ U120.</i>		
CJ U506 Criminal Justice Organization and Management	4 SH	
Provides students with an overview of issues related to criminal justice organization and management. Covers the manner in which criminal justice agencies deal with crime and criminological issues, as well as how such agencies are organized and managed to find ways to deal with the crime problem. Students become familiar with the operations of criminal justice organization and management, and how individuals navigate and work with criminal justice agencies to deal with crimes. <i>Prereq. CJ U110 and CJ U120.</i>		
CJ U508 Crime Prevention	4 SH	
Provides students with an overview of issues related to crime prevention, both from criminological and criminal justice points of view. Examines crime prevention programs that encompass both the individual and community levels, as well as the integration of such levels. Topics such as situational crime prevention are also discussed. Students also study		

- CJ U522 Comparative Criminal Justice 4 SH
Examines the problems of crime and its control from the vantage point of the comparative perspective. Students compare the crime and criminological issues of the United States with those found in other countries around the world. Examines both the incidence and type of crime across (and within) societies, as well as the operation of the criminal justice system in its attempts at social control and crime prevention. *Prereq. CJ U110 and CJ U120.*
- CJ U525 Psychology of Crime 4 SH
Explores the inner lives of offenders including cognitive, emotional, perceptual, and physiological phenomena. Examines the ecological context of crime, individual, and social risk factors for psychological attributes related to offending; how these attributes develop; how they interact with the environment to produce crime; and most importantly, how knowledge of the psychology of crime can assist in efforts to prevent delinquency or to help offenders desist.
- CJ U530 Community-Based Corrections 4 SH
Provides an in-depth understanding of the variety of correctional options for law violators that are available within the community. Through lectures, group discussions, presentations, and reading of empirical research, students become knowledgeable about all forms of corrections and correctional facilities outside of jails and prisons, from traditional incarceration programs to the most current programs such as electronic monitoring, house arrest, day treatments, boot camps, and fines. Also discusses the philosophy and effectiveness of different types of community-based corrections while keeping in perspective the impact they have on each component of the criminal justice system. *Prereq. CJ U330.*
- CJ U535 Correctional Intervention 4 SH
Examines the foundations of correctional interventions including overviews of the major systems of therapeutic intervention, diagnosis of mental illness, and correctional assessment and classification. Explores both theoretical and practical knowledge of the methods, strategies, and effectiveness of treating special populations such as sex offenders and substance abusers. Studies special topics such as problems of matching therapists and therapy methods to personality and setting, difficulties in the control and treatment of nonamenable and dangerous offenders, and the short-term reeducational and treatment methods uniquely suited to institutional settings. *Prereq. CJ U330.*
- CJ U540 Security Management, Supervision 4 SH
Covers the duties and responsibilities of security managers and supervisors with special attention paid to planning, organizing, budgeting, staffing, directing, innovating, and overseeing the implementation of cost-effective loss prevention programs. Examines the manager's role in security's professionalization and related issues. *Prereq. CJ U340.*
- CJ U550 Police Strategy 4 SH
Examines current strategies utilized by U.S. police. Topics include the demand for police service, service delivery, missions and goals, resources and tactics, accountability, ethics, and operational effectiveness measurements. Emphasis is on successfully accomplishing the police mission in a responsible manner and within the many constraints under which officers and departments must operate. Focuses on in-class small-group work centered on a variety of scenarios in which students are charged with creating reasonable, legal, ethical, and effective solutions. A variety of learning formats are applied including written examinations, in-class group projects, a term paper, and written assignments. *Prereq. CJ U350.*
- CJ U555 Forensic Science 4 SH
Surveys various scientific approaches to examining crime scenes and crime scene evidence. Topics include the analysis of blood, hairs, fibers, bodily fluids, bones, ballistics, and DNA. Focuses on the investigation of suspicious deaths, sexual assaults, and arson.
- CJ U570 Criminal Violence 4 SH
Surveys the trends, nature, patterns, and causes of criminal violence. Blending sociological and psychological perspectives on violent criminal behavior, focuses on serial and mass murder; sexual predators; youth and school violence; and violence among intimates and family members, as well as the impact of media and entertainment violence. The effectiveness of various criminal justice responses is also examined including intervention strategies, police tactics, gun control, incarceration, and capital punishment. *Prereq. Open to non-criminal justice majors.*
- CJ U572 Youth Gangs 4 SH
Provides students with a theoretical and practical understanding of contemporary youth gangs in the United States. Covers problems in defining gangs; the nature and extent of gangs in the United States; explanations of gang formation and proliferation; variations in gang structure, function, and activities; the relationship(s) between gangs, drugs, and violence; gender, ethnic/racial, and community distinctions in gangs; and policies and programs addressing gangs (including law enforcement and prevention/intervention efforts).
- CJ U574 Organized Crime 4 SH
Examines the myths and realities surrounding organized crime. Offers an overview of the nature and extent of organized crime, the factors that contribute to it, as well as the origins and opportunities/motives for criminal enterprises. Discusses the impact of organized crime on U.S. society, both in terms of economy and politics. Also examines the interconnections between organized criminals and legitimate organizations as well as analyzes legislative and policy responses. *Prereq. Open to non-criminal justice majors.*

<p>CJ U575 Political Crime and Terrorism 4 SH Provides students an understanding of what political crime and terrorism is, the nature and extent of the problem historically and currently, as well as prevention efforts designed to combat political crime and terrorism. Students are exposed to several sources of information on political crime and terrorism including the news media, scholarly sources, and video accounts. <i>Prereq. Open to non-criminal justice majors.</i></p>	<p>CJ U660 Seminar in Juvenile Justice 4 SH Focuses on specialized advanced topic in juvenile justice to be selected by instructor. <i>Prereq. CJ U360 and junior or senior standing.</i></p>
<p>CJ U576 Corporate and White-Collar Crime 4 SH Introduces students to a variety of topics and issues in the areas of white-collar and corporate crime. Examines corporate and white-collar offending through the criminal justice and regulatory justice systems, beginning with detection and prosecution through adjudication and sentencing. A variety of special topics are also covered such as definitional issues, the nature and extent of white-collar crimes, measurement, crime types, case studies, and the etiology of offending. <i>Prereq. Open to non-criminal justice majors.</i></p>	<p>CJ U677, CJ U678, CJ U679 1 SH each Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>
<p>CJ U578 Victims of Crime 4 SH Examines current theories and research relating to victims of crime. Pays particular attention to special victim groups such as children, the elderly, and women. Explores victim interactions with the criminal justice system. Current victim initiatives such as restitution, mediation, compensation, and victim rights legislation are also assessed. <i>Prereq. Open to non-criminal justice majors.</i></p>	<p>CJ U680 Seminar in Research 4 SH Focuses on specialized advanced topic in research to be announced. <i>Prereq. CJ U382 and junior or senior standing.</i></p>
<p>CJ U600 Seminar in Criminal Justice 4 SH Focuses on specialized advanced topic in criminal justice to be selected by instructor. <i>Prereq. CJ U110, CJ U120, and junior or senior standing.</i></p>	<p>CJ U690 Co-op Integration Seminar 3 1 SH Continues CJ U390. Builds upon what students learned in CJ U380 and focuses on experiences and research journals from the second co-op. Students discuss their research activities and findings, and begin to do some critical thinking about the nature of organizations. The discussion in this seminar also prepares them for the third co-op experience, in which they keep journals on some other aspect of organizational culture or dynamics. The seminar is pass/fail. <i>Prereq. CJ U380.</i></p>
<p>CJ U610 Seminar in Law 4 SH Focuses on specialized advanced topic in law to be selected by instructor. <i>Prereq. CJ U110, CJ U120, and junior or senior standing.</i></p>	<p>CJ U799 Senior Capstone Seminar 4 SH Emphasizes study of organizations and organizational change, with focus on the organizations that comprise the criminal justice system and the environmental contexts in which they operate. Various theories of the structure and processes of organizations and the behavior of groups and individuals within organizations are examined to familiarize students with the different perspectives from which organizations can be studied (the bureaucratic model, the "principles of management" orientation, the human-relations approach, the human-resources approach, and systems theory). Also focuses on understanding change within organizations including a study of principles of organizational change and various approaches to planned change.</p>
<p>CJ U620 Seminar in Criminology 4 SH Focuses on specialized advanced topic in criminology to be selected by instructor. <i>Prereq. CJ U110, CJ U120, and junior or senior standing.</i></p>	<p>CJ U921 Directed Study 1 SH CJ U922 Directed Study 2 SH CJ U923 Directed Study 3 SH CJ U924 Directed Study 4 SH Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. CJ U110, CJ U120, and permission of instructor.</i></p>
<p>CJ U630 Seminar in Corrections 4 SH Focuses on specialized advanced topic in corrections to be selected by instructor. <i>Prereq. CJ U330 and junior or senior standing.</i></p>	<p>CJ U925 Senior Directed Study 1 SH Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. CJ U110 and CJ U120.</i></p>
<p>CJ U640 Seminar in Security 4 SH Focuses on specialized advanced topic in security to be selected by instructor. <i>Prereq. CJ U340 and junior or senior standing.</i></p>	
<p>CJ U650 Seminar in Policing 4 SH Focuses on specialized advanced topic in policing to be selected by instructor. <i>Prereq. CJ U350 and junior or senior standing.</i></p>	

CJ U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

CJ U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. CJ U970 and honors program participation.*

COMMUNICATION STUDIES

COLLEGE OF ARTS AND SCIENCES

CMN U100 College: An Introduction 1 SH
 Intended for freshmen in the College of Arts and Sciences. Introduces freshmen to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

CMN U101 Introduction to Communication Studies 4 SH
 Provides an overview of the principal areas and concentrations in the study of communication. Introduces the foundations of public communication, organizational communication, interpersonal communication, and media studies.

CMN U112 Public Speaking 4 SH
 Develops skills in public communication. Topics include choosing and researching a topic, organizing and delivering a speech, handling speech anxiety, listening critically, and adapting language to an audience. Offers the opportunity for students to present a series of speeches and receive advice and criticism from an audience.

CMN U220 Media, Culture, Society 4 SH
 Surveys the various media of communication. Includes radio, television, film, newspapers, magazines, and electronic communication. Explores the impact media have on culture and society and addresses some of the key issues and debates that circulate about the media and media influence. Also discusses and develops an understanding of the process of media preproduction and production including storyboarding, budgeting, and the medium requirements. *Prereq. CMN U101.*

CMN U230 Interpersonal Communication 4 SH
 Provides an overview of the theory and practice of interpersonal communication with the goal of developing the knowledge and skills to create dialogue in conversation, work through conflict, adapt to change, and establish/maintain relationships. Topics include definitions of the communication process, identity, self-disclosure, verbal and nonverbal language, listening, management of interpersonal conflict, and relational and dialogic communication. *Prereq. CMN U101.*

CMN U231 Principles of Organizational Communication 4 SH
 Surveys the communication process in complex organizations. Topics include the evolution of organizational communication, communication networks, information management, and communication climate. Analyzes case studies and teaches how to improve the quality of communication in an organization. *Prereq. CMN U101.*

CMN U277, CMN U278, CMN U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

CMN U301 Methods and Research in Communication 4 SH
 Introduces the various methods through which scholars of communication develop knowledge. Includes historical, descriptive, experimental, and ethnographic methods. Expects students to engage in individual research projects designed to increase familiarity with communication literature and to develop skills in critical writing and library research. *Prereq. CMN U101.*

CMN U302 Advertising and Promotional Culture 4 SH
 Investigates our promotional culture through a close study of advertising's history and contemporary industry. By analyzing advertising's production of meaning from storyboard to the complete campaign, the course develops an understanding of the interlinkages among advertising, publicity, promotion, and publications. *Prereq. CMN U220.*

CMN U303 Global and Intercultural Communication 4 SH
 Studies the patterns of globalization in media and communication, in terms of cultural integration, international production and distribution, and cultural sovereignty. Examines how these communication patterns intersect with issues of community, ethnicity, and race, both locally and internationally. *Prereq. CMN U101 and sophomore standing or above.*

CMN U304 Communication and Gender 4 SH
 Presents a theoretical and practical examination of the differences in communication between men and women in a variety of contexts. Integrates into this analysis how media affects our understanding of gender roles. *Prereq. CMN U101 and sophomore standing or above.*

- CMN U310 Classical Age of Speech and Rhetoric 4 SH
Reviews the foundations of the field of speech and communication in ancient Greece and Rome. Topics include Aristotle's ideas about persuasion, the sophistic tradition, the rhetorical theories of Cicero and Quintilian, and famous speeches of the golden age of Greece and Rome. *Prereq. CMN U101 and sophomore standing or above.*
- CMN U311 Argumentation and Debate 4 SH
Introduces the principles and skills of effective argument. Topics include the process of advocacy, how to develop an argument through reasoning, the psychology of argument, and motivational techniques of argumentation. Combines theory and practice in argument through individual presentations and team debates. *Prereq. CMN U112.*
- CMN U312 Voice and Articulation 4 SH
Provides training in developing clear and articulate speech. Topics include the physiology of the vocal mechanism, voice projection and variety, articulation and pronunciation, and appropriate speech. Trains students through lectures, drills, and exercises. *Prereq. CMN U101 and CMN U112.*
- CMN U320 Theories of Media and Culture 4 SH
Overviews key conceptual approaches that have developed for the study of the media. Investigates these theories that address the role of media in culture and focuses on how cultural studies can inform our reading of both media and culture. *Prereq. CMN U220.*
- CMN U321 Television: Text and Context 4 SH
Introduces students to critical television studies. Examines television as a meaning-producing medium by focusing upon its images and representations as they have shifted from the inception of television to the present. Students analyze its uses of image, music, graphics, editing, sound, narrative and non-narrative structure, and genres. Allows students to use various critical methods in their analysis of television: semiotics, narrative, genre, feminist, reader response, ideological, and cultural studies. Consideration is placed upon changes in the industry and viewing practices as a result of cable, satellite, and Internet technologies. *Prereq. CMN U220.*
- CMN U322 Popular Music as Media Form 4 SH
Analyzes the social forces, technological advances, and cultural influences that have contributed to the development of U.S. popular music, from early Tin Pan Alley to the present. Popular music is treated as a facet of commercial mass culture, as a profoundly influential communicative medium, and as an indicator and amplifier of broader social changes. *Prereq. CMN U220.*
- CMN U401 Advertising Principles and Practices 4 SH
Examines the development, procedures, economic functions, and responsibilities of advertising; explores planning, research, production, and other elements that go into successful advertising. Covers the preparation of advertising for print and broadcast media including campaign planning, space and time buying, and scheduling. Includes product research, consumer surveys, and how to measure the effects of advertising. *Prereq. CMN U302.*
- CMN U402 Presentation, Style, and Professional Communication 4 SH
Designed to develop students' understanding and skills in presentation beyond public speaking. The integration of display technologies to accompany talks and presentations is expanded in this course. Comprises further conceptual and applied work on matching institutional objectives to presentation and presentation goals. *Prereq. CMN U101 and CMN U112.*
- CMN U410 Rhetorical Theory and Criticism 4 SH
Reviews notable orations of the past three centuries, emphasizing contemporary speeches. Topics include the nature of criticism, the role of the critic, theories of speech analysis, and genres of oratory including inaugural speeches, apologies, nomination acceptance addresses, and political movement oratory. *Prereq. CMN U101 and CMN U112.*
- CMN U420 Audio Production 4 SH
Introduces the principles and practices of audio production. Drawing on material covered in CMN U220, emphasizes the role of preproduction in the development of various audio formats. Also features hands-on production in a variety of settings. Topics include writing and adapting scripts, program design, field- and studio-based recording techniques, and postproduction procedures. Students produce material such as public service announcements (PSAs), radio advertisements, feature stories, and radio drama. *Prereq. CMN U220.*
- CMN U421 Sports Broadcasting 4 SH
Develops and refines skills in the art of sportscasting. Students are given a historical perspective and a state-of-the-art analysis. Emphasis is on practical development of skills and evaluation of talent and potential. Areas of study include play-by-play announcing, interviewing, reporting, writing, and anchoring. *Prereq. CMN U420.*
- CMN U422 Media Audiences 4 SH
Explores how mass media audiences interpret and actively use media messages and products as listeners, readers, and consumers. Examines the different stages of ethnographic research, audience meanings and interpretations, pleasure and fandom, the role of media in everyday life, and the use of ethnographic research methods in communication studies. *Prereq. CMN U220.*

- CMN U423 Foundations of Electronic Media 4 SH
Surveys the history and development of electronic media. Designed to familiarize students with the technologies of radio, television, and computer-mediated communication. Provides students with a greater understanding of the regulatory mechanisms, industry practices, and social-political factors that determine electronic media forms and content. Special emphasis is placed on the convergence of once-discrete technologies and the creation of a new media environment. *Prereq. CMN U220.*
- CMN U424 Broadcasting Management and Programming 4 SH
Designed to familiarize students with the business side of the media. Examines the competitive structure of the radio, TV, and cable marketplace at both the network and local level. Students also examine programming practices, ratings, and regulations. *Prereq. CMN U220.*
- CMN U477, CMN U478, CMN U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- CMN U510 Persuasion in Contemporary Culture 4 SH
Teaches students to be more astute receivers and producers of persuasive messages by learning how to dissect them. Examines both classical and contemporary theories of persuasion, after which students consider “persuasion in action”—how persuasion is used in everyday language, nonverbal communication, sales techniques, politics, and propaganda. Ethical issues in persuasion are addressed throughout the course. *Prereq. CMN U410.*
- CMN U511 Oral Interpretation of Literature 4 SH
Engages students in the discovery of varied and culturally diverse texts in the literary genres of poetry, prose, and drama. Students focus on analyzing an author’s meaning and communicating that meaning to an audience through interpretive performance. *Prereq. CMN U101 and CMN U112.*
- CMN U520 TV Field Production 4 SH
Offers advanced training in video production techniques, emphasizing remote location shooting. Includes location scouting, production budgets, writing techniques, equipment location, postproduction editing, and content analysis. Offers the opportunity to work in teams to produce and direct television using remote video equipment. *Prereq. CMN U420 and permission of instructor.*
- CMN U530 Communication and Quality of Life 4 SH
Explores the process of “communicating” as an ongoing process of collaborative meaning making between people and as influenced by trends and media. Attention is given to the role of culture, identity, and conceptions of public/private in relationships and in interpersonal communication events. *Prereq. CMN U230.*
- CMN U531 Advanced Organizational Communication 4 SH
Examines the problems of sending and receiving information in complex organizations. Reviews technologies used to disseminate information, communication auditing processes, and methods to devise and assess communication programs for organizations. *Prereq. CMN U231.*
- CMN U532 Theories of Conflict and Negotiation 4 SH
Explores both theories of conflict and potential strategies for more effectively managing conflict in a variety of contexts, that is, interpersonal relationships, organizational settings, and broader societal contexts. Offers students the opportunity to participate in the process of conflict assessment and to explore various negotiation strategies as well as discuss the role of forgiveness in conflict situations. *Prereq. CMN U231.*
- CMN U533 Consultation Skills 4 SH
Designed to introduce students to both the content and process of communication consulting including theoretical frameworks to guide a broad range of consulting activities (such as management consulting and training and development), opportunities for students to investigate the field of consulting (including current trends and emerging issues), and participation in consulting activities (such as case studies and training activities). *Prereq. CMN U231.*
- CMN U534 Group Communication 4 SH
Instructs in small-group decision-making processes, problem solving, and the interpersonal dynamics of groups. Develops skills in working with and in a variety of small groups. Topics include communication dynamics, systems thinking, dialog, conflict management, leadership, power, teams, and learning organizations. *Prereq. CMN U230 and CMN U231.*
- CMN U601 Discourse Analysis 4 SH
Explores contemporary theories of language and discourse such as the discourse of gender, the discourse of corporatism, or the discourse of technology, which work to define and delimit the world in ways consistent with dominant political and economic interests. *Prereq. CMN U320, CMN U410, and 64 SH toward degree, or junior or senior standing.*
- CMN U610 Political Communication 4 SH
Explores the construction and influence of rhetoric used by political candidates and officeholders within their campaigns and the community. Also examines the counter rhetoric of challengers and opposing groups, as well as the impact of the media, constructions of gender, negotiation of marginality, and related legislation. *Prereq. CMN U410.*
- CMN U620 Television Studio Production 4 SH
Covers the creative and technical elements of video production, camera operation, floor direction, graphics editing, lighting, picture composition, and directing methods. *Prereq. CMN U520.*

- CMN U621 Digital Editing for TV 4 SH
Addresses the changes in editing practices through digitization and offers students advanced training in nonlinear editing utilizing the Avid Media Composer. *Prereq. CMN U620 and Macintosh experience and permission of instructor.*
- CMN U622 New Media Culture 4 SH
Investigates the emerging media technologies such as the Internet, the World Wide Web, and video and computer games. In its study of media and technological convergence, the course develops the critical skills both to comprehend these new forms of communication and intervene in their use and production. *Prereq. CMN U320.*
- CMN U630 Assessment Technique and Planning 4 SH
Centers on creating and administering diagnostic tools used to assess the quality of communication in organizations. Students review measurement techniques, test organizational communication quality in simulated situations, and design programs intended to improve the quality of communication in organizations. *Prereq. CMN U531.*
- CMN U631 Crisis Communication and Image Management 4 SH
Examines how organizations communicate to internal and external audiences in times of crisis. Explores methods of preparing for such crises, how to identify internal and external stakeholders, and how to reach these audiences. Case studies are used to analyze how other organizations have successfully and unsuccessfully responded to crises. *Prereq. CMN U231.*
- CMN U677, CMN U678, CMN U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- CMN U699 Advanced Television Production 4 SH
Provides students with guidance in the development of special projects in television and video production. Studies include advanced directing (studio and field), lighting, scriptwriting, editing, graphics, and postproduction technology. *Prereq. CMN U101 and permission of instructor.*
- CMN U901 Senior Seminar in Communication 4 SH
Integrates students' experiences in cooperative education with classroom concepts and theories. Topics include integrative learning, the field of communication, pathways and careers in communication, and the professional communicator. Offers students the opportunity to demonstrate competency in communication skills such as oral reporting, conducting research in communication, and writing. *Prereq. Senior standing, co-op, and permission of instructor.*
- CMN U910 Special Topics in Public Communication 4 SH
Addresses specialized work and practices in public communication. Course content may vary from year to year. *Prereq. CMN U310.*
- CMN U912 Special Topics in Media Studies 4 SH
Addresses issues in communication and media as well as developments in the production of television and video. Course content may vary from year to year. *Prereq. CMN U220.*
- CMN U914 Special Topics: Organizational Communication 4 SH
Addresses specific and/or specialized issues in organizational communication. Course content may vary from year to year. *Prereq. CMN U231.*
- CMN U916 Organizational Communication Practicum 4 SH
Focuses on internal newsletters, department brochures, and electronic and conventional bulletin boards, some of the methods that organizations use to communicate with their internal audiences. This practicum requires that students serve as designers and creators of communication instruments to be used in the Department of Communication Studies. Interested students must complete an application in the department office. *Prereq. CMN U531, senior standing, and permission of instructor.*
- CMN U921 Directed Study 1 SH
- CMN U922 Directed Study 2 SH
- CMN U923 Directed Study 3 SH
- CMN U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. CMN U101 and permission of instructor.*
- CMN U944 Internship in Communication 4 SH
Offers students the opportunity to gain hands-on experience in the communications industry. Further internship details are available in the department office. *Prereq. CMN U101, junior or senior standing, and permission of instructor.*
- CMN U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*
- CMN U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. CMN U970 and honors program participation.*

COOPERATIVE EDUCATION

- COP U101 Professional Development for Co-op 1 SH
Introduces students to co-op. Covers résumé writing, interviewing skills, and the "how-tos" of co-op. *Prereq. CBA students only.*

COP U120 Working in the United States	4 SH
Helps international students compete more effectively for cooperative education positions in the United States and assists them in their cultural transition into the U.S. workforce. Considers work-oriented cross-cultural issues, American work practices, skills development, résumé writing, and interviewing techniques.	
COP U180 Career Decision Making	4 SH
Focuses on needs and concerns of students who are undecided or uncertain about their academic major or career direction. Students identify their work values, interests, skills, and personality preferences as these relate to choice of major and career options. Provides students with the opportunity to explore various careers through researching in the Career Resource Center, conducting informational interviews with professionals in their fields of interest, and using the Internet. Discusses how labor market trends and workplace issues impact career choice. Emphasizes decision-making and goal-setting strategies. <i>Prereq. Freshman and sophomore standing.</i>	
COP U181 Career Decision Making	1 SH
Focuses on needs and concerns of students who are undecided or uncertain about their academic major or career direction. Introduces students to self-assessment and career exploration through individual and group exercises, class activities, and research. Includes individual appointments with the instructor. <i>Prereq. Freshman and sophomore standing.</i>	
COP U301 Co-op Reflection Seminar	1 SH
Provides students an opportunity for shared constructive reflection on the work experience.	
COP U314 Life/Career Planning	4 SH
Assists students with the transition from school to the workplace. Students identify their career interests and values, and assess skills and personality preferences to help them make better career decisions. Emphasizes labor market issues, job search techniques, networking, and career management issues. Prepares students for the job search process by requiring them to complete a professional résumé, participate in videotaped mock interviews, and research companies. <i>Prereq. Senior standing or permission of instructor.</i>	
COP U906 Co-op Experience	6 SH
Provides students an opportunity for work experience.	
COP U910 Co-op Exchange	0 SH
Provides students an opportunity for work experience.	
COP U912 Co-op Experience	12 SH
Provides students an opportunity for work experience.	

COMPUTER SCIENCE

COLLEGE OF COMPUTER AND INFORMATION SCIENCE

CS U101 Computer Science and Its Applications	4 SH
Introduces students to the field of computer science and the patterns of thinking that enable them to become intelligent users of software tools in a problem-solving setting. Examines several important software applications so that students may develop the skills necessary to use computers effectively in their own disciplines. <i>Coreq. CS U102. Prereq. Not for computer or information science majors.</i>	
CS U102 Computer Science Applications Lab	0 SH
Accompanies CS U101. Covers problem solving with software applications. <i>Coreq. CS U101. Prereq. Not for computer or information science majors.</i>	
CS U200 Discrete Structures	4 SH
Introduces the mathematical structures and methods that form the foundation of computer science. Studies structures such as sets, tuples, sequences, lists, trees, and graphs. Discusses functions, relations, ordering, and equivalence relations. Examines inductive and recursive definitions of structures and functions. Discusses principles of proof such as truth tables, inductive proof, and basic logic. Also covers the counting techniques and arguments needed to estimate the size of sets, the growth of functions, and the space-time complexity of algorithms.	
CS U211 Fundamentals of Computer Science 1	4 SH
Introduces the fundamentals of computer science by describing the functional and object-oriented styles of programming, examining basic sequential and recursive algorithms, and studying linear data structures including arrays and linear collection classes such as vectors, stacks, queues, and lists. Discusses elementary programming patterns. Presents techniques for the creation of simple graphical user interfaces. Applies these ideas to sample applications that illustrate the breadth of computer science.	
CS U212 Fundamentals of Computer Science 2	4 SH
Continues CS U211. Examines object-oriented programming and associated algorithms using more complex data structures as the focus. Discusses nested structures and nonlinear structures including hash tables, trees, and graphs. Emphasizes abstraction, encapsulation, inheritance, polymorphism, recursion, and object-oriented design patterns. Applies these ideas to sample applications that illustrate the breadth of computer science. <i>Prereq. CS U211; CS U200 should be taken prior to or concurrently with CS U212.</i>	
CS U215 Algorithms and Data Structures for Engineering	4 SH
Introduces algorithms and data structures for engineering students. Discusses data structures such as arrays, stacks, queues, and lists, and the algorithms that manipulate these structures. Introduces simple algorithm analysis. Discusses classes and objects and presents the basic material about encapsulation, inheritance, and polymorphism. Introduces	

software development practices such as modular design, use of libraries, testing methods, and debugging techniques.

Prereq. GE U111 and restricted to engineering majors.

CS U221 Computer/Information Science Overview 1 1 SH

Introduces new students to computer and information science as a profession. Develops academic and career success skills such as time management, organizational skills, professional skills, and interpersonal skills. *Prereq. Intended for CS/IS freshmen or freshmen who will transfer into CS/IS.*

CS U222 Computer/Information Science Overview 2 1 SH

Continues CS U221. Prepares students for co-op through topics such as ethics, privacy, security, responsibility, and intellectual property. Exposes students to popular industry technologies. *Prereq. Intended for CS/IS freshmen or freshmen who will transfer into CS/IS.*

CS U223 Computer/Information Science Co-op Preparation 1 SH

Prepares students for co-op through topics such as ethics, privacy, security, responsibility, and intellectual property. Exposes students to popular industry technologies. *Prereq. Intended for transfer students into CS/IS who are above the freshman level.*

CS U231 Honors Freshman Seminar 1 1 SH

Introduces a variety of topics that extend the material in the standard freshman computer courses or go beyond the scope of these courses. *Coreq. CS U211. Prereq. Restricted to honors freshman majors in CS/IS.*

CS U232 Honors Freshman Seminar 2 1 SH

Introduces a variety of topics that extend the material in the standard freshman computer courses or go beyond the scope of these courses. *Coreq. CS U212. Prereq. Restricted to honors freshman majors in CS/IS.*

CS U277, CS U278, CS U279 1 SH each
Honors Adjunct

Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

CS U370 Object-Oriented Design 4 SH

Presents a comparative approach to object-oriented programming and design. Discusses the concepts of object, class, meta-class, message, method, inheritance, and genericity. Reviews forms of polymorphism in object-oriented languages. Contrasts the use of inheritance and composition as dual techniques for software reuse such as forwarding vs. delegation and subclassing vs. subtyping. Fosters a deeper understanding of the principles of object-oriented programming and design including software components, object-oriented design patterns, and the use of graphical design notations such as UML (unified modeling language). Basic concepts in object-oriented design are illustrated with case studies in application frameworks and by writing programs in one or more object-oriented languages. *Prereq. CS U212.*

CS U380 Computer Organization 4 SH

Introduces the basic design of computing systems. Covers central processing unit (CPU), memory, input, and output. Provides a complete introduction to assembly language such as the basics of an instruction set plus experience in assembly language programming using a RISC architecture. Uses system calls and interrupt-driven programming to show the interaction with the operating system. Covers machine representation of integers, characters, and floating-point numbers. Describes caches and virtual memory. *Prereq. CS U212.*

CS U390 Theory of Computation 4 SH

Introduces the theory behind computers and computing aimed at answering the question, "What are the capabilities and limitations of computers?" Covers automata theory, computability, and complexity. The automata theory portion includes finite automata, regular expressions, nondeterminism, nonregular languages, context-free languages, pushdown automata, and noncontext-free languages. The computability portion includes Turing machines, the Church-Turing thesis, decidable languages, and the Halting theorem. The complexity portion includes big-O and small-o notation, the classes P and NP, the P vs. NP question, and NP-completeness. *Prereq. CS U212 and PHL U215.*

CS U430 Database Design 4 SH

Studies the design of a database for use in a relational database management system. The entity-relationship model and normalization are used in problems. Relational algebra and then the SQL (structured query language) are presented. Advanced topics include triggers, stored procedures, indexing, elementary query optimization, and fundamentals of concurrency and recovery. Students implement a database schema and short application programs on one or more commercial relational database management systems. *Prereq. CS U212.*

CS U477, CS U478, CS U479 1 SH each
Honors Adjunct

Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

CS U480 Systems and Networks 4 SH

Introduces the basic concepts underlying computer operating systems and computer networks and provides hands-on experience with their implementation. Covers the basic structure of an operating system such as application interfaces, processes, threads, synchronization, interprocess communication, processor allocation, deadlocks, memory management, file systems, and input/output control. Also introduces network architectures, network topologies, network protocols, layering concepts (for example, ISO/OSI, TCP/IP reference models), communication paradigms (point-to-point vs. multicast/broadcast, connectionless vs. connection oriented), and networking APIs (sockets). Uses examples from many real operating systems and networks (UNIX, MS-DOS, Windows, TCP/IP, Ethernet, ATM, and token rings) to reinforce concepts. *Prereq. CS U380.*

<p>CS U520 Artificial Intelligence 4 SH Introduces the fundamental problems, theories, and algorithms of the artificial intelligence field. Includes heuristic search; knowledge representation using predicate calculus; automated deduction and its applications; planning; and machine learning. Additional topics include game playing; uncertain reasoning and expert systems; natural language processing; logic for common sense reasoning; ontologies; and multiagent systems. <i>Prereq. CS U212 and PHL U215.</i></p>	<p>CS U665 Compilers 4 SH Studies the construction of compilers and integrates material from earlier courses on programming languages, automata theory, computer architecture, and software design. Examines syntax trees; static semantics; type checking; typical machine architectures and their software structures; code generation; lexical analysis; and parsing techniques. Uses a hands-on approach with a substantial term project. <i>Prereq. CS U380 and CS U660.</i></p>
<p>CS U540 Computer Graphics 4 SH Charts a path through every major aspect of computer graphics with varying degrees of emphasis. Discusses hardware issues such as size and speed; lines, polygons, and regions; modeling, or objects and their relations; viewing, or what can be seen (visibility and perspective); rendering, or how it looks (properties of surfaces, light, and color); transformations, or moving, placing, distorting, and animating; and interaction, or drawing, selecting, and transforming. <i>Prereq. CS U212 and MTH U371.</i></p>	<p>CS U670 Software Development 4 SH Considers software development as a systematic process involving specification, design, documentation, implementation, testing, and maintenance. Examines software process models; methods for software specification; modularity, abstraction, and software reuse; and issues of software quality. Students, possibly working in groups, design, document, implement, test, and modify software projects. <i>Prereq. CS U370 and CS U390.</i></p>
<p>CS U600 Senior Seminar 1 SH Requires students to give a twenty- to thirty-minute formal presentation on a topic of their choice in computer science. Prepares students for this talk by discussing methods of oral presentation, how to present technical material, how to choose what topics to present, overall organization of a talk, and use of presentation software and other visual aids. <i>Prereq. Senior standing in CS or permission of instructor.</i></p>	<p>CS U677, CS U678, CS U679 1 SH each Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>
<p>CS U610 Honors Senior Seminar 4 SH Offers a capstone course for computer science honors students. Exposes students to one or more topics of current interest in computer science. Requires students to prepare a one-hour presentation on a topic in computer science and to write a paper on that topic. <i>Prereq. Honors senior standing in CS or permission of instructor.</i></p>	<p>CS U680 Topics in Operating Systems 4 SH Studies advanced concepts underlying computer operating systems and computer networks. Examines in depth all major operating system and network components including device drivers, network protocol stacks, memory managers, centralized and distributed file systems, interprocess communication mechanisms, real-time schedulers, and security mechanisms. Additional components are covered as time permits. Provides hands-on experience with the source code of commercial-grade operating systems and networks. <i>Prereq. CS U480.</i></p>
<p>CS U650 Topics in Computer Networks 4 SH Introduces the underlying concepts and principles of computer networks with emphasis on the Internet architecture and protocols. Details the design and implementation of network protocols that compose a fully functional communication system. Discusses protocol concepts including encoding and framing; reliable transmission; packet forwarding and routing; and flow and congestion control. Architectural considerations focus on protocol interactions and the functionality/performance trade-off. Includes a comparative discussion on the performance evaluation of communication systems highlighting different goals, metrics, and perspectives. Also covers application protocols and applications such as electronic mail and the World Wide Web. <i>Prereq. CS U480.</i></p>	<p>CS U690 Algorithms and Data 4 SH Introduces the basic principles and techniques for the design, analysis, and implementation of efficient algorithms and data representations. Discusses asymptotic analysis and formal methods for establishing the correctness of algorithms. Considers divide-and-conquer algorithms, graph traversal algorithms, and optimization techniques. Introduces information theory and covers the fundamental structures for representing data. Examines flat and hierarchical representations, dynamic data representations, and data compression. Concludes with a discussion of the relationship of the topics in this course to complexity theory and the notion of the hardness of problems. <i>Prereq. CS U370 and CS U390.</i></p>
<p>CS U660 Programming Languages 4 SH Introduces a systematic approach to understanding the behavior of programming languages. Covers interpreters; static and dynamic scope; environments; binding and assignment; functions and recursion; parameter-passing and method dispatch; objects, classes, inheritance, and polymorphism; type rules and type checking; and concurrency. <i>Prereq. CS U370 and CS U390.</i></p>	<p>CS U700 Computer Science Thesis 4 SH Focuses on student preparing an undergraduate thesis under faculty supervision. <i>Prereq. Junior or senior standing with permission of instructor and undergraduate committee.</i></p>

CS U701 Computer Science Thesis Continuation 4 SH
Focuses on student continuing to prepare an undergraduate thesis under faculty supervision. *Prereq. CS U700 and permission of instructor and undergraduate committee.*

CS U900 Computer Science Topics 4 SH
Offers a lecture course in computer science on a topic not regularly taught in a formal course. Topics may vary from offering to offering. *Prereq. CS U370, CS U380, CS U390, and permission of instructor; may take three times for credit with permission of undergraduate committee.*

CS U910 Computer Science Project 4 SH
Focuses on student developing a substantial software or hardware artifact under faculty supervision. *Prereq. 64 SH toward degree and permission of instructor and undergraduate committee; may repeat three times for credit.*

CS U921 Directed Study 1 SH

CS U922 Directed Study 2 SH

CS U923 Directed Study 3 SH

CS U924 Directed Study 4 SH

Focuses on student examining standard computer science material in fresh ways or new computer science material that is not covered in formal courses. *Prereq. CS U370, CS U380, CS U390, and permission of instructor; maximum 12 credits in CS/IS directed study.*

CS U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

CS U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. CS U970 and honors program participation.*

ELECTRICAL AND COMPUTER ENGINEERING

COLLEGE OF ENGINEERING

ECE U210 Electrical Engineering 4 SH
Introduces the basic concepts related to circuits and circuit elements; current, voltage, and power; models for resistors, capacitors, and inductors; and circuit analysis using Kirchhoff's laws. Discusses selected topics that illustrate a variety of applications of electrical engineering, such as AC circuits and electric power, the basics of semiconductor devices with applications to transistor amplifier models, transients in circuits with energy storage, mechanical controls and mechatronics, digital

signals, logic circuits, and some basic concepts of computer operations, specifically number coding, arithmetic operations, and memory circuits. *Coreq. ECE U211. Prereq. MTH U242.*

ECE U211 Lab for ECE U210 1 SH
Accompanies ECE U210. Covers fundamental DC and AC electrical concepts, analog and digital electronics, and robotics. *Coreq. ECE U210.*

ECE U230 Computer Architecture for Computer Scientists 4 SH
Provides an in-depth look at the current state of computer architecture. Presents a number of commercial instruction-set architecture and design tradeoffs. Emphasizes the cost/performance decisions that drive today's microprocessor implementations; covers the design of full systems including the memory hierarchy; and examines the supporting bussing and I/O subsystems. Topics include performance analysis, pipelining, control and data prediction, compiler organization, super-scalar and VLIW execution, virtual memory, bus protocols, and parallel processing. Emphasizes how compilers and computer architectures work in tandem to produce high-performance execution. *Prereq. Not open to ECE majors.*

ECE U277, ECE U278, ECE U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ECE U300 Introduction to Engineering Co-op Education 1 SH
Provides students preparation for the first co-op experience. Focuses on skills that provide a basis for successful co-op engagement including expectations and requirements, an introduction to professional credentials, résumé construction, self-assessment and goal setting, interviewing, professional and co-op ethics, issues of diversity in the workplace community, academic planning and decision making, and an introduction to career portfolios. *Prereq. GE U100.*

ECE U322 Digital Logic Design 4 SH
Discusses the implementation of digital systems at the logic gate level. Covers Boolean logic, logic minimization, combinational design, sequential circuits, state machines, data path design, and finite-state machine design. Students use computer-aided logic design tools to design and simulate circuits. Hardware description languages are introduced as a design entry method for describing digital circuits. *Coreq. ECE U323.*

ECE U323 Lab for ECE U322 1 SH
Accompanies ECE U322. Introduces aspects of the design of digital hardware including a digital calculator or design of similar complexity. Covers skills including combinational logic, sequential logic, and finite-state machine design. Students use computer-aided logic design tools and field-programmable logic to implement their designs. *Coreq. ECE U322.*

<p>ECE U324 Computer Architecture and Organization 4 SH Introduces the organization and architecture of computer systems. Describes the structure and function of the data path and control hardware, and the implementation of an assembly language instruction set using register-transfer statements. Offers students the opportunity to program using assembly language and to use simulators and debugging tools. Covers the architecture of modern high-performance processors including caching, memory management, I/O, pipelining, superscalar execution, and storage systems. Emphasizes the impact of compilers and computer architecture on system performance. <i>Prereq. ECE U322.</i></p>	<p>ECE U402 Electronics 4 SH Introduces the methods of design and analysis of modern electronic circuits. Develops the operation of the principal semiconductor devices such as diodes, field-effect transistors, and bipolar junction transistors. Focuses on using large- and small-signal models to understand the behavior of transistors as amplifiers and switches. Analog electronics topics include the frequency response of transistor amplifiers and the use of cascaded amplifiers to increase gain and bandwidth; and digital electronics including NAND and NOR CMOS logic gates, dynamic power dissipation, gate delay, and fan-out are covered. <i>Coreq. ECE U403. Prereq. ECE U210 or ECE U400.</i></p>
<p>ECE U326 Optimization Methods 4 SH Covers optimization techniques with applications to problems that arise in electrical and computer engineering. Bridges the gap between theoretical study of algorithms and their application to the solution of applied optimization problems. Studies how to model an applied engineering problem as an abstract optimization problem and to use powerful optimization techniques to solve it. Techniques include divide and conquer, backtracking, local optimization, dynamic programming, branch-and-bound, simulated annealing, genetic algorithms, and greedy algorithms. Emphasizes the use of existing tools and optimization packages to solve these problems. <i>Prereq. CS U215.</i></p>	<p>ECE U403 Lab for ECE U402 1 SH Accompanies ECE U402. Includes experiments such as characterization of diodes, BJTs, and MOSFETS. Allows students to design such circuits as multistage amplifiers and photoswitches. Includes experiments using integrated-circuit current mirrors, differential amplifiers, frequency response, and feedback. <i>Coreq. ECE U402.</i></p>
<p>ECE U400 Linear Circuits 4 SH Introduces the basic laws and basic signal and device models used in the study of linear circuits. Topics include basic circuit analysis with resistive networks including node-voltage and mesh-current analysis, and the Thevenin and Norton theorems. Introduces three-terminal and dependent source models including the ideal operational amplifier model. Discusses common signal models including step functions, and the analysis of first- and second-order circuits and the solution of related differential equations. Presents the unilateral Laplace transform as a technique for solving differential equations with initial conditions that model linear circuit behavior, and introduces Laplace transform equivalent circuit models. Introduces frequency-domain circuit analysis and s-domain analysis including pole/zero plots and frequency response. Considers circuits in the sinusoidal steady state using phasor representation. <i>Prereq. MTH U343 and PHY U155.</i></p>	<p>ECE U440 Electromagnetic Fields and Waves 4 SH Introduces electromagnetics and high-frequency applications. Topics include transmission line model with distributed circuit elements, transmission line equations and solutions, one-dimensional traveling and standing waves, and applications. Covers Lorentz force equations, Maxwell's equations, and Poynting theorem and application to the transmission line's TEM waves. Also studies uniform plane wave propagation along a coordinate axis and along an arbitrary direction; equivalent transmission lines for TEM, TE, and TM waves; reflection and refraction of uniform plane waves by conducting and dielectric surfaces. Discusses applications to wave guides, resonators, and optical fibers, and radiation and elementary antennas. Introduces modern techniques (computational methods) and applications (optics, bioelectromagnetics, and electromagnetic effects in high-speed digital circuits). <i>Coreq. ECE U441. Prereq. MTH U341 and PHY U155.</i></p>
<p>ECE U401 Introduction to Electronic Engineering Lab 1 SH Provides a hands-on introduction to electronic circuits, devices, measurement techniques, and simulation studies. Emphasis is on active learning by doing. Students design, assemble, and test a working electronic system and perform simulations to study electrical engineering concepts related to this system. Transient response of RC and RLC circuits; op amps; and passive and active filters are studied. <i>Prereq. GE U111 and PHY U155 or equivalent.</i></p>	<p>ECE U441 Lab for ECE U440 1 SH Accompanies ECE U440. Supports class material related to microwave transmission and radiation and optics. Experiments include microwave transmission line measurements and the determination of the properties of dielectric materials; transmission line electrical length measurements; reflection and impedance measurements of dipole antennas; frequency characteristics of antennas and wave-guides; antenna mutual coupling; radiation pattern determination; S-parameters; and geometrical optics and refraction. <i>Coreq. ECE U440.</i></p>
	<p>ECE U464 Linear Systems 4 SH Develops the basic theory of continuous and discrete systems, with emphasis on linear time-invariant systems. Discusses the representation of signals and systems in both the time and frequency domain. Topics include linearity, time-invariance, causality, stability, convolution, system interconnection, and sinusoidal response. The Fourier and Laplace transforms are</p>

developed for the discussion of frequency-domain applications. Sampling and quantization of continuous waveforms (A/D and D/A conversion) are analyzed, leading to the discussion of discrete-time FIR and IIR systems, recursive analysis, and realization. The Z-transform and the discrete-time Fourier transform are developed, and applied to the analysis of discrete-time signals and systems. *Coreq. ECE U465. Prereq. ECE U400 and MTH U343.*

ECE U465 Lab for ECE U464 1 SH
Accompanies ECE U464. Consists of experiments that are closely integrated with ECE U464. The experiments are designed to aid the student in obtaining a deeper physical understanding of the signal and system theory concepts and applications. *Coreq. ECE U464.*

ECE U468 Noise and Stochastic Processes 4 SH
Discusses the physical origins of noise and models for its analysis in electronic devices, analog and digital systems, and communications. The basic theory of discrete and continuous probability, correlation, covariance, and power density spectra is developed and used to discuss random variables and stochastic processes, with application to the analysis of signals in the presence of noise in analog and digital systems. *Prereq. ECE U464.*

ECE U477, ECE U478, ECE U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ECE U500 Professional Issues in Engineering 1 SH
Provides students with an opportunity to reflect on both academic and co-op experiences in the context of planning for the senior year and beyond. Issues include professional and ethical issues; resolving ethical conflicts; awareness of engineers as professionals in a diverse world; strengthening decision-making skills; career portfolios; and lifelong learning needs, goals, and strategies. Students reflect upon issues of diversity from their experience in the University and in their cooperative education placements. Explores the role of different work and learning styles and diverse personal characteristics on the workplace and the classroom. Professional issues include impact of the cultural context, both in the United States and around the world, of the client, government relations, and workplace. *Prereq. Junior or senior standing.*

ECE U512 Biomedical Electronics 4 SH
Provides an overview of bioelectrical signals and their processing. Topics include electrode interfaces to biological organisms, conditioning of bioelectrical signals, and safety considerations for electronic equipment used for medical applications. *Prereq. ECE U210 or ECE U402.*

ECE U520 Software Engineering 1 4 SH
Provides an overview of the main concepts in software engineering, the software process, methods, techniques, and tools. Topics include requirements analysis and specification, software design, coding, testing, and maintenance, verification, validation, and documentation. Covers structured analysis and object-oriented design methodologies. Presents overviews of user interface design, prototyping, CASE tools, software metrics, and software development environments. Includes a small software development project. *Prereq. CS U215.*

ECE U522 Software Engineering 2 4 SH
Continues ECE U520. Provides an overview of principles, methods, and techniques for describing how a software product is implemented so that its requirements are satisfied. Examines the fundamental building blocks and patterns for construction of software systems in the context of a sound design process. Topics include patterns of design, principles of modularity, architectural design, component design, data design, algorithm design, graphical user interfaces, documentation, case studies, and standards. *Prereq. ECE U520.*

ECE U524 VLSI Design 4 SH
Emphasizes several topics that are essential to the practice of VLSI design as a system design discipline including systematic design methodology, good understanding of CMOS transistor, physical implementation of combinational and sequential logic network, and physical routing and placement issues. Begins design exercises and tutorials with basic inverters and proceeds to the design, verification, and performance of large complex digital logic networks. Also covers IC design methodologies and performance, scaling of MOS circuits, design and layout of subsystems such as PLA and memory, and system timing. Requires lab session that includes computer exercises using CAD tools to design VLSI layouts and switch-level plus circuit-level simulations to design and analyze the project. *Coreq. ECE U525. Prereq. ECE U322 and ECE U402.*

ECE U525 Lab for ECE U524 1 SH
Accompanies ECE U524. Covers topics from the course through various experiments. *Coreq. ECE U524.*

ECE U526 High-Speed Digital Design 4 SH
Covers high-speed digital circuit design issues including signal and power integrity, capacitive and inductive coupling between the on-chip wires, high-speed properties of logic gates, and clock and power distribution issues in high-frequency digital circuit design. Examines what to model/verify, device models, MOS and wires, worst-case design, simulation methods, and margin testing. Also explores circuit families from simple static CMOS to advanced forms dealing with high-frequency and high-performance issues of those circuits. Informs about the many ways a circuit can fail and the type of modeling and testing needed to ensure that the circuit will work in production. *Prereq. ECE U322 and ECE U402.*

- ECE U528 CAD for Design and Test 4 SH
Covers the basic algorithmic principles of computer-aided design (CAD) for VLSI circuits and systems. Design topics include placement and routing; floor planning; global and detail routing techniques; and cell generation and programming structure considering the circuit performance and silicon area. Testing topics include fault modeling, automatic test generation for combinational and sequential circuits, functional approaches, design for testability, BIST (built-in self test), logic level diagnosis, and boundary scan test. *Prereq. ECE U322 and ECE U402.*
- ECE U530 Hardware Description Languages and Synthesis 4 SH
Focuses on modeling of digital systems in a hardware description language. Topics include textual vs. graphical modeling of digital systems, syntax and semantics of the VHDL language, modeling for simulation, and modeling for synthesis. Students use a commercially available CAD tool to simulate and synthesize digital system descriptions. *Prereq. ECE U322.*
- ECE U534 Microprocessor-Based Design 4 SH
Focuses on the hardware design for stand-alone devices built around a microprocessor. Topics include microprocessor-systems architecture; electrical characteristics and buffering of microprocessor busses; memory systems, memory maps, and address decoding; static and dynamic memory; timing in microprocessor systems; asynchronous and synchronous bus protocols; troubleshooting microprocessor systems; I/O-port design and interfacing using VLSI devices such as parallel and serial ports; communication protocols and synchronization to external devices such as hardware and software handshake, serial communication protocols, RS 232C, RS 422, and RS 423 serial interface standards; timers; digital-to-analog and analog-to-digital converters; exception processing and interrupt handlers such as interrupt generation, interfacing, and vectoring. *Coreq. ECE U535. Prereq. ECE U324.*
- ECE U535 Lab for ECE U534 1 SH
Accompanies ECE U534. Consists of a comprehensive laboratory performed by groups of three students. These exercises require students to design, construct, and debug hardware and software to be used with a 68000 microprocessor system. The final exercise is a project, which lets each group integrate hardware and software to make the microprocessor system implement a simple stand-alone function. *Coreq. ECE U534. Prereq. ECE U324.*
- ECE U538 Real-Time Systems 4 SH
Introduces the design and analysis of real-time systems from a top-down perspective. Covers general principles and practices, types of real-time systems, specification of system requirements, techniques for resource allocation and reservation, and features of system software to support application development. Also involves implementation and simulation of one ingredient in a real-time system, such as a scheduler. *Prereq. ECE U326 or ECE U520.*
- ECE U572 Communications Systems 1 4 SH
Covers fundamentals of digital communication and optimum receiver design for digital communication systems. Topics include source coding algorithms, Huffman coding, Lempel-Ziv algorithm, quantization, PCM, DPCM, optimal receiver design for AWGN channels, PAM, ASK, PSK, DPSK, and QAM systems, error probability computation, and comparison of digital communication systems in terms of power and bandwidth efficiency. Considers synchronization and equalization techniques. Introduces block and convolutional codes. *Prereq. ECE U468.*
- ECE U574 Wireless Communication Circuits 4 SH
Explores analog radio electronics through the design and construction of a 7 MHz radio transceiver (the NorCal 40A). Offers an overview of radio designs and components. Describes the phasor analysis of series and parallel resonant circuits. Presents transmission line concepts including phasor analysis for waves, the telegraphist's equations, dispersion, resonance, quality factor, and lines with loads. Introduces radio filter designs including ladder filters, band-pass filters, as well as filters using crystals and impedance inverters. Introduces working concepts of transformers and speakers. Describes transistor switches and Class B, C, D, E, and F amplifiers. Presents the fundamentals of oscillators and mixers. Also discusses antennas and propagation fundamentals including impedance, Friis's formula, and reciprocity. Dipole and whip antennas are used as practical examples. *Prereq. ECE U402 and ECE U440.*
- ECE U576 Wireless Personal Communications Systems 4 SH
Describes the personal communications network (PCN) and personal communications services (PCS). Examines the first-, second-, and third-generation cellular systems used in the United States, Europe, and Japan. Explores narrow-band channelized and wide-band non-channelized wireless communication systems. Focuses on access technologies considering capacity, performance, and spectral efficiency. Presents the propagation and multipath characteristics of a radio wave as well as how to calculate propagation losses in urban, suburban, and rural environments. Studies the fundamentals of cellular communications including the relationship between the reuse ratio and cluster size for hexagonal cell geometry. Covers digital modulation techniques, emphasizing modulation schemes used for cellular/wireless communications. Discusses antennas and diversity techniques. Concludes with an overview of the global system for mobile communications (GSM). *Prereq. ECE U468.*
- ECE U580 Control Systems 4 SH
Introduces the analysis and design of classical control systems. Examines control system objectives, modeling and mathematical description, transfer function and state variable representations, feedback control system characteristics, system responses, and stability of feedback systems. Also addresses compensator design based on root-locus and frequency response, and modern control system design using state variable feedback. *Coreq. ECE U581. Prereq. ECE U402 and ECE U464.*

- ECE U581 Lab for ECE U580 1 SH
Accompanies ECE U580. Covers the practical aspects of control systems design through lab experiments. Topics include analog computer simulation, digital computer control, and use of CAD packages such as MATLAB for analysis and design of control systems. Experiments with PID control emphasize classical methods of feedback compensation, and an experiment with modern techniques of state variable feedback considers digital speed control of a DC motor. *Coreq. ECE U580.*
- ECE U600 Electronic Design 4 SH
Covers op amp circuits, analog IC design concepts, feedback, oscillators, A/D and D/A converters, active filters, and other design topics at the discretion of the instructor. Extensive use is made of PSPICE simulation. *Coreq. ECE U601. Prereq. ECE U402.*
- ECE U601 Lab for ECE U600 1 SH
Accompanies ECE U600. Students prototype their designs from lecture in this open lab. *Coreq. ECE U600.*
- ECE U604 Semiconductor Device Theory 4 SH
Develops elements of solid-state theory including crystal structure, quantum theory, and carrier (electron and hole) transport theory. Uses this knowledge to model devices commonly used in modern electronic circuits, including p-n junction diodes, MOS transistors, and bipolar junction transistors. Provides preparation for advanced study in the areas of integrated circuit fabrication, VLSI design, and electronic design. *Prereq. ECE U402.*
- ECE U606 Integrated Circuit Fabrication 4 SH
Provides an overview of integrated circuit fabrication from the viewpoint of a process engineer. Students design and fabricate IC chips in integrated lab sessions. Focuses on the physics, chemistry, and technology of integrated circuit fabrication in the lecture portion of the course, while students fabricate and test MOS integrated circuits in the lab portion. Compares process and device models with experimental results during the lab sessions. Tests diodes, MOS capacitors, transistors, and logic gates. Students use the industry-standard process simulator SUPREM-IV to supplement analytical process models. Concentrates on silicon IC technology, but also discusses other material systems and microstructures including GaAs and microelectromechanical systems (MEMS). *Coreq. ECE U607. Prereq. ECE U402.*
- ECE U607 Lab for ECE U606 0 SH
Accompanies ECE U606. Covers topics from the course through various activities. *Coreq. ECE U606.*
- ECE U622 Parallel and Distributed Processing 4 SH
Covers parallel and distributed processing concepts including concurrency and its management, models of parallel computation, and synchronous and asynchronous parallelism. Topics include simple parallel algorithm formulation, parallelization techniques, interconnection networks, arrays, trees, hyper-cubes, message routing mechanisms, shared address space and message-passing multiprocessor systems, communication cost and latency-hiding techniques, scalability of parallel systems, and parallel programming concepts and application case studies. *Prereq. CS U215.*
- ECE U626 Introduction to Image Processing and Pattern Recognition 4 SH
Provides an introduction to pattern recognition methods through simple classification problems that arise in computer image processing. Topics include digital images and their properties, classification principles (Bayes rules, class boundaries), and pattern recognition methods. Studies techniques including image preprocessing, segmentation, feature extraction, object recognition, and image analysis and understanding. Discusses applications in computer vision. *Prereq. ECE U464, ECE U468, and MTH U285 or MTH U481.*
- ECE U628 Computer and Telecommunication Networks 4 SH
Presents an overview of modern communication networks including basic principles of network design and performance. Discusses switching and multiplexing techniques and introduces network traffic characterization. The concept of a layered network architecture is used as a framework for understanding the principal functions and services required to achieve reliable end-to-end communications. Topics include service interfaces and peer-to-peer protocols, a comparison of the OSI (open system interconnection) model to the DoD (Internet) and IEEE LAN (local area network) architectures, network-layer and transport-layer issues, and important emerging technologies such as ATM (asynchronous transfer mode) and WDM (wave-division multiplexing). *Coreq. ECE U629. Prereq. MTH U285 or MTH U481.*
- ECE U629 Internetworking Design Lab 1 SH
Presents a detailed examination of the operation of the Internet using a lab-based approach supplemented with readings and brief lectures. Provides in-depth examination of the design and performance of the DoD (TCP/IP) protocol suite. Primary emphasis is on IP and TCP layer issues including addressing, routing, congestion-control, reliable vs. best effort transport, IP address depletion, and mobility. Students conduct experiments with commercial network equipment and measurement gear, and utilize simulation tools. Project involves the implementation of a protocol in the lab. *Coreq. ECE U628.*
- ECE U630 Introduction to Robotics 4 SH
Teams two students together to design and implement a small mobile robot system to complete a specific task. Students compete their robots against robots built by other teams at the end of the course. Develops students' design capabilities of micro-processor-controlled systems with input from sensory devices and output actuators. Topics include actuators, sensors, and system modeling. *Prereq. ECE U534.*
- ECE U638 Special Topics in Computer Engineering 4 SH
Focuses on advanced topics related to computer engineering technology to be selected by instructor. *Prereq. Permission of the department.*

<p>ECE U642 Antennas 4 SH Introduces the fundamental principles of antenna theory. Applies these principles to the design and analysis of practical antennas for radar, broadcast, and wireless communications systems. Covers fundamental antenna parameters; radiation integrals and auxiliary potential function; linear and loop antenna; antenna arrays; broadband dipoles and impedance matching techniques; traveling-wave and broadband antennas; and frequency-independent, aperture, and reflector antennas. A computational project with MATLAB is included. <i>Prereq. ECE U440.</i></p>	<p>ECE U667 Lab for ECE U666 1 SH Accompanies ECE U666. Focuses on practical aspects of DSP by programming a digital signal processing chip in its native assembly language. Topics include input/output operations via A/D and D/A converters, digital frequency synthesis, computation of discrete-time convolution, and design and implementation of both FIR and IIR filters. <i>Coreq. ECE U666.</i></p>
<p>ECE U644 Microwave Networks 4 SH Focuses on advanced analytical, graphical, and matrix analysis of transmission lines and microwave networks. Covers analyses of lossy and lossless transmission lines, electrical scattering S-parameters, active devices, ferrite networks, microwave absorbers, and matrix representation of multiple connected networks. A significant computational project with MATLAB is included. <i>Prereq. ECE U440.</i></p>	<p>ECE U672 Communication Systems 2 4 SH Continues ECE U572. Advanced topics include maximum likelihood sequence detection, communication over fading channels and RAKE receivers, concatenated and turbo coding, iterative decoding, OFDM signaling, space-time codes, spread-spectrum communications, and modulation schemes with memory. <i>Prereq. ECE U572.</i></p>
<p>ECE U646 Optics 4 SH Presents the basic optical concepts necessary for an understanding of current and future optical communication, remote sensing, and industrial and biomedical systems. Topics include geometrical optics, polarized light, diffraction, and interference. Studies lasers and other light sources, optical fibers, detectors, CCD cameras, modulators, and other components of optical systems. Presents applications to specific systems such as fiber-optic communication, medical imaging systems, fiber-optic sensors, and laser radar. A built-in lab component includes experiments on geometrical optics, diffraction, and fiber optics. <i>Coreq. ECE U647. Prereq. ECE U440.</i></p>	<p>ECE U677, ECE U678, ECE U679 1 SH each Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>
<p>ECE U647 Lab for ECE U646 0 SH Accompanies ECE U646. Covers topics from the course through various activities. <i>Coreq. ECE U646.</i></p>	<p>ECE U680 Electric Drives 4 SH Intended for advanced undergraduates and beginning graduate students. Examines all subsystems that comprise an electric drive such as electric machines, power electronic converters, mechanical system requirements, feedback controller design, and interactions with utility systems. Draws upon an integrative approach that requires minimal prerequisites including a junior-level course in signals and systems and some knowledge of electromagnetic field theory (possibly from physics classes), and does not require separate courses in electric machines, controls, or power electronics. <i>Prereq. ECE U464.</i></p>
<p>ECE U664 Biomedical Signal Processing 4 SH Introduces biomedical signal processing and biomedical imaging and image processing. Specific topics covered depend on instructor and/or students' areas of interest, and are drawn from a variety of application areas. They include the nature and processing of intrinsic signals such as cardiac and neurological bioelectric signals, natural processing of external signals such as auditory and visual processing, and topics related to a variety of medical and biological imaging modalities.</p>	<p>ECE U682 Power Systems Analysis 4 SH Intended for advanced undergraduates and beginning graduate students. Fundamentals include phasors, single-phase and balanced three-phase circuits, complex power, and network equations; symmetric components and sequence networks; power transformers, their equivalent circuits, per-unit notation, and the sequence models; transmission line parameters including resistance, inductance, and capacitance for various configurations; steady-state operation of transmission lines including line loadability and reactive compensation techniques; power flow studies including Gauss-Seidel and Newton-Raphson interactive schemes; symmetrical faults including formation of the bus impedance matrix; unsymmetrical faults including line-to-ground, line-to-line, and double line-to-ground faults. <i>Coreq. ECE U683. Prereq. ECE U400 and ECE U440.</i></p>
<p>ECE U666 Digital Signal Processing 4 SH Presents the theory and practice of modern signal processing. Topics include review of discrete-time signals and systems and the Z-transform, sampling and quantization, Fourier transforms (DTFT, DFT, and FFT) with applications to fast convolution, design techniques for FIR and IIR digital filters, realization structures for digital filters and finite precision effects, filter banks and multirate signal processing, and DSP applications. <i>Coreq. ECE U667. Prereq. ECE U464.</i></p>	<p>ECE U683 Power Systems Lab 1 SH Accompanies ECE U682. Addresses topics such as transmission line constants, load flow and short-circuit studies, and transient stability. Includes upgrading the design of a small power system. <i>Coreq. ECE U682.</i></p>

- ECE U684 Power Electronics 4 SH
Intended for advanced undergraduate and beginning graduate students. Provides tools and techniques to analyze and design power conversion circuits that contain switches. Emphasizes understanding and modeling of such circuits, and provides a background for engineering evaluation of power converters. Also covers dynamics and control of this class of systems, enabling students to design controllers for a variety of power converters and motion control systems. Addresses a set of analytical and practical problems, with emphasis on a rigorous theoretical treatment of relevant questions. Designed for students with primary interest in power conditioning, control applications, and electronic circuits, but helpful for designers of high-performance computers, robots, and other electronic and electromechanical systems in which the dynamical properties of power supplies become important. *Prereq. ECE U402 and ECE U464.*
- ECE U686 Electrical Machines 4 SH
Intended for advanced undergraduate and beginning graduate students. Reviews phasor diagrams and three-phase circuits; the magnetic aspects including magnetic circuits and permanent magnets; transformers, their equivalent circuits, and performance; principles of electromechanical energy conversion; and elementary concepts of rotating machines including rotating magnetic fields, steady-state theory, and performance of induction machines, synchronous machines, and direct-current machines. *Prereq. ECE U400 and ECE U464.*
- ECE U692 Introduction to Subsurface Sensing and Imaging 4 SH
Introduces the emerging field of subsurface sensing and imaging (SSI). Topics include the interrelatedness of the three technological levels of sensing, modeling and signal processing, and computational technology, the similarity of SSI across diverse problem domains and size scales, and the variety of information extraction strategies such as localized imaging and the use of multiple views in space, wavelength, and so on. Provides hands-on experience with a particular SSI modality that includes experimental measurement and subsequent processing and visualization of the measured data. *Prereq. ECE U440 and ECE U464.*
- ECE U694 Numerical Methods and Computer Applications 4 SH
Presents numerical techniques used in solving scientific and engineering problems with the aid of digital computers. Topics include modeling and simulating of deterministic and probabilistic systems; theory of interpolation; the theory of least squares; and numerical solution of ordinary and partial differential equations using a programming environment such as MATLAB. Chooses representative problems for solution on a computer.
- ECE U698 Special Topics in Electrical Engineering 4 SH
Covers various topics from term to term, depending on the interests of the department and the students. *Prereq. Permission of the department.*
- ECE U730 Computer Engineering Capstone 1 4 SH
Requires students to select a project requiring design and implementation of an electrical, electronic, and/or software system, form a team to carry out the project, and submit and present a detailed proposal for the work. Students must specify the materials needed for their project, provide cost analysis, and make arrangements with their capstone adviser to purchase and/or secure donation of equipment. Requires student to perform a feasibility study by extensive simulation or prototype design of subsystems to facilitate the second phase of the capstone design. *Prereq. ECE U524 and junior or senior standing.*
- ECE U732 Computer Engineering Capstone 2 4 SH
Continues ECE U730. Requires students to design and implement the project proposed in that earlier course. Expects students to evaluate progress with interim milestone reports and to present the final design project with written and oral reports. *Prereq. ECE U730.*
- ECE U790 Electrical Engineering Capstone 1 4 SH
Requires students to select a project requiring design and implementation of an electrical, electronic, and/or software system, form a team to carry out the project, and submit and present a detailed proposal for the work. Students must specify the materials needed for their project, provide cost analysis, and make arrangements with their capstone adviser to purchase and/or secure donation of equipment. Requires student to perform a feasibility study by extensive simulation or prototype design of subsystems to facilitate the second phase of the capstone design. *Prereq. ECE U524 and junior or senior standing.*
- ECE U792 Electrical Engineering Capstone 2 4 SH
Continues ECE U790. Requires students to design and implement the project proposed in that earlier course. Expects students to evaluate progress with interim milestone reports and to present the final design project with written and oral reports. *Prereq. ECE U790.*
- ECE U921 Directed Study 1 SH
ECE U922 Directed Study 2 SH
ECE U923 Directed Study 3 SH
ECE U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*
- ECE U931 Independent Study 1 SH
ECE U932 Independent Study 2 SH
ECE U933 Independent Study 3 SH
ECE U934 Independent Study 4 SH
Offers theoretical or experimental work under individual faculty supervision. *Prereq. Permission of instructor.*

ECE U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

ECE U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. ECE U970 and honors program participation.*

ECONOMICS

COLLEGE OF ARTS AND SCIENCES

ECN U100 College: An Introduction 1 SH
 Intended for freshmen in the College of Arts and Sciences. Introduces freshmen to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student. *Prereq. Freshman economics major.*

ECN U101 Economic Problems and Perspectives 4 SH
 Studies the economic concepts and methods that are useful to an informed citizen for an understanding of modern social issues. Topics include unemployment, inflation, poverty, crime, the environment, medical care, and international competitiveness. Not recommended for students who have completed either ECN U115 or ECN U116.

ECN U114 Economics for Technology 4 SH
 Studies the economic concepts that deal with the production, distribution, and consumption of commodities. Topics include economic growth, supply and demand, resource allocation, and income distribution. Focuses on the use of economic principles to develop accounting concepts and to define assets, liability, net worth, and additional topics related to engineering economic analysis. *Prereq. MTH U110.*

ECN U115 Principles of Macroeconomics 4 SH
 Introduces macroeconomic analysis. Topics include the flow of national income, economic growth and fluctuation, the role of money and banking, and monetary and fiscal policies. Emphasizes the development of conceptual tools to analyze the economic problems facing modern society.

ECN U116 Principles of Microeconomics 4 SH
 Focuses on development of basic theory of demand, supply, and market price. Explores applications to selected microeconomic problems, such as basic monopoly and competition, and other issues that relate to the role of the pricing system in resource allocation and income distribution.

ECN U230 Health Care and Medical Economics 4 SH
 Enables students to recognize the relevance of economics to health and medical care and apply economic reasoning to understand health-related issues better; to understand the mechanism of health-care delivery in the United States within broad social, political, and economic contexts; to explore the changing nature of health and medical care and its implications for medical practice, medical education and research, and health policy; and to analyze public policy in health and medical care from an economic perspective.

ECN U240 Economics of Crime 4 SH
 Covers economic analysis of crime and the criminal justice system. Topics include theoretical and empirical analysis of the economic causes of criminal behavior; the social costs of crime and its prevention, and the design of enforcement policies.

ECN U270 Economic Status of Ethnic Minorities 4 SH
 Examines the economic conditions and processes as they impact minorities within the U.S. economy. Considers the role of national economic policies undertaken to address general economic and social conditions, as well as policies targeted at minority markets and institutions. Emphasis is on empirical analysis; historical and cultural materials may be incorporated.

ECN U277, ECN U278, ECN U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ECN U281 Economics of Art and Culture 4 SH
 Presents an overview of the economic aspects of art and culture. Examines the production and consumption of art and culture, as well as the role of the public and private sectors. Topics include consumer demand; economic models of non-profit cultural organization; competition and market structure in the arts; artists as members of the labor force; productivity issues in the performing arts; public support for the arts; and the role and impact of public and private subsidies.

ECN U290 The Global Economy 4 SH
 Covers ideological biases in economics; the extent of global disparities around 1800; evolution of global disparities since 1800; evolution of international integration and international trading and monetary regimes, 1800–2000; theories explaining global disparities including classical, neoclassical, Marxian, neo-Marxian, and structuralist; import-substituting industrialization in Latin America, Asia, and Africa; international debt crises of the nineteenth and twentieth centuries; GATT (General Agreement on Tariffs and Trade) and WTO (World Trade Organization); and a socialist experience and transition to capitalism.

- ECN U291 Development Economics 4 SH
Covers ideological biases in economics; origins of the industrial revolution; the evolution of global disparities, and how markets, imperialism, and racism affected this process; theories of neoclassical and institutional growth; growth and structural change; growth and demographic change; growth, income distribution, and welfare; development policies such as import-substitution vs. outward-orientation; growth based on primary exports; and the socialist experience and transition to capitalism.
- ECN U293 European Economic History 4 SH
Covers European economic history from ancient times to the twentieth century. A brief survey of early Greek and Roman economic life provides the context for more in-depth analysis of medieval, mercantilist, and modern economic institutions. Emphasis is on the role of technology, trade, and natural resources in the development of modern European economies.
- ECN U305 Economics Is What Economists Do 1 SH
Provides students with an understanding of what it is that economists do and what the future may hold for them. Consists of presentations by faculty on their research, by members of the Department of Cooperative Education on cooperative education employment opportunities, by representatives from Career Services and alumni of the Department of Economics on permanent employment opportunities and experiences, and by representatives of relevant graduate and professional schools. *Prereq. Nonfreshman economics major.*
- ECN U315 Macroeconomic Theory 4 SH
Presents several theoretical approaches to the study of short-run economic instability and long-run growth. Uses conceptual and mathematical tools to examine what economists believe to be the major determinants of fluctuations in employment and price level, as well as the rate of economic growth. The theoretical models are used to evaluate the operation and impact of various macroeconomic policy tools. *Prereq. ECN U115 and MTH U131.*
- ECN U316 Microeconomic Theory 4 SH
Examines supply-and-demand analysis, various elasticity concepts and applications, theories of demand and production, and derivation of cost curves. Analyzes pricing and output behavior in the several market structures with their welfare and the pricing of resources. *Prereq. ECN U116 and MTH U131.*
- ECN U350 Statistics 4 SH
Discusses basic probability, descriptive statistics, estimation techniques, statistical hypotheses, sampling, analysis of variance, correlation, and regression analysis in the context of economics. Computer applications are an integral part of the course.
- ECN U410 Labor Economics 4 SH
Focuses on an economic analysis of the labor market, the labor force, and workers' wages and earnings. Topics include supply, development, and efficient use of human resources; the demand for labor by businesses and industries; wage inequality and its determinants; the changing occupational and industrial structure; causes, nature, and incidence of unemployment; the economic impact of unions; and the influence of related labor market institutions and relevant public policies including minimum wages, wage subsidies, and earned income tax credits. *Prereq. ECN U115 or ECN U116.*
- ECN U414 Economics of Human Capital 4 SH
Explores theoretical and empirical treatment of economic issues related to investments in human capital including formal education (preschool through postsecondary), vocational education, on-the-job training, work experience and government-sponsored employment and training programs, and their impacts on individuals and society. Emphasizes studies of public policies to promote human capital investments including cost-effectiveness analysis and benefit-cost analysis for determining the effectiveness of investments in literacy, education, and training from a private and social standpoint. *Prereq. ECN U116.*
- ECN U415 Poverty and Income 4 SH
Focuses on economic analysis of inequalities in incomes, earnings, and wealth; poverty; and discrimination. Examines the causes of economic inequality and the nature, causes, and effects of poverty; explores an array of public policies to reduce poverty and inequalities in income, earnings, and wealth. *Prereq. ECN U115 or ECN U116.*
- ECN U420 Urban Economic Issues 4 SH
Studies urban growth and development, focusing on economic analysis of selected urban problems such as housing, poverty, transportation, education, health, crime, and the urban environment. Discusses public policies related to such problems. *Prereq. ECN U116.*
- ECN U422 Economics of Transportation 4 SH
Covers transportation and land-use patterns; externalities; special costs and social benefits of various modes of transportation, ownership, regulations, and financing of various modes of transportation; and economics of new technology in transportation. *Prereq. ECN U116.*
- ECN U423 Environmental Economics 4 SH
Applies the tools of economics to environmental issues. Explores taxonomy of environmental effects; externalities; the commons problem; taxation, regulations, marketable permits, and property rights as a solution; measuring benefits of cleaner air and water, noise abatement, and recreational areas; global issues including tropical deforestation and acid rain; and the relevance of economics to the environmental debate. *Prereq. ECN U116.*

<p>ECN U440 Public Finance 4 SH Presents an overview of the economics of government and the role of public policy. Develops guidelines to determine which economic activities are best performed by government and which are not. Also examines the impact of tax policies on efficiency, economic growth, and equity. Topics include market failures, public choice, the personal income tax, the corporate tax, sales tax, taxation of capital and wealth, and options for reform of the tax structure. Major spending programs such as Social Security and education and health care are analyzed. <i>Prereq. ECN U116.</i></p>	<p>neoclassical, and Keynesian. Emphasizes the relationship between historical changes in society and economic thought, focusing on changes in the types of questions economists ask and the analytical tools they use. <i>Prereq. ECN U115 and ECN U116.</i></p>
<p>ECN U442 Money and Banking 4 SH Covers the nature and functions of money, credit, and financial markets in the modern international economy. Analyzes financial markets and institutions, central banking, and the effects of interest and foreign exchange rates on the real economy. <i>Prereq. ECN U115.</i></p>	<p>ECN U560 Applied Econometrics 4 SH Examines research methods used by practicing economists. Discusses typical problems from applied areas of economics including choice of modeling framework, problems of data collection, review of estimation techniques, interpretation of results, and development of static and dynamic adaptive policy models. A research paper utilizing computer applications is an integral part of the course. <i>Prereq. ECN U115, ECN U116, and ECN U350.</i></p>
<p>ECN U460 Managerial Economics 4 SH Explores the application of economic principles to the solution of managerial decision-making problems in areas such as demand estimation, cost estimation and control, pricing and marketing strategies, employee incentives, financing of capital investments, and responses to government regulation and taxation. Case studies and simulation models are typically used as pedagogical tools. <i>Prereq. ECN U116.</i></p>	<p>ECN U634 Comparative Economics 4 SH Describes the uniqueness of modern market economies in terms of social institutions that serve limited economic ends. Begins with a presentation of traditional economic analyses of the advantages and disadvantages of market economies. Examines these theories in light of evidence from economic anthropology regarding the evolution of market institutions and from the problems encountered in contemporary transitional economies as they move from command to market institutions. <i>Prereq. ECN U115 and ECN U116.</i></p>
<p>ECN U461 Government and Business 4 SH Examines the government's role in regulating economic activity. Discusses factors behind the trends of market deregulation and increasing social regulation. Develops criteria to determine when regulation and antitrust law is desirable. Topics include antitrust laws and their enforcement; regulation of public utilities, transportation, and communication industries; and regulation of environmental, health, and product and workplace safety. <i>Prereq. ECN U116.</i></p>	<p>ECN U635 International Economics 4 SH Covers Ricardian and neoclassical theories of trade; trade policies; tariffs, quotas, voluntary export restraints, and customs union; global trade regime; GATT (General Agreement on Tariffs and Trade) and WTO (World Trade Organization); balance-of-payments accounts; foreign exchange markets; monetary and portfolio balance approaches to external balance; fixed or flexible exchange rates; and international monetary system. <i>Prereq. ECN U115 and ECN U116.</i></p>
<p>ECN U470 American Economic History 4 SH Covers the economic history of the United States from the colonial period to the present. Includes studies of the development of major economic institutions and the effects of technological change. Examines economic reasons for the spread of an industrial market economy in the nineteenth century and the successes and failures of this economy in the twentieth century. <i>Prereq. ECN U115.</i></p>	<p>ECN U653 Mathematics for Economics 4 SH Introduces basic tools of mathematics, matrix algebra, differential and integral calculus, and classical optimization, with special reference to economic applications. Computer applications are an integral part of the course. <i>Prereq. ECN U115 and ECN U116.</i></p>
<p>ECN U477, ECN U478, ECN U479 1 SH each Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>	<p>ECN U677, ECN U678, ECN U679 1 SH each Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>
<p>ECN U520 History of Economic Thought 4 SH Traces the evolution of Western economic thought. Covers several important periods and schools of economic thought including mercantilism, physiocracy, classical, Marxist,</p>	<p>ECN U680 Industrial Organization and Public Policy 4 SH Presents an analytic framework and empirical study of how the structure of industries and the conduct of sellers affect performance. Includes examples and case studies from both the "old economy" and the "new economy." Examines antitrust as a public policy designed to promote better market performance. <i>Prereq. ECN U316.</i></p>

ECN U692 Senior Economics Seminar 4 SH
Incorporates aspects of real-world and academic experiences of students into an analytical context, enabling students to demonstrate their ability to apply economic concepts, methodology, and data to economic issues and problems of personal and philosophical significance. *Prereq. ECN U315, ECN U316, and ECN U350; senior economics majors only.*

ECN U915 Selected Topics in Macroeconomics 4 SH
Studies macroeconomic issues. *Prereq. Permission of instructor.*

ECN U916 Selected Topics in Microeconomics 4 SH
Studies microeconomic issues. *Prereq. Permission of instructor.*

ECN U921 Directed Study 1 SH
ECN U922 Directed Study 2 SH
ECN U923 Directed Study 3 SH
ECN U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. May not be substituted for requirements leading to a BA or BS in economics. *Prereq. Senior economics majors and permission of department chair.*

ECN U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

ECN U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. ECN U970 and honors program participation.*

EDUCATION

COLLEGE OF ARTS AND SCIENCES

ED U101 Reading and Study Skills 1 4 SH
Provides instruction to students who demonstrate a need to be more efficient in comprehending and studying college textbooks and collateral reading assignments. Concentrates on techniques involved in understanding informative materials and introduces the evaluation of persuasive prose. In addition, presents suggestions on such topics as how to listen to and take summary notes on course lectures and how to set study goals and priorities consistent with course objectives.

ED U102 Reading and Study Skills 2 4 SH
Continues ED U101. Expands upon the analysis and interpretation of persuasive texts. Emphasizes reading imaginative prose for meaning and pleasure, preparing for and taking

examinations, and learning to adjust reading speed and method to various materials encountered in concurrent courses. *Prereq. ED U101.*

ED U111 Education in the Community 4 SH
Introduces students to the role and place of education in America today. *Coreq. ED U945.*

ED U113 Human Development and Learning 4 SH
Examines physical, cognitive, social, and emotional development in children and adolescents. Considers the educational implications of these domains of human development.

ED U150 Multicultural Children's Literature 4 SH
Examines the role of teachers and parents in fostering in all children a love of reading and the power of their imagination. Explores the role of traditional literature and fairy tales from around the world in helping children cope with life's challenges, despite the often stereotypical roles they portray and amid the availability of modified cartoon versions. Students reflect on their own reading experiences in and out of school, practice reading to and with children, visit libraries, collect books for their own classroom libraries, and write an original children's story. Major focus is on helping all children in our schools (especially those who are not read to at home who want to become active, independent readers), and how teachers and parents can work together toward that goal.

ED U277, ED U278, ED U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ED U444 Linguistics in Education 4 SH
Explores the role that language plays in education. Topics include the role of language acquisition in psychological development and the implications for formal education; literacy (what does it mean to be literate, how is literacy acquired, and the role that literacy plays in education); the role that language and discourse patterns play in the classroom, in student learning, and in testing; and multilingualism in the classroom. *Prereq. LIN U150 or ENG U150 is recommended.*

ED U477, ED U478, ED U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ED U485 Education Issues in the Black Community 4 SH
Focuses on some of the important issues in today's urban elementary and secondary education systems. Examines the historical development of these issues, and students are encouraged to discuss the issues' future significance.

- ED U503 Human Development, Learning, and Education 4 SH
Examines the continuity of human development from childhood through adolescence and adulthood. Considers significant areas of growth, development, and adjustment for each period including social, personality, motivational, and cognitive aspects. Graduate students are required to demonstrate advanced levels of study and research.
- ED U504 Learning and Accomplished Practice 4 SH
Provides a practice-mediated survey of contemporary educational theory of human learning and accomplished teaching. Develops a working understanding of teaching and learning as they occur in different types of schools and community settings. Investigates two kinds of theories, theories of learning and cognition—how humans learn, acquire knowledge, and make sense of their experiences; and theories of teaching or pedagogy—how best to teach for understanding and learning achievement. Students synthesize their developing understanding through instructional activity with children in field placements. Besides the field placement, a performance assessment is necessary to complete the course satisfactorily. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. Admission to the School of Education.*
- ED U511 Curriculum Design and Assessment 4 SH
Explores the discourse about “curriculum” as an evolution in our thinking about what’s worth learning and teaching. Links learning theory and teaching practice in three key areas: the impact of the community on the student as a learner, the role of pedagogy in creating access to learning for all students, and the selection of curriculum content to create both inclusive and challenging learning environments. Students examine and develop several curricula as they explore the process of curriculum construction. Presents an opportunity, prior to student teaching, for students to model both the concrete activities of the curriculum design process and their reflection on that process. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. ED U504.*
- ED U521 Language, Culture, and Literacy 4 SH
in Middle and High Schools
Examines the interrelationships among language, culture, and identity, and explores the implications of those relationships for effective teaching in middle schools and high schools. Considers issues of linguistic diversity within their broad sociopolitical and philosophical contexts, paying particular attention to how language discrimination functions within the context of other forms of systematic oppression in our society. Explores the processes of identity development in the context of schooling and literacy performance. Also examines methods of helping linguistically diverse students develop their oral and written language abilities within a learning environment that draws upon and celebrates their native language abilities and traditions. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. ED U504.*
- ED U522 Teaching the Language Arts 4 SH
Aims at developing competence and confidence in secondary teachers working with diverse students, many of whom appear to read and write only when required to do so. Considers the design and practices of traditional English curricula at the middle and high school levels. Explores alternative syllabi and unit design as strategies for actively engaging students in the pursuit of meaning in reading and writing as they enhance their skills. Examines the role of research as well as interdisciplinary and collaborative approaches as they relate to curricula in English and the humanities. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. ED U504.*
- ED U524 Teaching History and Social Studies 4 SH
Explores the intersecting disciplines of history and social studies including geography, sociology, economics, political science, and history. Emphasizes the interrelatedness of disciplines and the emerging role of middle and high school students as citizens in their school, community, nation, and the world. Examines the challenge of covering all the material deemed “essential” by state and district curriculum frameworks, while helping one’s students become problem solvers and critical thinkers in their analysis of social problems. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. ED U504.*
- ED U525 Pedagogy for Teaching Science 4 SH
Examines how the evolving nature of science—ideas, theories, concepts, and controversies—relates to diverse middle and high school students, and how teachers can use experience-based, problem-centered approaches that engage the range of student learners and help them meet local and state learning goals. Identifies research possibilities within school contexts, both inside and outside the laboratory. Explores curricular frameworks and culturally relevant content to enable teachers to create a learning environment that supports inquiry and problem solving. Examples of excellent curriculum products, programs, assessments, and technology tools are analyzed. Students develop a curriculum unit including assessment philosophy and practices. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. ED U504.*
- ED U526 Pedagogy for Teaching Mathematics 4 SH
Explores mathematics teaching methods that are research based, experienced based, and grounded in the contemporary theoretical frameworks influencing mathematics education. Emphasis is on issues related to teaching math in an urban school, problem solving, communication, connections, technology integration, as well as issues of access and equity, assessment, and cross-content teaching strategies. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. ED U504.*
- ED U552 Inquiry in the Humanities and Social Sciences 4 SH
at the Elementary Level
Examines how teachers enhance children’s understanding of history and social studies as part of a coordinated approach to the humanities. The goal is for teachers to engage students actively in reading, writing, and speaking through approaches that develop critical skills and habits of mind in relation to

issues of citizenship, community, social justice, and the pursuit of truth in an evolving world. Explores methodology and curriculum design that is applicable within and beyond social studies/history and language arts/English. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. ED U504.*

ED U553 Inquiry in Math and Science at the Elementary Level 4 SH
Designed to help students enhance their understanding of how children develop math, science, and technology knowledge and skills, and how the three are interconnected. Research into current issues influencing elementary school math, science, and technology is examined. Special attention is given to strategies for planning and implementing an integrated lesson; equity, gender, and access issues; problem solving; state and national curriculum and assessment issues related to math, science, and technology education; and using standards-based curriculum materials. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. ED U504.*

ED U561 Curriculum for the Pre-K Years 4 SH
Presents theories of active learning and learning through play as applied in the prekindergarten years. Offers students the opportunity to learn to specify goals in order to facilitate children's growth, development, and achievement of skills in communication, inquiry, creative expression, and interpersonal relations; plan, implement, and evaluate content and methodology in various curriculum areas; incorporate developmentally appropriate, integrated learning experiences; select materials and create learning environments; and integrate children with special needs. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. ED U504.*

ED U567 Literacy Development and Instruction 4 SH
Using an inquiry approach, explores the rich complexity of literacy development and instruction in the elementary grades. Considers reading and writing as ways of exploring and reacting to the world in a thoughtful, articulate manner. Considers how reading, writing, speaking, and listening are interrelated, critical processes for exploring and responding to the world. An integrated language model serves as a basis for instructional methodology. Explores a range of approaches to reading and writing instruction, based on students' own experiences and questions, in light of research on cognitive development and language acquisition informed by political and sociocultural perspectives. Graduate students are required to demonstrate advanced levels of study and research. *Coreq. ED U946. Prereq. ED U504.*

ED U570 Inclusion, Equity, and Diversity 4 SH
Provides students with tools and understanding to address the range of learning needs of special education legislation, as well as the politics of who is identified and why. Examines students' own attitudes about teaching children with learning disabilities, and develops skills and strategies for identifying and teaching students with special learning needs. Graduate students are required to demonstrate advanced levels of study and research. *Prereq. ED U504.*

ED U677, ED U678, ED U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ED U921 Directed Study 1 SH
ED U922 Directed Study 2 SH
ED U923 Directed Study 3 SH
ED U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

ED U945 Teaching Preparatory Lab 1 0 SH
Complements ED U111 by providing a field placement in a community-based educational setting. Successful completion of the course is required before students apply to the School of Education. *Coreq. ED U111.*

ED U946 Teaching Preparatory Lab 2 0 SH
Provides field placement and performance assessment that complements an intermediate or advanced course taken concurrently by students in the School of Education. *Coreq. ED U567. Prereq. Admission to the School of Education.*

ED U947 Teaching Preparatory Lab 3 0 SH
Provides field placement and performance assessment that complements an intermediate or advanced course taken concurrently by students in the School of Education. *Prereq. Admission to the School of Education.*

ED U948 Supervised Teaching Practicum 4 SH
Offers supervised, semester-long teaching internship in the Boston Public School system. The internship provides a field-based assessment of teaching performance. *Prereq. ED U504, completion of teacher preparation program, pass appropriate teacher licensure tests, and permission of the instructor.*

ED U949 Teaching Practicum and Seminar 8 SH
Offers supervised, semester-long teaching internship in the Boston Public School system and reflection seminar for students not in the combined bachelor's/MAT program. The internship provides a field-based assessment of teaching performance. *Prereq. ED U504.*

ED U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

ED U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. ED U970 and honors program participation.*

ELECTRICAL ENGINEERING TECHNOLOGY

SCHOOL OF ENGINEERING TECHNOLOGY

EET U201 Circuit Analysis 1 4 SH
Discusses circuit variables of current, voltage, power, and energy. Introduces basic circuit theory laws such as Ohm's law, Kirchhoff's laws, Thevenin and Norton's theorems, and Superposition and applies them to DC circuits. Topics include energy storage devices (capacitors and inductors), mesh and nodal analysis, and operational amplifiers. The transient responses of RC and RL circuits are developed by solving first-order differential equations. Using second-order differential equations, solutions are developed for parallel and series RLC circuits. Solution of AC circuits by frequency domain methods are introduced. The basic circuit laws are applied to AC circuits using phasor algebra. The concepts of impedance and admittance are developed. Introduces computer-assisted solutions using simulation software. *Coreq. EET U202. Prereq. MTH U121 or taken concurrently.*

EET U202 Lab for EET U201 0 SH
Accompanies EET U201. Covers topics from the course through various experiments. *Coreq. EET U201.*

EET U277, EET U278, EET U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

EET U301 Circuit Analysis 2 4 SH
Continues EET U201. Discusses RMS values of current and voltage, instantaneous and average power, complex power, reactive power, power factor, and delta and wye configurations of polyphase (three-phase) systems. Mutual inductance is revisited to explain the operation of the ideal transformer. The Power Triangle is used to relate real, reactive, and apparent power. Laplace transforms and their inverse along with the concept of the s-domain are presented and applied to circuit solutions. Solutions of networks using nonsinusoidal forcing functions are introduced using Fourier analysis. Computer-assisted solutions using simulation software continue. *Coreq. EET U302. Prereq. EET U201.*

EET U302 Lab for EET U301 0 SH
Accompanies EET U301. Covers topics from the course through various experiments. *Coreq. EET U301.*

EET U311 Analog Electronics 1 4 SH
Reviews the theory of linear circuits and extends it to simple two- and three-terminal nonlinear circuits. Considers the solid-state theory of the PN diode as an example of the two-terminal device, and the NPN, PNP, and field-effect devices as examples of the three-terminal elements. Includes light-sensitive and heat-sensitive solid-state devices. Considers the problem of selecting an operating point for a nonlinear device, and the corresponding practical methods of providing the required biases. Introduces the small-signal linear model for the nonlinear device in the vicinity of the operating point. Discusses frequency response of such models. Also reviews Mason's signal flow graph concepts. Examines operational amplifiers, specifically their ideal behavior. Computer simulations required. *Coreq. EET U312. Prereq. EET U201.*

EET U312 Lab for EET U311 0 SH
Accompanies EET U311. Covers topics from the course through various experiments. *Coreq. EET U311.*

EET U316 Analog Electronics 2 4 SH
Continues EET U311. Reviews the Bode asymptotic approximation to frequency response. Also reviews Mason's signal flow graph concepts for determining transfer functions. Reviews operational amplifiers including their ideal behavior and the limitations introduced by finite input and output impedances, finite gain, and finite bandwidth. Explores feedback and stability problems that can occur when using operational amplifiers. Studies applications of feedback to oscillators and active filters. Discusses various operational amplifier topologies including differential and instrumentation types. Introduces various types of active filters including the Sallen-Key and state-variable topologies. Some computer simulations required. *Coreq. EET U317. Prereq. EET U311.*

EET U317 Lab for EET U316 0 SH
Accompanies EET U316. Covers topics from the course through various experiments. *Coreq. EET U316.*

EET U321 Digital Electronics 1 4 SH
Introduces the basic elements of digital logic systems including decimal, binary, octal, and hexadecimal numbering systems. Extends these concepts to the design of coding systems such as binary, binary-coded decimal, Gray code, seven-segment displays, and multiplexers. Continues with Boolean algebra including applications of DeMorgan's theorems. Discusses the application of Boolean algebra to the solution of combinational logic circuit topologies. Examines the basic bi-stable memory storage element (flip-flops) and applies it to the concept of sequential circuits such as ripple counters, synchronous counters, Johnson counters, ring counters, and shift registers. Includes an analysis and design perspective of combinational and sequential circuits. Some computer simulations required. *Coreq. EET U322. Prereq. EET U201.*

EET U322 Lab for EET U321 0 SH
Accompanies EET U321. Covers topics from the course through various experiments. *Coreq. EET U321.*

<p>EET U326 Digital Electronics 2 4 SH Continues EET U321. Examines the physical devices used to realize digital circuits, as a complement to the previous treatment of idealized mathematical models. Introduces the concepts of rise-time, fall-time, set-up time, hold-time, delay-time, and the maximum frequency of a clock. Discusses the presently available logic families such as TTL, CMOS, and EC, and considers interconnection problems. Introduces memory elements and field-programmable logic elements. Presents interfacing devices such as analog-to-digital and digital-to-analog converters. Some computer simulations required. <i>Coreq. EET U327. Prereq. EET U321.</i></p>	<p>EET U342 Lab for EET U341 0 SH Accompanies EET U341. Covers topics from the course through various experiments. <i>Coreq. EET U341.</i></p>
<p>EET U327 Lab for EET U326 0 SH Accompanies EET U326. Covers topics from the course through various experiments. <i>Coreq. EET U326.</i></p>	<p>EET U346 Basic Power Systems 1 4 SH Presents fundamentals of single-phase and three-phase power systems. Introduces symmetrical components and sequence networks, two- and three-winding power transformers modeling, and the per unit system. Explores calculation of power transmission line. Examines modeling and steady-state operation of transmission lines. <i>Coreq. EET U347. Prereq. EET U301.</i></p>
<p>EET U328 Advanced Electronics Lab 1 1 SH Includes experiments using oscilloscopes, and examines transistor audio amplifiers, push-pull amplifiers, drivers, pulse and video amplifiers, transients and wave-shaping circuits, audio frequency oscillators, and operational amplifiers. <i>Prereq. Permission of faculty adviser.</i></p>	<p>EET U347 Lab for EET U346 0 SH Accompanies EET U346. Covers topics from the course through various experiments. <i>Coreq. EET U346.</i></p>
<p>EET U331 Electrical Measurements 4 SH Explores standards of measurements, dimensional analysis, errors and measurements of dispersed data, discrete and continuous variables, binomial distribution, and normal distribution using DMM counters, oscilloscopes, spectrum analyzers, digital voltmeters, and other test equipment. <i>Coreq. EET U332. Prereq. EET U301.</i></p>	<p>EET U350 Basic Power Systems 2 4 SH Continues EET U346. Develops power flow analysis techniques. Introduces symmetrical faults and fault interruption via circuit breakers and fuses. Introduces unsymmetrical faults, power system relaying and protection, turbine-generator control, economic dispatch of generation, power system stability, and transient analysis of traveling waves. <i>Coreq. EET U351. Prereq. EET U346.</i></p>
<p>EET U332 Lab for EET U331 0 SH Accompanies EET U331. Covers topics from the course through various experiments. <i>Coreq. EET U331.</i></p>	<p>EET U351 Lab for EET U350 0 SH Accompanies EET U350. Covers topics from the course through various experiments. <i>Coreq. EET U350.</i></p>
<p>EET U336 Engineering Analysis 4 SH Introduces differential equation solution for electrical and mechanical applications. Focuses on Laplace and Fourier methods of solution. Discusses mathematical models, boundary, and initial conditions. Examines linear differential equations with constant coefficients, homogeneous and nonhomogeneous. Explores the variation of parameters and undetermined coefficients and simultaneous differential equations. Studies the orthogonal functions and numerical solutions of differential equations. Students are required to purchase a graphing calculator, the make and model to be specified at the first class meeting. <i>Prereq. EET U301 and MTH U142.</i></p>	<p>EET U370 Applied Photonics 4 SH Educates engineers to the theory and application of key photonic devices used in engineering disciplines (electrical, mechanical, civil, and so on). Begins with an analysis of light interaction principles and develops a functional scheme to catalog photonic devices by their light (radiation) interaction. Presents the theories and key applications of photonic devices for all types of measurements and sensing; material processing that involves material characterizations as well as material ablation behaviors; and information processing that includes fiber-optic transmission-related devices as well as storage, display, and other useful devices. Source characteristics and properties, such as for lasers, are also treated. Course work includes a student report on a key photonic application. No previous optics background is required. <i>Coreq. EET U371. Prereq. MTH U121.</i></p>
<p>EET U341 Energy Conversion 4 SH Introduces magnetic aspects of rotating machines and transformers. Operating characteristics of DC generators and motors are developed. Demonstrates electric power generation using synchronous generators. Transmission of power at high voltage is introduced by application of three-phase power transformers. Induction motor characteristics are developed. Various single-phase motors and machines such as servomotors, stepper motors, and split-phase induction motors are introduced. <i>Coreq. EET U342. Prereq. EET U301.</i></p>	<p>EET U371 Lab for EET U370 0 SH Accompanies EET U370. Covers topics from the course through various experiments. <i>Coreq. EET U370.</i></p>
	<p>EET U372 Optical Systems 4 SH Develops the basics of optical imaging in the Gaussian approximation and analyzes the various designs stemming from lens aberration, intent and forms of optical systems, and flux throughput. Emphasizes a physically descriptive analysis of such applications as nondiffractive interference effects (interferometers, interference filters, high- and antireflection films, and longitudinal "laser" cavity modes) and diffraction effects (apertures and gratings). Also discusses wave imagery,</p>

image processing, and the 3-D imaging of holography; polarization phenomena and associated materials and devices; and basic quantum optics. *Coreq. EET U373. Prereq. PHY U161 and MTH U142.*

EET U373 Lab for EET U372 0 SH
Accompanies EET U372. Covers topics from the course through various experiments. *Coreq. EET U372.*

EET U477, EET U478, EET U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

EET U480 Topics in Electrical Engineering Technology 4 SH
Engages students in theoretical or experimental work under individual faculty supervision. *Coreq. EET U481. Prereq. Permission of faculty adviser.*

EET U481 Lab for EET U480 0 SH
Accompanies EET U480. Covers topics from the course through various experiments. *Coreq. EET U480.*

EET U511 Analog Circuit Computer Simulation 4 SH
Introduces selected advanced topics in electrical engineering technology. Various analog circuits are analyzed via hand calculation analysis and computer simulation. Explores the advantages and disadvantages of using computer simulation in solving analog electronic circuit problems and offers firsthand exposure to the concept of team engineering design. *Coreq. EET U512. Prereq. EET U312.*

EET U512 Lab for EET U511 0 SH
Accompanies EET U511. Covers topics from the course through various experiments. *Coreq. EET U511.*

EET U521 Digital Computers 4 SH
Introduces the field of digital computer design. Topics include general computer organization, number systems and number representations, design characteristics of major computer units, and Boolean algebra applications to computer design. Examines microprocessor architecture and organization. Studies the machine language and assembly coding of an industry-accepted microprocessor. Assigns an assembly language coding problem and analyzes a suitable topic from the current literature. *Coreq. EET U522. Prereq. EET U312 and EET U321.*

EET U522 Lab for EET U521 0 SH
Accompanies EET U521. Covers topics from the course through various experiments. *Coreq. EET U521.*

EET U551 Communication Systems 1 4 SH
Introduces signal analysis using Fourier methods; noise in communication systems; frequency selective amplifiers including wideband; transistor power amplifiers AF and RF; oscillators;

signal sources; and applications. Explores the basic theory of amplitude, frequency, phase, and pulse code modulated systems; analysis of modulating and demodulating circuits; carrier systems using SSB; system block and level diagrams; logic control circuits in communication systems; and modems. *Coreq. EET U552. Prereq. EET U312.*

EET U552 Lab for EET U551 0 SH
Accompanies EET U551. Covers topics from the course through various experiments. *Coreq. EET U551.*

EET U554 Communication Systems 2 4 SH
Continues EET U551. Presents the fundamentals of digital communications; sampling requirements; analog-to-digital conversion methods; system capacity and bandwidth; comparison of practical digital systems PAM, PCM, PFM, and PWM; time and frequency division multiplexing; data decoding; and selected examples from telemetry and computer links. *Coreq. EET U555. Prereq. EET U551.*

EET U555 Lab for EET U554 0 SH
Accompanies EET U554. Covers topics from the course through various experiments. *Coreq. EET U554.*

EET U558 Distributive Systems 4 SH
Introduces characteristics, transient, and steady-state conditions of transmission lines. Topics include communication via microwave, fiber optics, and satellite transmission. Antenna fundamentals are studied. *Coreq. EET U559. Prereq. EET U336.*

EET U559 Lab for EET U558 0 SH
Accompanies EET U558. Covers topics from the course through various experiments. *Coreq. EET U558.*

EET U561 Control Engineering 4 SH
Introduces analysis of feedback control systems under both transient and steady-state conditions. Examines utilization of signal flow graphs and Laplace transforms in the formulation of block diagrams and transfer functions for use in control system modeling. Reviews performance characteristics of feedback control systems. Analyzes the stability of feedback control systems using the Routh-Hurwitz criterion. Determines roots of the system transfer function characteristic equation using the root locus method. Evaluates steady-state response using frequency plots and measurement techniques. Introduces the Nyquist criterion and methods to improve system performance through compensation. *Coreq. EET U562. Prereq. EET U301 and MTH U142.*

EET U562 Lab for EET U561 0 SH
Accompanies EET U561. Covers topics from the course through various experiments. *Coreq. EET U561.*

EET U566 Industrial Control Systems 1 4 SH
Introduces operational safety. Examines the concept of the programmable logic controller (PLC) and its associated I/O elements. Works with various manufacturers' PLCs while understanding coding concepts in relay ladder logic (RLL).

Examines distributed I/O and its applications. Examines the concept of the variable frequency drive (VFD). Weekly student design projects are required as the concept of team design is utilized. A final team project is required. *Coreq. EET U567. Prereq. EET U301 and MTH U142.*

EET U567 Lab for EET U566 0 SH
Accompanies EET U566. Covers topics from the course through various experiments. *Coreq. EET U566.*

EET U570 Industrial Control Systems 2 4 SH
Continues EET U566. Studies operational safety. Examines the concept and application of an open architecture PC-based industrial control system such as DeviceNet. Examines the concept of the PC-based ICS controller and its associated I/O sensor elements such as proximity and photoelectric devices as well as various complex mechanical limit switches. Considers various software manufacturers' DeviceNet systems while understanding coding concepts such as block-diagram coding. Weekly student design projects are required as the concept of team design is utilized. A final team project is required. *Coreq. EET U571. Prereq. EET U566 and previous experience with a high-level programming language such as C/C++.*

EET U571 Lab for EET U570 0 SH
Accompanies EET U570. Covers topics from the course through various experiments. *Coreq. EET U570.*

EET U677, EET U678, EET U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

EET U921 Directed Study 1 SH
EET U922 Directed Study 2 SH
EET U923 Directed Study 3 SH
EET U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

EET U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

EET U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. EET U970 and honors program participation.*

ENGLISH

COLLEGE OF ARTS AND SCIENCES

ENG U100 College: An Introduction 1 SH
Intended for freshmen in the College of Arts and Sciences. Introduces freshmen to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

ENG U101 Introductory Writing—SOL 4 SH
(Speakers of Other Languages)
Introduces students to the components of the writing process, from generating ideas to drafting and revising. In a workshop setting, students learn to read texts of some complexity (which in turn serve as the occasion for their own writing), and to write expository prose that makes use of a variety of rhetorical strategies and research methods while demonstrating a control of the conventions of standard edited written English. Requires students to write multiple drafts and emphasizes the writing process as well as the quality of the finished product. Students must keep a portfolio of their work. *Prereq. Diagnostic placement for non-native speakers.*

ENG U102 College Writing—SOL 4 SH
(Speakers of Other Languages)
Offers students the opportunity to move across texts and genres (such as expository essays, fiction, or film), focusing on the basics of composition and the use of metaphor, organization, selection, gaps and silences, tone, and point of view. Through a series of sequenced assignments, students read fiction and nonfiction texts of some complexity, make the critical interpretation of these texts the occasion for their own writing, write expository prose that makes use of a variety of rhetorical strategies, conduct library research when appropriate, reflect on and assess their writing, and refine their documentation skills. Requires students to write multiple drafts and emphasizes the writing process as well as the quality of the finished product. Students must keep a portfolio of their work. *Prereq. Requires "satisfactory" in ENG U101 or special placement.*

ENG U110 Introductory Writing 4 SH
Introduces students to the components of the writing process, from generating ideas to drafting and revising. In a workshop setting, students learn to read texts of some complexity (which in turn serve as the occasion for their own writing), and to write expository prose that makes use of a variety of rhetorical strategies and research methods while demonstrating a control of the conventions of standard edited written English. Requires students to write multiple drafts and emphasizes the writing process as well as the quality of the finished product. Students must keep a portfolio of their work. *Prereq. Special placement on diagnostic examination.*

<p>ENG U111 College Writing 4 SH Offers students the opportunity to move across texts and genres (such as expository essays, fiction, or film), thus focusing on the basics of composition and the use of metaphor, organization, selection, gaps and silences, tone, and point of view. Through a series of sequenced assignments, students read fiction and nonfiction texts of some complexity, make the critical interpretation of these texts the occasion for their own writing, write expository prose that makes use of a variety of rhetorical strategies, conduct library research when appropriate, reflect on and assess their writing, and refine their documentation skills. Requires students to write multiple drafts and emphasizes the writing process as well as the quality of the finished product. Students must keep a portfolio of their work. <i>Prereq. Special placement on diagnostic examination.</i></p>	<p>ENG U221 Survey of English Literature 2 4 SH Surveys the major British writers and major literary movements from the Romantic period through the Victorian and modern periods to the present. Includes works by such writers as Wordsworth, Coleridge, Keats, Browning, Tennyson, Yeats, Lawrence, Lessing, and Beckett. <i>Prereq. ENG U111 or equivalent.</i></p>
<p>ENG U112 College Writing 2 4 SH Designed for students who entered the University under the quarter system and must fulfill the second half of their first-year requirement while on the semester system. Requires students to write multiple drafts and emphasizes the writing process as well as the quality of the finished product. Students work with texts in various genres and use these texts as occasions for analytical writing. Students must keep a portfolio of their work.</p>	<p>ENG U223 Survey of American Literature 1 4 SH Surveys the major American writers and major literary forms and works from the colonial period to the Civil War. Includes works by such writers as Bradstreet, Taylor, Cooper, Poe, Hawthorne, Douglass, Stowe, Melville, and Emerson. <i>Prereq. ENG U111 or equivalent.</i></p>
<p>ENG U150 Introduction to Language and Linguistics 4 SH Introduces students to their unconscious linguistic knowledge about sentence structure (syntax), meaning (semantics), word forms (morphology), and speech sounds (phonology). Examines other issues related to language such as the black English/standard English debate, women's and men's language, "talking" chimpanzees, "talking" computers, and the nature/nurture controversy.</p>	<p>ENG U224 Survey of American Literature 2 4 SH Surveys the major American writers and major literary forms and works from the Civil War to the mid-twentieth century. Includes works by such writers as Whitman, Dickinson, Twain, James, Hemingway, Fitzgerald, Faulkner, and Wright. <i>Prereq. ENG U111 or equivalent.</i></p>
<p>ENG U165 Poetry 4 SH Involves close reading of selected poems, study of critical terms, and practice in different critical approaches to poetry; examines techniques for reading a variety of poetic texts. <i>Prereq. ENG U111 or equivalent.</i></p>	<p>ENG U226 Backgrounds in English and American Literature 4 SH Examines in translation Greek, Roman, and biblical literature as background for literary study. Emphasizes the development of myth, genre, and theme. Readings include Homer, Virgil, Ovid, the most influential parts of the Bible, and Dante. <i>Prereq. ENG U111 or equivalent.</i></p>
<p>ENG U166 Fiction 4 SH Involves close reading of selected novels and short stories, study of critical terms, and practice in different critical approaches to fiction. <i>Prereq. ENG U111 or equivalent.</i></p>	<p>ENG U277, ENG U278, ENG U279 1 SH each Honors Adjunct Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>
<p>ENG U167 Drama 4 SH Involves close reading of selected plays, study of critical terms, and practice in different approaches to drama. <i>Prereq. ENG U111 or equivalent.</i></p>	<p>ENG U300 Writing Practicum 4 SH Designed to help students expand their reading and writing strategies before they take the Advanced Writing in the Disciplines course. Students focus on the convention of academic discourses, particularly with their chosen field of study, and write short analytical essays that lead to and are incorporated in a final long paper. It is primarily designed for transfer students who have taken their first year writing courses at other institutions. <i>Special placement on diagnostic examination.</i></p>
<p>ENG U220 Survey of English Literature 1 4 SH Surveys the major British writers and major literary forms and works from the Middle Ages to the end of the eighteenth century. Includes works by such writers as Chaucer, Spenser, Shakespeare, Milton, Pope, and Swift. <i>Prereq. ENG U111 or equivalent.</i></p>	<p>ENG U301 Advanced Writing in the Disciplines 4 SH Provides writing instruction for students in the College of Arts and Sciences. Students develop an in-depth analytic or recommendation report about a focused topic related to their majors and/or their co-op or other personal or professional experiences. In a workshop setting, students evaluate scholarly and popular sources, practice a variety of professional and academic forms of writing, and develop expertise in audience analysis, critical research, peer review, and revision. Writing is guided in stages from initial topic exploration and a formal proposal through drafts and progress reports to a final polished report, presented</p>

in a bound portfolio with a cover letter, an abstract, and other writing samples. This course is sometimes offered in specialized sections; check course offerings booklets. *Prereq.* *ENG U111 or equivalent and 64 SH toward degree.*

ENG U302 Advanced Writing in the Technical Professions 4 SH
Provides writing instruction for students in engineering, computer science, management information systems, and related technical fields. Students develop an in-depth analytic or recommendation report about a focused topic related to their majors and/or their co-op or other personal or professional experiences. In a workshop setting, students evaluate scholarly and popular sources, practice a variety of professional and academic forms of writing and communication, and develop expertise in audience analysis, critical research, peer review, and revision. Writing is guided in stages from initial topic exploration and a formal proposal through drafts and progress reports to a final polished report, presented in a bound portfolio with a cover letter, an abstract, and other writing samples. *Prereq.* *ENG U111 or equivalent and 64 SH toward degree.*

ENG U303 Advanced Writing in the Environmental Professions 4 SH
Provides writing instruction for students in fields related to environmental studies. Students develop an in-depth analytic or recommendation report about a complex environmental concern related to their majors and/or their co-op or other personal or professional experiences. In a workshop setting, students evaluate scholarly and popular sources, practice a variety of professional and academic forms of writing and communication, and develop expertise in audience analysis, critical research, peer review, and revision. Writing is guided in stages from initial topic exploration and a formal proposal through drafts and progress reports to a final polished report, presented in a bound portfolio with a cover letter, an abstract, and other writing samples. *Prereq.* *ENG U111 or equivalent and 64 SH toward degree.*

ENG U304 Advanced Writing in the Business Administration Professions 4 SH
Provides writing instruction for students in business-related fields. Students develop an in-depth analytic or recommendation report about a focused topic related to their majors and/or their co-op or other personal or professional experiences. In a workshop setting, students evaluate scholarly and popular sources, practice a variety of professional and academic forms of writing and communication, and develop expertise in audience analysis, critical research, peer review, and revision. Writing is guided in stages from initial topic exploration and a formal proposal through drafts and progress reports to a final polished report, presented in a bound portfolio with a cover letter, an executive summary, an abstract, and other writing samples. *Prereq.* *ENG U111 or equivalent and 64 SH toward degree.*

ENG U305 Advanced Writing in the Criminal Justice Professions 4 SH
Provides writing instruction for students in criminal justice. Students develop an in-depth analytic or recommendation report about a focused topic related to their majors and/or their

co-op or other personal or professional experiences. In a workshop setting, students evaluate scholarly and popular sources, practice a variety of professional and academic forms of writing, and develop expertise in audience analysis, critical research, peer review, and revision. Writing is guided in stages from initial topic exploration and a formal proposal through drafts and progress reports to a final polished report, presented in a bound portfolio with a cover letter, an abstract, and other writing samples. *Prereq.* *ENG U111 or equivalent and 64 SH toward degree.*

ENG U306 Advanced Writing in the Health Professions 4 SH
Provides writing instruction for students in nursing, physical and respiratory therapy, pharmacy, athletic training, medical laboratory science, and related health fields. Students develop an in-depth analytic or recommendation report about a focused topic related to their majors and/or their co-op or other personal or professional experiences. In a workshop setting, students evaluate scholarly and popular sources, practice a variety of professional and academic forms of writing, and develop expertise in audience analysis, critical research, peer review, and revision. Writing is guided in stages from initial topic exploration and a formal proposal through drafts and progress reports to a final polished report, presented in a bound portfolio with a cover letter, an abstract, and other writing samples. *Prereq.* *ENG U111 or equivalent and 64 SH toward degree.*

ENG U319 Writing Workshop 4 SH
Focuses on student writing one long paper, often in conjunction with an assigned paper in another course, that is produced in a class booklet at the end of the term. Emphasizes the writing process: multiple drafts, revision, editing, and publication. *Prereq.* *By petition only.*

ENG U320 Technical Communication 1 4 SH
Introduces students to strategies and forms for workplace communication in a technological age. Emphasizes the production of texts in relation to organizational, social, and cultural contexts. *Prereq.* *ENG U111 or equivalent.*

ENG U321 Technical Communication 2 4 SH
Continues ENG U320. Explores strategies and forms for workplace communication, with attention to theories of rhetoric and technical communication. *Prereq.* *ENG U320 or permission of the instructor.*

ENG U322 Topics in Rhetoric 4 SH
Explores one of a range of topics in rhetorical theory or criticism, such as the rhetoric of science, visual rhetoric, rhetoric and cultural studies, rhetoric and law, or feminist rhetorical criticism. Students may repeat the course for credit when topics change. *Prereq.* *ENG U111 or equivalent.*

ENG U323 Topics in Technical Communication 4 SH
Focuses on specialized topics in technical communication, such as risk communication, usability, regulatory writing, or technology and literacy. Varies by semester. *Prereq.* *ENG U111.*

- ENG U324 Writing for Computer-Related Industries 4 SH
Introduces students to writing and editing professional-quality computer user documentation. Focuses on techniques for creating usable documents, including attention to text organization and visual elements. *Prereq. ENG U111.*
- ENG U337 Literary Interpretation 4 SH
Introduces students to a variety of interpretive methods by studying literary works in different genres—poetry, fiction, and drama—in conjunction with critical texts. *Prereq. ENG U111 or equivalent.*
- ENG U339 Topics in Literary Criticism 4 SH
Studies a specific problem, method, or school of literary criticism, such as structuralism or psychoanalysis. *Prereq. ENG U101 or equivalent.*
- ENG U350 Linguistic Analysis 4 SH
Focuses on the three core areas in the study of language in this workshop: syntax, morphology, and phonology. Examines the regularities that lie inside each language user's mind, with a slant toward "doing" linguistics: playing with data, analyzing it, and ultimately explaining it. *Prereq. ENG U150 or LIN U150.*
- ENG U372 Creative Writing 4 SH
Gives the developing writer an opportunity to practice writing various forms of both poetry and prose. Features in-class discussion of student work. *Prereq. ENG U111.*
- ENG U377 Poetry Workshop 4 SH
Offers an advanced workshop in writing and reading original student poetry. Students experiment in established poetic forms and compose their own work. *Prereq. ENG U111 or equivalent.*
- ENG U378 Fiction Workshop 4 SH
Requires students to produce and examine original fiction. Students experiment with writing techniques and critique one another's work. *Prereq. ENG U111 or equivalent.*
- ENG U379 Nonfiction Workshop 4 SH
Offers writers an opportunity to explore forms of nonfiction writing in a workshop environment. Features in-class discussion of student writing. *Prereq. ENG U111 or equivalent.*
- ENG U380 Topics in Writing 4 SH
Allows writers to hone their skills and develop their interests in different forms and subjects. Topics and modes vary each time the course is offered. *Prereq. ENG U111 or equivalent.*
- ENG U381 The Writing Process 4 SH
Provides students training in the teaching of writing along with reading in the professional literature of writing theory and instruction. Students tutor in the Writing Center and/or other venues as part of their course work. Ordinarily, students spend one day a week meeting in class with the instructor, and the rest of their time working and meeting with the instructor outside the classroom. Requires a final paper reflecting on students' experiences as teachers of writing. Fulfills the college's experiential education requirement for English majors. *Prereq. ENG U111 or equivalent.*
- ENG U382 Publication Arts 4 SH
Explores how to get published and how to get into the publishing business. Focuses on the process of authorship in any field (fiction, drama, poetry, medicine, law, or engineering) and in any format (books, journals, or newspapers). Examines print and electronic publishing, the process of writing and submitting work, and ways to increase acceptance as a writer and/or publication professional. Fulfills the college's experiential education requirement for English majors. *Prereq. ENG U111 or equivalent.*
- ENG U391 Topics in Film 4 SH
Studies a theme or problem (film and society, film and politics), a period in film history (American film from 1945 to the present), a film genre (the western, film noir), or a film director (Hitchcock, Coppola). *Prereq. ENG U111 or equivalent and sophomore standing or above.*
- ENG U394 Modern Film 4 SH
Studies a selection of major modern films from around the world from a thematic, cultural, and historical perspective. Special attention is given to political, social, ethical, and psychological issues, as well as to the way common human themes emerge in quite diverse cultures. Also covers the basic procedures of film interpretation. *Prereq. ENG U111 or equivalent.*
- ENG U395 American Film Survey 4 SH
Provides a survey history of American film from the silents to the present. Considers the internal history of the film industry and film art, as well as the relationship between film considered as a site of cultural debate and social history. Films studied include *Birth of a Nation*, *The Gold Rush*, *The Gold Diggers of 1933*, *Citizen Kane*, *Mildred Pierce*, *On the Waterfront*, *The Graduate*, and others. *Prereq. ENG U111 or equivalent.*
- ENG U396 Topics in Popular Culture 4 SH
Focuses on such topics as the soap opera, the western, and the police story; on a popular cultural activity; or on a popular culture perspective. *Prereq. ENG U111 or equivalent.*
- ENG U397 Topics in Fiction 4 SH
Studies a particular kind of fiction, such as the novella; a problem in fiction, such as the role of the narrator; a particular group of fiction writers; or a theme in fiction. *Prereq. ENG U111 or equivalent.*
- ENG U398 Topics in Genre 4 SH
Explores the characteristics of a particular literary form over time through works by various authors. *Prereq. ENG U111 or equivalent.*

- ENG U399 Topics in Literature 4 SH
Experiments with subjects and themes such as the censored novel, the Holocaust, or popular song lyrics. *Prereq. ENG U111 or equivalent.*
- ENG U406 Science Fiction 4 SH
Traces the development of various science fiction themes and approaches, from early man vs. machine and love/hate relations to alien close encounters of all kinds. Covers *Frankenstein* to most recent titles. *Prereq. ENG U111 or equivalent.*
- ENG U407 Topics in Science Fiction 4 SH
Focuses on a single writer or group of writers (such as Wells or writers of contemporary American science fiction), a theme (such as women in science fiction or the future city), or a unifying idea (such as time travel or utopia/dystopia). *Prereq. ENG U111 or equivalent.*
- ENG U408 The Modern Bestseller 4 SH
Explores the function of quest, romance, and adventure in a selection of contemporary best-selling fiction. *Prereq. ENG U111 or equivalent.*
- ENG U409 The Modern Novel 4 SH
Studies the major British and American novelists of the twentieth century. Considers theme and form in such authors as Lawrence, Woolf, Fitzgerald, Ellison, Doctorow, and Didion. *Prereq. ENG U111 or equivalent.*
- ENG U410 Modern Drama 4 SH
Studies the development of drama from realism to surrealism, from Ibsen to Beckett. *Prereq. ENG U111 or equivalent.*
- ENG U411 The Modern Short Story 4 SH
Studies the short story from Poe to the present, including such writers as Joyce and Kafka, Hemingway and Flannery O'Connor. *Prereq. ENG U111 or equivalent.*
- ENG U412 Contemporary Fiction 4 SH
Examines British and American writers from 1945 to the present, including such figures as Lessing, Burgess, Pynchon, Morrison, Kingston, and Barth. Emphasizes experimentalist and modernist authors. *Prereq. ENG U111 or equivalent.*
- ENG U414 The Black Novel 4 SH
Focuses on the black novelist's place in the history of American fiction. Special attention is given to Chesnutt, Toomer, Wright, Ellison, and contemporary novelists, and to their different perceptions of the black experience in America. *Prereq. Sophomore standing or above.*
- ENG U415 Black Poetry and the Spoken Word 4 SH
Focuses on the black poet's place in the history of American poetry. Considers black poetry as both written words and spoken words. *Prereq. Sophomore standing or above.*
- ENG U425 Literature and Law 4 SH
Investigates problems of crime and justice as reflected in literature from ancient to contemporary works. The secondary focus is the law itself as literature, such as explorations of case files and other legal material. Readings encourage students to discover the changing nature of the criminals—heroes or victims or villains—and to deal with the social, psychological, and political facts that define them. *Prereq. ENG U111 or equivalent.*
- ENG U426 Literature and Politics 4 SH
Explores how authors from Sophocles to Mailer represent the religious, moral, and ethical conflicts arising from the acquisition, use, and misuse of political power. Considers literature in several categories: utopian, which establishes a conflict between the ideal and the real; satirical, which threatens a power structure by exposing it to scorn; analytic, which describes the rise to and fall from power of individuals, parties, or states; and investigative, which takes the reader inside a power elite to observe its inner operations. Students examine the difference between the ideal of government and its reality. *Prereq. ENG U111 or equivalent.*
- ENG U427 The Literature of Science 4 SH
Examines historically the discovery methods and models of literature and science, exploring one or more of the following areas: the relationship of the methods and models of literature and science; the treatment of scientific methods and models in literature; and the use of literary devices, techniques, and traditions in scientific texts. Readings are drawn from historically significant scientific texts, literary texts, or some combination of these. *Prereq. ENG U111 or equivalent.*
- ENG U450 Syntax 4 SH
Offers an introduction to syntax, the structural rules of a language. Develops and tests syntactic theory, which, like other scientific theories, seeks to explain why things are the way they are. The question underlying the investigation is: How do the structures of language relate to the structure of the human mind? *Prereq. ENG U150 or LIN U150 is recommended.*
- ENG U452 Semantics 4 SH
Focuses on meaning and how it is expressed in language—through words, sentence structure, intonation, stress patterns, and speech acts. How do content, logic, and speakers' and listeners' assumptions affect what sentences can mean? In what ways is linguistic meaning determined by our perceptual system or our culture? *Prereq. ENG U150 or LIN U150 is recommended.*
- ENG U454 History of English 4 SH
Studies the development of modern English from Anglo-Saxon beginnings; effects of Scandinavian and Norman invasions; dialect geography; evolutionary changes, word formation, and borrowing; and origins of writing and problems of spelling. Readings include both formal and informal writings, literary selections, wills, journals, and private and public letters. *Prereq. ENG U150 or LIN U150 is recommended.*

ENG U456 Language and Gender	4 SH	ENG U520 American Novels 2	4 SH
Investigates the relationship between language and gender. Topics include how men and women talk; the significant differences and similarities in how they talk; why men and women talk in these ways; and social biases in the structure of language itself. A background in linguistics is not required. <i>Prereq. ENG U150 or LIN U150 is recommended.</i>		Studies the modern and contemporary American novel, considering such writers as Cather, Fitzgerald, Hemingway, Hurston, Faulkner, Bellow, Baldwin, and Morrison. <i>Prereq. ENG U111 or equivalent.</i>	
ENG U458 Topics in Linguistics	4 SH	ENG U572 Fantasy	4 SH
Examines closely one of a range of topics from the perspective of current linguistics: American dialectics, language and law, women's and men's language, words and word structures, or issues in linguistics and literature. <i>Prereq. ENG U150 or LIN U150 is recommended.</i>		Explores the theory and literary practice of fantasy, including the representation of dreams, nightmares, and borderline states of consciousness, in the work of writers such as Carroll, Poe, Kafka, and Tolkien. <i>Prereq. ENG U111 or equivalent.</i>	
ENG U477, ENG U478, ENG U479	1 SH each	ENG U577 Topics in Fantasy	4 SH
Honors Adjunct		Explores the theory and literary practice of fantasy, including the representation of dreams, nightmares, and borderline states of consciousness, in the work of writers such as Carroll, Poe, Kafka, and Tolkien. <i>Prereq. ENG U111 or equivalent.</i>	
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>		ENG U582 Children's Literature	4 SH
ENG U488 Film and Text	4 SH	Studies children's literature with special attention to such matters as genre theory, characteristic themes and moral concerns (such as gender roles or the problem of evil), and children's literature as a form of group socialization. <i>Prereq. ENG U111 or equivalent.</i>	
Studies either the similarities and differences between literary texts and film versions of those texts or the interrelations between film and literature as means of cultural expression during a specific historical period. For example, students might compare Doctorow's <i>Book of Daniel</i> to the film version, <i>Daniel</i> , or they might study books and movies of a period like the sixties that reflect the spirit of the era (<i>Catch-22</i> , <i>The Graduate</i>). <i>Prereq. ENG U111 or equivalent.</i>		ENG U584 Topics in Children's Literature	4 SH
ENG U489 Shakespeare on Film	4 SH	Focuses closely on a specific collection of stories (such as <i>Grimm's Fairy Tales</i>), on a specific genre (such as boys' books), on a specific issue (such as the problem of evil), or on children's literature as a form of group socialization. <i>Prereq. ENG U111 or equivalent.</i>	
Examines the various treatments of Shakespeare's plays on film. Treats the technical aspects of film and how these are used by directors to transfer Shakespeare's plays from the stage to the screen. <i>Prereq. ENG U111 or equivalent.</i>		ENG U588 Literature in Context	4 SH
ENG U511 English Drama 1	4 SH	Places writers in the context of a special theme; for example, students might discuss a group of writers influenced by their common interest in psychoanalysis, by their social consciousness, or by an interest in the settlement of America. <i>Prereq. ENG U111 or equivalent.</i>	
Surveys representative English drama, excluding Shakespeare, from <i>Everyman</i> to Goldsmith and Sheridan. Analyzes dramatic forms as well as the role of the Elizabethan theatres, dramatic conventions, audience content, and acting styles in Restoration farces. <i>Prereq. ENG U111 or equivalent.</i>		ENG U589 Psychology and Literature	4 SH
ENG U512 English Drama 2	4 SH	Concentrates on twentieth-century novels and short stories that stress individual behavior and motivation and reveal human mental and emotional processes. Includes such writers as Kafka, Woolf, Faulkner, Conrad, and Lawrence. <i>Prereq. ENG U111 or equivalent.</i>	
Surveys representative English drama of the nineteenth century through the present. Charts the development of the genre from the nineteenth century to the present and discusses themes and forms. <i>Prereq. ENG U111 or equivalent.</i>		ENG U600 Major Figure	4 SH
ENG U519 American Novels 1	4 SH	Examines in detail the work of one pre-1800 writer, such as Fielding or Spenser. <i>Prereq. ENG U111 or equivalent.</i>	
Focuses on the themes, forms, and techniques of major American novelists of the nineteenth and early twentieth centuries, such as Cooper, Hawthorne, Melville, Stowe, Twain, and James. <i>Prereq. ENG U111 or equivalent.</i>		ENG U605 Medieval English Literature	4 SH
		Surveys the major works of medieval English literature. Includes such works as <i>Sir Gawain</i> , <i>Piers Plowman</i> , and <i>Pearl</i> . <i>Prereq. ENG U111 or equivalent.</i>	

- ENG U606 Topics in Medieval Literature 4 SH
Examines a genre (such as romance or debate literature), a theme (such as alchemy or King Arthur), or other focused topics. *Prereq. ENG U111 or equivalent.*
- ENG U607 Chaucer 4 SH
Surveys the work of Chaucer, with emphasis on the *Canterbury Tales*. *Prereq. ENG U111 or equivalent.*
- ENG U608 Topics in Chaucer 4 SH
Examines closely a particular work or group of works (such as *Troilus and Criseyde*) or a theme (such as Chaucer's symbolism). *Prereq. ENG U111 or equivalent.*
- ENG U610 Sixteenth-Century English Literature 4 SH
Concentrates on sonnets, love lyrics, and narrative poetry principally by Wyatt, Sidney, Marlow, Spenser, and Shakespeare. *Prereq. ENG U111 or equivalent.*
- ENG U611 Shakespeare 4 SH
Covers a selection of the major plays of Shakespeare, including both tragedies and comedies. *Prereq. ENG U111 or equivalent.*
- ENG U612 Shakespeare's Comedies 4 SH
Studies the romantic comedies, problem comedies, and romances, ranging from *The Merchant of Venice* to *The Tempest*. *Prereq. ENG U111 or equivalent.*
- ENG U613 Shakespeare's Tragedies 4 SH
Studies the nature of the tragic hero, the questioning of social norms, and the landscape of chaos, ranging from *Julius Caesar* to *Coriolanus*. *Prereq. ENG U111 or equivalent.*
- ENG U614 Topics in Shakespeare 4 SH
Examines such focused topics as the history plays, Shakespeare in performance, the Shakespearean hero, or psychological approaches to Shakespeare. *Prereq. ENG U111 or equivalent.*
- ENG U617 Seventeenth-Century English Literature 4 SH
Examines major writers of the period, such as Bacon and Jonson, Donne and Herbert, and Milton and Dryden. *Prereq. ENG U111 or equivalent.*
- ENG U618 Milton 4 SH
Concentrates on Milton's *Paradise Lost*, with supplementary readings in his minor poetry and prose. *Prereq. ENG U111 or equivalent.*
- ENG U619 Eighteenth-Century English Literature 4 SH
Surveys the Augustan age of comic masterpieces. Includes such major writers as Pope, Addison, Steele, Swift, Goldsmith, Burns, Johnson, and Boswell. *Prereq. ENG U111 or equivalent.*
- ENG U620 Topics in Eighteenth-Century English Literature 4 SH
Examines closely a single writer or group of writers (such as Fielding or the essayists), a genre (such as satire), a theme (such as reason and madness), or other focused topics. *Prereq. ENG U111 or equivalent.*
- ENG U621 Romantic Poetry 4 SH
Surveys the development of English Romantic poetry, in both its lyric and longer forms, in Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats. Emphasizes problems of belief and the relationship of the individual to the surrounding world of natural, social, and historical process. *Prereq. ENG U111 or equivalent.*
- ENG U624 Victorian Literature 4 SH
Surveys the major writers and issues of Victorian England, considering such authors as Tennyson and Browning, Dickens and the Brontës, G. M. Hopkins, and Oscar Wilde. *Prereq. ENG U111 or equivalent.*
- ENG U625 Topics in Victorian Literature 4 SH
Examines closely a single writer or group of writers such as Arnold or the Brontës; or a theme such as decadence or Victorian literature's engagement with industrialization; or a genre such as the Victorian long poem.
- ENG U626 Nineteenth-Century British Fiction 4 SH
Studies theme and form in the major English novels of the nineteenth century, considering such authors as the Brontës, Charles Dickens, George Eliot, and Thomas Hardy. *Prereq. ENG U111 or equivalent.*
- ENG U630 Major Twentieth-Century British Novelists 4 SH
Introduces students to British fiction from Joseph Conrad to John Fowles, including such writers as D. H. Lawrence, Virginia Woolf, and others less well known. The aim of the course is to show how novels as artistic creations shape their own worlds while helping us to understand ourselves. *Prereq. ENG U111 or equivalent.*
- ENG U631 Twentieth-Century English Literature 4 SH
Surveys the work of twentieth-century English authors in both poetry and prose, including such writers as William Butler Yeats, D. H. Lawrence, W. H. Auden, Doris Lessing, and Iris Murdoch. *Prereq. ENG U111 or equivalent.*
- ENG U654 Seminar in Linguistics 4 SH
- ENG U656 Seminar in Linguistics 4 SH
Explores important topics in language and linguistics, such as style and meaning or language and gender. Emphasizes independent research in a seminar setting. *Prereq. ENG U150 or LIN U150 and junior or senior standing.*
- ENG U661 Early American Literature 4 SH
Examines American literature of the colonial and federal periods, including such writers as Bradford, Bradstreet, Taylor, Edwards, Franklin, Wheatley, Irving, and Bryant. *Prereq. ENG U111 or equivalent.*
- ENG U663 Early African-American Literature 4 SH
Surveys the development and range of black American writers, emphasizing poetry and prose from early colonial times to the Civil War. *Prereq. ENG U111 or equivalent.*

ENG U665 The American Renaissance	4 SH	ENG U675 Gay and Lesbian Literature	4 SH
Studies the nineteenth-century development of an American national literary tradition in the context of democratic and romantic attitudes toward experience, nation formation, and national crisis. Includes such writers as Emerson and Thoreau, Hawthorne, Fuller, and Melville. <i>Prereq. ENG U111 or equivalent.</i>		Studies poetry and fiction that has as its central theme gay and lesbian experience as seen from the perspectives of various eras. Examines authors from premodern and modern eras as well as contemporary writers. <i>Prereq. ENG U111.</i>	
ENG U667 American Realism	4 SH	ENG U676 Contemporary American Literature	4 SH
Examines the realistic tradition in American literature, including local color and native humor, from the end of the Civil War to the beginning of the twentieth century. Includes such writers as Twain, James, Harding Davis, Howells, Crane, Chesnutt, and Norris. <i>Prereq. ENG U111 or equivalent.</i>		Studies major movements in American poetry and fiction since 1945. Considers such poets as Plath, Ginsberg, and Ashbery, and such novelists as Morrison, Pynchon, and Vonnegut. <i>Prereq. ENG U111 or equivalent.</i>	
ENG U668 Modern American Literature	4 SH	ENG U677, ENG U678, ENG U679	1 SH each
Studies major developments in American poetry and fiction from 1900 to 1945. Considers such poets as Frost, Eliot, Stevens, and Moore, and such novelists as Hemingway, Faulkner, Fitzgerald, and Porter. <i>Prereq. ENG U111 or equivalent.</i>		Honors Adjunct	
ENG U670 Modern African-American Literature	4 SH	Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	
Surveys the development and range of black American writers in poetry and prose from the post-Civil War period to the present. <i>Prereq. ENG U111 or equivalent.</i>		ENG U680 The Bible	4 SH
ENG U671 Multiethnic Literature of the U.S.	4 SH	Studies books of both the Old Testament and the New Testament as literature and as history. <i>Prereq. ENG U111 or equivalent.</i>	
Explores contemporary literature by and about writers from distinctive American ethnic groups (for example, Native, Asian, African, Latino/Latina, Jewish, Italian, or Arab). Features a variety of works that reflect an evolving recognition of the artistically and culturally diverse nature of American literature. <i>Prereq. ENG U111 or equivalent.</i>		ENG U681 World Literature 1	4 SH
ENG U672 Asian-American Literature	4 SH	Surveys world literature from the time of the Greeks through the Renaissance, from Homer to Cervantes. <i>Prereq. ENG U111 or equivalent.</i>	
Introduces students to significant American writers of Chinese, Japanese, Korean, Filipino, South Asian, and Southeast Asian descent. Emphasizes works published since the 1960s. Pays close attention to prevalent themes, socio/historical contexts, and literary artistry. <i>Prereq. ENG U111.</i>		ENG U682 World Literature 2	4 SH
ENG U673 U.S. Latino/Latina Literature	4 SH	Surveys world literature from the Renaissance through the modern period, from Voltaire to Brecht. <i>Prereq. ENG U111 or equivalent.</i>	
Introduces students to significant American authors from various Spanish-speaking origins, that is, Mexican, Cuban, Dominican, Puerto Rican, and Central and South American. Explores the use of both traditional and experimental forms and themes such as gender roles, bilingualism, and cultural identity. Examines works written in English and emphasizes works published since the 1960s. <i>Prereq. ENG U111.</i>		ENG U687 Modern Poetry	4 SH
ENG U674 American Indian Literature	4 SH	Studies the modernist tradition in American and British poetry. Considers such writers as Yeats, Hardy, Frost, Eliot, Stevens, Pound, Williams, and Cummings. <i>Prereq. ENG U111 or equivalent.</i>	
Introduces students to significant American Indian authors and critics. Emphasizes works published since the Native American renaissance of the late 1960s. Addresses ongoing critical debates, such as the connection between Native traditions and contemporary American Indian literature. <i>Prereq. ENG U111.</i>		ENG U688 Contemporary Poetry	4 SH
		Studies developments in British and American poetry since 1945. Includes such writers as Plath, Ginsberg, Lowell, Bly, Ashbery, and Heaney. <i>Prereq. ENG U111 or equivalent.</i>	
		ENG U690 The City in Literature	4 SH
		Examines the city in literature as it has been depicted from ancient times to the present, from Plato to Barthelme. Discusses such themes as the city as a locus of evil, the city as a place of possibility, and the city as a center of art and an influence on creative form in an interdisciplinary fashion. <i>Prereq. ENG U111 or equivalent.</i>	
		ENG U691 Gender Roles in Literature	4 SH
		Investigates the relationship between gender roles and literary portrayals. Studies male and female writers in a culturally comparative perspective. <i>Prereq. ENG U111 or equivalent.</i>	

ENG U694 Topics in Experiential Education 4 SH
Explores such topics as writing about place, writing about people, or reviewing and writing about culture. Combines class meetings, reading assignments, and individual meetings with the instructor with learning experiences outside the classroom. *Prereq. ENG U111 or equivalent.*

ENG U710 Junior/Senior Seminar 4 SH
Explores an important topic in literature, such as the writer and the audience, the canon and its revisions, or the historical relations between feminism and the novel. Enrollment preference is given to English majors needing the course to complete the major. *Prereq. ENG U111 or equivalent and junior or senior standing.*

ENG U921 Directed Study 1 SH
ENG U922 Directed Study 2 SH
ENG U923 Directed Study 3 SH
ENG U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

ENG U940 Internship Practicum 4 SH
Offers students internships under the direction of a faculty member in such areas as publishing, education, or business and technical writing. Students are required to produce both a portfolio of professional work and a final paper reflecting on their internship experience. Fulfills the college's experiential education requirement for English majors. *Prereq. ENG U111.*

ENG U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

ENG U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. ENG U970 and honors program participation.*

ENTREPRENEURSHIP AND SMALL BUSINESS MANAGEMENT

COLLEGE OF BUSINESS ADMINISTRATION

ENT U201 Entrepreneurship 4 SH
Designed as an introductory course for entrepreneurship majors and as an overview course for all others, including non-CBA students. Covers the importance of entrepreneurship, the characteristics of entrepreneurs, the entrepreneurship process, and the alternatives for entrepreneurial careers. Career paths include starting a new business, acting as a venture financier, doing corporate venturing, and embarking on social venturing.

Types of start-ups include growth ventures, small and medium enterprises, and microbusinesses. Helps students decide whether they want to become entrepreneurs.

ENT U277, ENT U278, ENT U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ENT U301 Opportunity Assessment 4 SH
and Entrepreneurial Market
Covers idea generation, feasibility analysis, and opportunity assessment to determine whether a business idea is worth pursuing. The key question addressed is how do you start a company that, from the beginning, is market oriented and focused on what customers are willing to buy. *Prereq. ENT U201.*

ENT U401 Management of Small and Medium Enterprises 4 SH
Explores the key principles and practices needed to start and bring a business, based on a good idea, through its first stage of growth. Covers alternative approaches to business entry, initial team building, establishing control systems, cash flow management, legal matters, and other operational issues. *Prereq. ENT U201.*

ENT U477, ENT U478, ENT U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ENT U501 Growth Venture Creation 4 SH
Comprises the senior capstone course for entrepreneurship majors. Covers the issues in creating a company that go through multiple rounds of financing in order to become a successful large company. Topics include managing growth, writing business plans, raising money, and formulating exit strategies. *Prereq. ENT U301 and ENT U401.*

ENT U677, ENT U678, ENT U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ENT U921 Independent Study 1 SH
ENT U922 Independent Study 2 SH
ENT U923 Independent Study 3 SH
ENT U924 Independent Study 4 SH
Allows students who have received approval to undertake independent study in lieu of any course required in the various concentrations. Students present proposals to an Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the

supervising faculty member under whose direction the study takes place. A copy of the final report prepared by the student is presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from concentration coordinators. *Prereq. Permission of instructor.*

ENT U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

ENT U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. ENT U970 and honors program participation.*

ENVIRONMENTAL STUDIES

COLLEGE OF ARTS AND SCIENCES

ENV U100 College: An Introduction 1 SH
Intended for first-year students in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

ENV U115 Environmental Science 4 SH
Focuses on the complex mix of interlocking problems that are reaching crisis levels on Earth. Topics include population, resources, environmental degradation, and pollution. Focuses on food and land resources; air, soil, and water resources and pollution; and energy alternatives. Some emphasis is placed on culture, politics, world views, ethics, and economics.

ENV U300 Special Topics in Environmental Studies 4 SH
Studies various topics on environmental issues.

ENV U477, ENV U478, ENV U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ENV U523 Soil Science 4 SH
Provides a description and evaluation of the physical, chemical, and biological properties of soils. Includes soil formation, soil types, and processes that occur in soil including the importance

of these processes for soil productivity and the management of soil. Also covers sources, reactions, transports, and fates of chemical species in soils and associated water and air environments, as well as the chemical behavior of elements and compounds and the phenomena affecting natural and anthropogenic materials in soils. *Prereq. GEO U201 and CHM U101 or CHM U211.*

ENV U677, ENV U678, ENV U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

ENV U700 Senior Thesis 4 SH
Offers students preparation of an undergraduate thesis under faculty supervision. *Prereq. Senior standing and completion of an approved experiential activity.*

ENV U921 Directed Study 1 SH
ENV U922 Directed Study 2 SH
ENV U923 Directed Study 3 SH
ENV U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

ENV U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

ENV U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. ENV U970 and honors program participation.*

FINANCE AND INSURANCE

COLLEGE OF BUSINESS ADMINISTRATION

FIN U201 Financial Management 4 SH
Develops the financial skills and logical thought processes necessary to understand and discuss financial policy decisions in a global economy. Specific objectives include developing an understanding of the time value of money; using financial statements in decision making; and understanding the nature of financial markets, the cost of capital, valuation of stocks and bonds, management of short-term assets, short-term and long-term financing, lease financing, capital markets, multinational financial management, and special topics in financial management. The impact of legal, social, technological, and ethical

considerations on efficient economic outcomes is also stressed. A financial calculator is required and computer spreadsheet skills are developed. *Prereq. ACC U201.*

FIN U277, FIN U278, FIN U279 1 SH each
Honors Adjunct

Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

FIN U301 Corporate Finance 4 SH

Develops the skills to make and implement financial policy decisions in a global economy. Specific objectives include developing an understanding of financial analysis; company valuation; capital markets; cost of capital; capital asset pricing and risk measurement; short- and long-term financial policies; working capital management; multinational financial management; and special topics including lease financing, debt refunding, mergers and acquisitions, and bankruptcy and restructuring. Offers opportunities to consider many broader issues including the relevance of globalization, the world economy, technological advances, and legal, social, and ethical issues related to the practice of corporate finance and business. Written and oral communications skills and teamwork are also stressed. Cases and spreadsheets are used extensively. *Prereq. FIN U201 and MSC U201.*

FIN U303 Investments 4 SH

Focuses on investment management as the study of risk and return of financial securities and real assets. Students design and assess models that evaluate investments while recognizing the constraints of the real world. Explores domestic and international financial markets and the securities traded therein. Discusses techniques for valuation of financial assets. Analyzes qualitative concepts such as market efficiency, intrinsic value, and risk. Provides the ability to build unique valuation models to suit the particular investment alternative that students wish to scrutinize. Also stresses portfolio construction, management, and protection. At the end of the semester, students design a portfolio commensurate with stated objectives and consider actions that maintain focus on that objective. Students should also be able to assess the performance of a portfolio. *Prereq. FIN U201 and MSC U201.*

FIN U310 Working Capital Management 4 SH

Examines strategies and analytical approaches to managing current assets and current liabilities. Explores corporate cash management under changing money market conditions. Discusses the use of interest-rate futures and working capital management in a multinational context. Provides a summary overview of entrepreneurial finance, with a focus on small businesses, corporate ventures, and intrapreneurship. Applies knowledge of corporate finance in the context of starting, acquiring, managing, and divesting a business or a business unit within a corporation. Topics include analyzing the financial needs of new ventures, exploring sources of financing, managing decline, determining valuation, and reviewing exit strategies. *Prereq. FIN U201.*

FIN U312 Issues in Corporate Governance 4 SH

Examines the nature of conflicts over control of the corporation. Applies modern finance theory and practice to the issues raised and draws on seminal works in the finance and economics literatures that influence the current debate in this area. Discusses legal and ethical considerations that are especially important in corporate-control issues. Uses cases involving well-known takeovers of the 1980s as well as current hostile takeover battles to illustrate the theories discussed. *Prereq. FIN U201.*

FIN U314 Management of Financial Institutions 4 SH

Studies the decision-making problems faced by financial institutions, such as commercial banks, savings and investment institutions, and finance companies when viewed as competitive, profit-seeking business entities. Topics include the nature and scope of the capital markets confronting institutions, specialized problems regarding the sources and uses of funds of financial institutions, the nature of competition, the regulation of financial institutions, and strategic policy planning of financial institutions. *Prereq. FIN U201.*

FIN U320 International Financial Management 4 SH

Introduces international financial markets including balance of payments, history of the international monetary system, exchange-rate determination, foreign-exchange-exposure hedging strategies, and international capital markets. Examines how the financial strategies and policies of multinational corporations differ from domestic corporations and how financial management is utilized in an international setting to achieve corporate goals. *Prereq. FIN U201.*

FIN U410 Valuation and Value Creation 4 SH

Explores recent developments in financial management and financial analysis through the use of modern finance theory to make capital allocation decisions that lead to long-run value maximization for the corporation. Focuses on applications and financial model building. Examines risk analysis by building spreadsheet models for valuation and risk-analysis applications. Utilizes valuation analysis models to merge financial, corporate, and business strategies to measure and manage corporate value. Develops an understanding of the mechanics of the valuation process, along with an understanding of the drivers of value and development of strategies for value creation. Topics covered are relevant to value consultants, corporate managers, and securities analysts. *Prereq. FIN U201 and junior or senior standing; FIN U301 is recommended.*

FIN U477, FIN U478, FIN U479 1 SH each
Honors Adjunct

Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

<p>FIN U512 Financial Risk Management 4 SH Explores the concepts of financial futures, options on financial futures, and listed options markets as developed to help corporations and financial institutions manage risk. Topics include mechanics of these markets, techniques that can hedge risk exposure, tracing methods, and current developments in the field. <i>Prereq. FIN U303.</i></p>	<p>legislators to reexamine fundamental beliefs regarding the nature of the publicly held corporation. While applying modern finance theory and practice to understand the issues raised, the course also draws on seminal works in finance and economics literature that influence current debates in this area. Addresses the legal and ethical considerations especially important in corporate control issues. Uses cases involving well-known takeovers of the 1980s as well as current hostile takeover battles to illustrate the theories discussed. <i>Prereq. Honors program participation.</i></p>
<p>FIN U516 Real Estate Finance 4 SH Surveys the field of real estate including principles of real estate law, transactions brokerage, management, development, valuation, taxation, finance, and investment. Provides a framework of real estate finance and investment, in both theory and practice. Examines all aspects of real estate financing including the primary and secondary mortgage markets, real estate financial institutions, regulations, and mortgage-backed securities. Analyzes the return, risk, and various strategies in real estate investments with financial methods and techniques. Uses case discussions, spreadsheet analysis, and investment projects to make learning effective. <i>Prereq. FIN U201.</i></p>	<p>FIN U608 Advanced Financial Strategy 4 SH Covers strategic financial decision making in dynamic and technology-driven organizations operating in domestic and international settings. Through case studies, discussions with senior financial executives, and student projects, students gain insight into capital investing and financing decisions in the new economy. An analytical paradigm linking business strategy, financial management, and valuation is utilized to explore financial decision making throughout the life cycle of companies, intended to optimize shareholder value creation. Topics include fundamental financial analysis, capital budgeting under conditions of high risk and uncertainty, start-up financing, creative financing, mega-mergers, risk management, and valuation. <i>Prereq. Honors program participation.</i></p>
<p>FIN U518 Risk Management and Insurance 4 SH Emphasizes the functional area of corporate risk management. Covers such areas as organizing and controlling the risk management function; identifying, measuring, controlling, and financing risk; selecting the best method of risk treatment; and implementing and monitoring risk management. Topics of exposure analysis include property, liability (public, employer, products, officers and directors, and professionals), income, and extraordinary expense losses. Covers treatment methods such as self-insurance, offshore captive, retention groups, and commercial insurance. Includes recent developments such as tort reform integration of risk management with modern financial theory, as well as implications and analysis of recent tax reforms. <i>Prereq. FIN U201.</i></p>	<p>FIN U677, FIN U678, FIN U679 1 SH each Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>
<p>FIN U602 Turnaround Management 4 SH Examines strategies for identifying companies likely to fail and selecting and implementing remedial actions. Topics include business turnarounds, troubled companies, workouts, bankruptcies, and liquidations, using case studies and readings. Students evaluate a turnaround plan. <i>Prereq. Honors program participation.</i></p>	<p>FIN U921 Directed Study 1 SH FIN U922 Directed Study 2 SH FIN U923 Directed Study 3 SH FIN U924 Directed Study 4 SH Allows students who have received approval to undertake independent study in lieu of any course required in the various concentrations. Students present proposals to an Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study takes place. A copy of the final report prepared by the student is presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from concentration coordinators. <i>Prereq. Permission of instructor.</i></p>
<p>FIN U604 Fixed-Income Securities 4 SH Exposes students to the theory, application, and evidence concerning highly sensitive interest-rate products. Teaches recent developments in pension fund management, asset/liability management, duration matching, "gap" management, and other important issues confronting domestic and international financial and corporate management. Offers students the opportunity to learn how to customize a risk management program. <i>Prereq. Honors program participation.</i></p>	<p>FIN U970 Junior/Senior Project 1 4 SH Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i></p>
<p>FIN U606 Issues in Corporate Control 4 SH Examines the nature of conflicts over control of the corporation, which often erupt as proxy fights or hostile takeover attempts. Such conflicts cause scholars, managers, shareholders, and</p>	

FIN U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq.* FIN U970 and honors program participation.

GENERAL ENGINEERING

COLLEGE OF ENGINEERING

GE U100 Introduction to the Study of Engineering 1 SH
 Presents an introduction to the various disciplines of engineering and strategies for success in the classroom, within the profession, and within the University community. Provides an initial orientation to engineering cooperative education. Covers the support services provided by both college and University and explores the richness of our community's diversity. Defines diversity, and offers students the opportunity to study and understand diverse cultures and communities in the academic environment. Oral presentations are required.

GE U110 Engineering Design 4 SH
 Presents the engineering design process using case studies for a variety of engineering disciplines. Develops problem-solving skills used in engineering design. Introduces students to the use of spreadsheet tools to solve engineering problems including data reduction, and visualization of data and functions. Design topics include problem formulation and specification, creativity, evaluation tools, patents, ergonomics, system design, manufacturing, ethics in engineering, and presentation techniques. Presents engineering graphics focusing on developing three-dimensional visualization skills and computer-aided design (CAD) application. Students develop an original design solution to a technical problem as a term project.

GE U111 Engineering Problem Solving and Computation 4 SH
 Uses a structured approach to solve engineering problems. Draws applications from a variety of engineering disciplines, which serve as a tool for introducing students to engineering analysis and design. Introduces a math application package for matrix applications and various real-life engineering problems. Includes the design of problem-solving algorithms using a high-level programming language.

GE U300 Introduction to Engineering Co-op Education 1 SH
 Provides students preparation for the first co-op experience. Focuses on skills that provide a basis for successful co-op engagement including expectations and requirements; an introduction to professional credentials; résumé construction; self-assessment and goal setting; interviewing; professional and co-op ethics; issues of diversity in the workplace community; academic planning and decision making; and an introduction to career portfolios. *Prereq.* GE U100.

GE U500 Professional Issues in Engineering 1 SH
 Provides students with an opportunity to reflect on both academic and co-op experiences in the context of planning for the senior year and beyond. Issues include professional and ethical issues; resolving ethical conflicts; awareness of engineers as professionals in a diverse world; strengthening decision-making skills; career portfolios; and lifelong learning needs, goals, and strategies. Students reflect upon issues of diversity from their experience in the University and in their cooperative education placements. Explores the role of different work and learning styles and diverse personal characteristics on the workplace and the classroom. Professional issues include impact of the cultural context, both in the United States and around the world, of the client, government relations, and workplace. *Prereq.* Junior or senior standing.

GEOLOGY

COLLEGE OF ARTS AND SCIENCES

GEO U100 College: An Introduction 1 SH
 Intended for first-year students in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

GEO U102 Marine Resources 4 SH
 Provides a qualitative and quantitative survey of renewable and nonrenewable resources from the sea. Topics include coral reefs, shellfish, marine mammals, sharks, sport and recreational fishing, clams, lobsters, shrimp, toxic seafood, energy from the ocean, ocean pollution, shore erosion, beaches, coastal zone recreation, marine law, and law of the sea.

GEO U104 Physical Oceanography 4 SH
 Provides a description of the physical properties and composition of seawater, waves, tides, and ocean currents. Discusses how these properties are measured by oceanographers and how they influence the earth's environment and climate.

GEO U106 Biological Oceanography 4 SH
 Covers the productivity of plant and animal life in the various zones of the ocean and the growing economic importance of the oceans as a source of food for the expanding world population.

GEO U108 New England Fisheries Resources 4 SH
 Provides an overview of the fisheries industry of New England. Emphasizes environmental factors controlling the distribution, quality, and abundance of fisheries resources. Discusses the methods and the effects of direct human utilization of the resource as well as the effects of pollution and habitat modification.

<p>GEO U110 Geology of Oceans and Coasts 4 SH Examines the relationship between the form of the ocean basins and their margins, and the major processes forming them. Emphasizes local landforms including New England beaches, spits, barrier islands, and the continental shelf.</p> <p>GEO U112 Environmental Geology 4 SH Covers the causes and effects of problems resulting from human interaction with the earth and geologic processes. Topics include volcanoes, earthquakes, river flooding, soil erosion, groundwater pollution, landslides, and coastal erosion. Emphasizes land-use planning techniques to minimize environmental problems.</p> <p>GEO U114 Natural Disasters and Catastrophes 4 SH Provides an overview of what we know about the causes, locations, and effects of some of the most important natural disasters such as earthquakes, floods, and hurricanes. Also examines how loss of life and property damage can be minimized by implementing geologic knowledge. Briefly examines less common but possibly more devastating catastrophes such as large volcanic eruptions, large meteorite impacts, and rapid climate change.</p> <p>GEO U115 Environmental Science 4 SH Focuses on the complex mix of interlocking problems that are reaching crisis levels on Earth. Topics include population, resources, environmental degradation, and pollution. Focuses on food and land resources; air, soil, and water resources and pollution; and energy alternatives. Some emphasis is placed on culture, politics, worldviews, ethics, and economics.</p> <p>GEO U116 Global Climate Change 4 SH Covers the geologic history of the last ice age. Discusses the causes of extreme climate changes during the last fifty million years. Examines the landforms and sediments created by past ice sheets in North America and Europe.</p> <p>GEO U118 Planetary Astronomy 4 SH Focuses on astronomy of the solar system. Topics include description of the planets and other objects with discussion of how our understanding has evolved from the days of naked-eye observation to the present day of interplanetary probes.</p> <p>GEO U120 Weather and Climate 4 SH Discusses the patterns and processes that combine to produce our daily weather and how weather integrates over time to define climate. Identifies natural and human-made causes of climate change.</p> <p>GEO U122 Age of Dinosaurs 4 SH Utilizes evidence from the sedimentary rock record of the Mesozoic Era to interpret significant biological and physical events in Earth history. Changes in the earth's landscape due to variations in climate, mountain building, and sea level provide the background for detailed consideration of the history of Mesozoic life. A particular focus of this biological history is the evolution, classification, paleoecology, and extinction of the dinosaurs.</p>	<p>GEO U200 Dynamic Earth 4 SH Offers a systematic study of the materials and systems comprising the earth. Emphasizes the processes that form, transport, alter, and destroy rocks, as well as the nature and development of landscape. Plate tectonics theory is introduced as a guiding paradigm in geology.</p> <p>GEO U201 Lab for GEO U200 1 SH Accompanies GEO 200. Covers exercises pertaining to mineral and rock identification, and topographic and geologic map interpretation. Required for environmental geology and geology majors. <i>Prereq. GEO U200 can be taken as a prerequisite or a corequisite for this course.</i></p> <p>GEO U205 Physical Geography 4 SH Introduces physical geography for students in history, political science, economics, or other social sciences who intend to pursue a career in education. <i>Prereq. Permission of the instructor.</i></p> <p>GEO U220 History of Earth and Life 4 SH Traces biological and physical development of the earth over the past 4.6 billion years using evidence preserved in rocks. A primary goal is to understand how geologists interpret events that occurred far in the geologic past. Topics include the origin of the earth and life, the evolution of life, and the causes and effects of major extinction events, the causes and results of mountain building and plate tectonics, and climate change over Earth history.</p> <p>GEO U221 Interpreting Earth History 1 SH Focuses on students using sedimentary rocks, fossils, and geologic maps and stratigraphic sections to record and to interpret events in Earth history.</p> <p>GEO U277, GEO U278, GEO U279 1 SH each Honors Adjunct Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p> <p>GEO U300 Advanced General Geology 4 SH Offers an introduction to new and advanced concepts, theories, and hypotheses in general geology through discussions, research papers, and individual projects. <i>Prereq. Permission of the instructor; GEO U200 can be taken as a prerequisite or a corequisite for this course.</i></p> <p>GEO U310 Earth Materials 5 SH Describes the physical and chemical characteristics of common rock-forming minerals as seen in pure specimens and as constituents in rocks. Soil, clay, and optical mineralogy are also introduced. <i>Coreq. GEO U311. Prereq. Two semesters of chemistry.</i></p> <p>GEO U311 Lab for GEO U310 0 SH Accompanies GEO U310. Covers topics from the course through various experiments. <i>Coreq. GEO U310.</i></p>
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<p>GEO U320 Igneous Petrology and Volcanology 5 SH Discusses the origin and nature of igneous rocks with special emphasis on physical volcanology. <i>Coreq. GEO U321. Prereq. GEO U200, GEO U201, and GEO U310.</i></p> <p>GEO U321 Lab for GEO U320 0 SH Accompanies GEO U320. In the lab, rock specimens will be studied in hand specimen and in thin section. <i>Coreq. GEO U320.</i></p> <p>GEO U324 Optical Crystallography 5 SH Investigates the interaction of light and crystal structures utilizing the polarizing microscope. Emphasizes the microscopic identification of minerals on the basis of their optical properties. <i>Coreq. GEO U325. Prereq. GEO U201 and GEO U310.</i></p> <p>GEO U325 Lab for GEO U324 0 SH Accompanies GEO U324. Emphasizes lab exercises that utilize the polarizing microscope to examine minerals in thin sections. <i>Coreq. GEO U324.</i></p> <p>GEO U326 Petrography 5 SH Covers the description and identification of rocks, minerals, and textures viewed in thin section with a polarizing microscope. Interpretations of textures and mineral assemblages are emphasized. <i>Coreq. GEO U327. Prereq. GEO U325.</i></p> <p>GEO U327 Lab for GEO U326 0 SH Accompanies GEO U326. Covers topics from the course through various experiments. <i>Coreq. GEO U326.</i></p> <p>GEO U340 Earth Landforms and Processes 5 SH Focuses on the origin and evolution of landscape features by processes operating at or near the earth's surface. Exercises introduce interpretation of air photos, topographic maps, remotely sensed data, and digital elevation models. <i>Coreq. GEO U341. Prereq. GEO U200.</i></p> <p>GEO U341 Lab for GEO U340 0 SH Accompanies GEO U340. Covers topics from the course through various experiments. <i>Coreq. GEO U340.</i></p> <p>GEO U390 Experiential Education Seminar 4 SH Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement. <i>Prereq. Permission of instructor.</i></p> <p>GEO U400 Field Geology 4 SH Develops field techniques and analysis in the approach, planning, and solution of geologic problems. Considers methods such as construction of geologic maps, measurement and description of stratigraphic and borehole sections, and description of rocks and geologic structures. Provides one hour of lecture per week combined with six hours of field research per week. Fulfills the college's experiential education requirement for geology majors. <i>Prereq. GEO U200 and GEO U201.</i></p>	<p>GEO U410 Geochemistry 4 SH Offers an evaluation of chemical processes important in the various geologic environments and their effects on the development of the lithosphere.</p> <p>GEO U412 Igneous and Metamorphic Petrology 5 SH Covers the origin and distribution of igneous and metamorphic rocks as interpreted from mineralogy, texture, chemistry, and field relationships. Emphasizes microscopic and hand specimen examination of rock samples. <i>Coreq. GEO U413. Prereq. GEO U326.</i></p> <p>GEO U413 Lab for GEO U412 0 SH Accompanies GEO U412. Emphasizes microscopic and hand specimen examination of rock samples. <i>Coreq. GEO U412.</i></p> <p>GEO U418 Geophysics 4 SH Studies the basic techniques of reflection and refraction seismology, gravity, and magnetic surveying, and the information they provide on the earth's interior. Discusses earthquakes. Emphasis is on near-surface exploration. <i>Prereq. GEO U200.</i></p> <p>GEO U477, GEO U478, GEO U479 1 SH each Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p> <p>GEO U500 Geology Seminar 4 SH Focuses on analysis of selected topics in geology for advanced study. Topics are selected from current areas of active research in the field. <i>Prereq. Permission of instructor.</i></p> <p>GEO U501 Geologic Field Seminar 4 SH Consists of two parts: an intensive classroom study of aspects of geology associated with a particular field setting, followed by an intensive field investigation. Examples include carbonate petrology and reef ecology followed by field studies in the Bahamas; glacial geology and volcanology followed by field studies in Iceland; or stratigraphy of the U.S. Southwest followed by field studies in the Grand Canyon. <i>Prereq. Permission of instructor.</i></p> <p>GEO U510 Environmental Planning 4 SH Examines aspects of surface runoff from geomorphic and hydrologic perspectives. Develops methods for description and calculation of major river and drainage basin processes, and applies the results to the planning process. Examines human modification of these systems including urbanization, dams, and channelization, and applies this information to an understanding of regulatory processes.</p> <p>GEO U520 Applied Hydrogeology 5 SH Covers the origin, distribution, and flow of groundwater in permeable sediments and bedrock; hydrological and geological characteristics of aquifers; regional flow systems emphasizing</p>
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rock structure, stratigraphy, and other aspects of the geological environment; principles of hydrogeologic mapping and analysis; and introduction to well testing and well hydraulics. An individual research project augments class activities. <i>Coreq. GEO U521. Prereq. GEO U200.</i>			
GEO U521 Lab for GEO U520 Accompanies GEO U520. Covers topics from the course through various experiments. <i>Coreq. GEO U520.</i>	0 SH	GEO U543 Lab for GEO U542 Accompanies GEO U542. Introduces invertebrate fossil morphology by study of fossil specimens of all major groups. Principles of paleoecology and evolutionary theory are illustrated by analysis of suites of fossil specimens. <i>Coreq. GEO U542.</i>	0 SH
GEO U523 Soil Science Provides a description and evaluation of the physical, chemical, and biological properties of soils. Includes soil formation, soil types, and processes that occur in soil including the importance of these processes for the soil productivity and the management of soil. Also covers sources, reactions, transports, and fates of chemical species in soils and associated water and air environments, as well as the chemical behavior of elements and compounds and the phenomena affecting natural and anthropogenic materials in soils. <i>Prereq. GEO U201 and CHM U101 or CHM U211.</i>	4 SH	GEO U544 Sedimentation Describes the physical processes of sedimentation and their role in the interpretation of sedimentary environments. <i>Coreq. GEO U545. Prereq. GEO U200 or permission of instructor.</i>	5 SH
GEO U530 Structural Geology Focuses on the description and origin of rock structures with emphasis on the interpretation of the mechanics of deformation. <i>Coreq. GEO U531. Prereq. GEO U200, GEO U201, and GEO U310.</i>	5 SH	GEO U545 Lab for GEO U544 Accompanies GEO U544. Concentrates on the interpretation and description of the physical properties of sediments and sedimentary environments. <i>Coreq. GEO U544.</i>	0 SH
GEO U531 Lab for GEO U530 Accompanies GEO U530. Emphasizes lab analyses of structural features and problems utilizing geologic maps, structural models, stereograms, petrographic microscope, rock specimens, and field exercises. <i>Coreq. GEO U530.</i>	0 SH	GEO U546 Coastal Processes Examines the effect of coastal marine processes and the resultant coastal responses. Topics include the dynamics of waves and currents and the associated erosion, transportation, and deposition of sediment-forming beaches, barrier islands, and cliffed shorelines. <i>Coreq. GEO U547. Prereq. GEO U200 and permission of instructor.</i>	5 SH
GEO U540 Sedimentary Basin Analysis Presents the analysis of sedimentary basins based on detailed study of sedimentary petrology, sedimentary structures, and stratigraphic sequences and fossils. <i>Coreq. GEO U541. Prereq. GEO U220 and GEO U221.</i>	5 SH	GEO U547 Lab for GEO U546 Accompanies GEO U546. Covers topics from the course through various experiments. <i>Coreq. GEO U546.</i>	0 SH
GEO U541 Lab for GEO U540 Accompanies GEO U540. Lab work uses geologic sections, suites of sedimentary rocks and thin sections, and drill cores and borehole logs to interpret and analyze the geologic history and environmental and economic potential of sedimentary basins. <i>Coreq. GEO U540.</i>	0 SH	GEO U548 Marine Geology Compares the balance between major sedimentary and tectonic forces in ocean basins and margins to the resulting ocean form. Topics include origin of continental margins, shelf sedimentation and transport, and deep-sea processes and sediments. Evaluates resource development of OCS oil, sand and gravel, and manganese nodules. <i>Prereq. GEO U200 and permission of instructor.</i>	4 SH
GEO U542 Fossils and Paleoecology Surveys major events, processes, and important invertebrate phyla preserved in the fossil record. This knowledge of paleontology is then utilized to evaluate evolutionary principles and the nature of function and adaptation in the history of life. Organization of populations into paleocommunities and their relationships to changes in environments through time permit the assessment and evaluation of paleoecology in earth history. <i>Coreq. GEO U543. Prereq. GEO U220 and GEO U221 or permission of instructor.</i>	5 SH	GEO U550 Geology and Land-Use Planning Studies the causes and solutions of geologic environmental problems related to land use. Emphasizes geologic-based land-use planning solutions to problems related to landslides, ground subsidence, coastal erosion, stream erosion and flooding, soil erosion, and groundwater pollution. <i>Prereq. GEO U200, GEO U201, and GEO U310.</i>	4 SH
		GEO U560 Geographic Information Systems Covers geographical information systems (GIS), a way to input, store, analyze, and display spatial data (data with a geographic location). Introduces the major components and applications of this exciting new tool. Consists of two lectures and one laboratory period a week. Laboratory exercises introduce students to methods of data analysis as well as practical issues of how to manipulate various GIS software packages. <i>Coreq. GEO U561. Prereq. GEO U200.</i>	5 SH
		GEO U561 Lab for GEO U560 Accompanies GEO U560. Covers topics from the course through various experiments. <i>Coreq. GEO U560.</i>	0 SH

GEO U562 GIS Workshop 2 SH
Studies the basic techniques of reflection and refraction seismology, gravity, aeromagnetic, and heat-flow processes, and the information they provide on the structure, composition, and dynamics of the earth's interior. *Prereq. Permission of instructor.*

GEO U563 Applied GIS 4 SH
Provides an introduction to the essentials of geographic information systems (GIS) for students who need a short, concise course to allow them to use the tools for their own research activities. *Prereq. Permission of instructor.*

GEO U570 Glacial and Quaternary History 5 SH
Covers the processes of ice movement and the characteristics and distribution of erosional and depositional structures associated with past and present glaciers; introduces Quaternary chronology. An individual research project augments class activities. *Coreq. GEO U571. Prereq. GEO U200.*

GEO U571 Lab for GEO U570 0 SH
Accompanies GEO U570. Covers topics from the course through various experiments. *Coreq. GEO U570.*

GEO U580 Groundwater Modeling 4 SH
Uses computers to solve problems in the flow of groundwater. Develops concepts of groundwater flow. Uses the finite difference method to model steady-state and transient flow. Programs are supplied by the instructor so programming skill is not a prerequisite. *Prereq. MTH U141 or equivalent.*

GEO U582 Groundwater Geochemistry 4 SH
Investigates important geological processes that occur when groundwater interacts with rock or soil, modifying groundwater chemistry and affecting water quality. Examines groundwater contamination and dispersion, isotope tracer studies, field sampling, and analytical methods. *Prereq. CHM U211 and CHM U212.*

GEO U585 Engineering Geology 4 SH
Offers the interdisciplinary study of how geology is applied to engineering projects. Examines the application of geologic thought and geophysical methods to the site selection and planning of human-constructed features such as foundations, landfills, highways, dams, tunnels, power plants, and mines. An individual research project augments class activities. *Prereq. GEO U200.*

GEO U600 Undergraduate Research 4 SH
Offers independent research on a selected topic under the direct supervision of a faculty member. Fulfills the college's experiential education requirement for geology majors. *Prereq. Permission of instructor and junior or senior standing.*

GEO U677, GEO U678, GEO U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

GEO U921 Directed Study 1 SH
GEO U922 Directed Study 2 SH
GEO U923 Directed Study 3 SH
GEO U924 Directed Study 4 SH

Offers independent study of a specific topic not normally contained in the regular course offerings, but within the area of competence of a faculty member. *Prereq. Permission of instructor.*

GEO U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

GEO U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. GEO U970 and honors program participation.*

GENERAL ENGINEERING TECHNOLOGY

SCHOOL OF ENGINEERING TECHNOLOGY

GET U100 College: An Introduction 1 SH
Presents strategies for success, in both the classroom and within the profession. Topics include personal and professional goal setting, study skills, diversity, ethics, and conduct.

GET U111 Engineering Technology Cooperative Education 1 SH
Introduces students to engineering technology by identifying types of opportunities in each of the technology disciplines. Topics include a discussion of cooperative work assignments and career opportunities available to graduates. Utilizes industry speakers and faculty.

GET U113 Career Management 1 SH
Addresses the needs of students and the issues they face when they reach the "moving on" stage of the undergraduate education experience. Focuses on defining the ways in which the student has grown and become more knowledgeable through the course of his/her undergraduate activities and examines the student's decision making during this period. The goal is the final development of career management skills to improve the likelihood of greater satisfaction. *Prereq. GET U111.*

GET U121 Computer Applications for Technology 4 SH
Provides extensive experience with mainstream computer applications including word processing, spreadsheet, presentation, Internet, and operating system software. Covers advanced features and configurations details of the most popular applications software with project-based assignments. *Coreq. GET U122.*

GET U122 Lab for GET U121 Accompanies GET U121. Covers topics from the course through various experiments. <i>Coreq. GET U121.</i>	0 SH	Includes examples of the preparation and use of effective marketing data; patent and literature search for prior art; customer and engineering specifications; brainstorming techniques to generate feasible solutions to the problem; and the process for selecting the most viable solution. Provides examples of generating labor and materials budgets for product/project development and the presentation of these results in an effective oral and written communication. <i>Coreq. GET U682. Prereq. Senior standing.</i>
GET U131 Engineering Graphics 1 Introduces students to the engineering design process. Explores two-dimensional computer drawing and freehand/instrument sketching. Topics include orthographic, isometric, oblique, perspective drawing, and associated sections and developments. These drawing methods are used to produce architectural, mechanical, and electrical/electronics-based engineering drawings. <i>Coreq. GET U132.</i>	4 SH	
GET U132 Lab for GET U131 Accompanies GET U131. Covers topics from the course through various experiments. <i>Coreq. GET U131.</i>	0 SH	GET U682 Lab for GET U681 Accompanies GET U681. Covers topics from the course through various experiments. <i>Coreq. GET U681. Prereq. Senior standing.</i>
GET U277, GET U278, GET U279 Honors Adjunct Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each	GET U683 Capstone Design Project Implements the project specifications and design developed in GET U681. Students from the CET, EET, and MET disciplines come together to work effectively as a team. Students apply knowledge from a variety of domains to formulate a plan resulting in the complete solution to design and system problems. Culminates in the creation of a working prototype along with a final report and oral presentation by team members. Individual capstone projects are optional with the approval of the CET, EET, and MET program coordinators. <i>Coreq. GET U684. Prereq. GET U681.</i>
GET U331 Engineering Graphics 2 Continues GET U131. Focuses on the development of engineering design utilizing two- and three-dimensional computer drawings. Topics include manufacturing and building processes utilizing mechanical and structural drawings. Specialized topics include pipe and ventilation drawings. Requires a conceptual and detailed design project. <i>Coreq. GET U332. Prereq. GET U131.</i>	4 SH	GET U684 Lab for GET U683 Accompanies GET U683. Covers topics from the course through various experiments. <i>Coreq. GET U683.</i>
GET U332 Lab for GET U331 Accompanies GET U331. Covers topics from the course through various experiments. <i>Coreq. GET U331.</i>	0 SH	GET U921 Directed Study GET U922 Directed Study GET U923 Directed Study GET U924 Directed Study Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i>
GET U477, GET U478, GET U479 Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each	GET U970 Junior/Senior Project 1 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i>
GET U677, GET U678, GET U679 Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each	GET U971 Junior/Senior Project 2 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. GET U970 and honors program participation.</i>
GET U681 Capstone Preparation Introduces the design process methodology used by engineers in successful companies to formulate a solution to a product or project design problem. The design process from problem statement to prototype fabrication and testing is reviewed.	2 SH	

HONORS

HNR U300 Topics in Research and Inquiry: 4 SH
A Diversity Perspective

Focuses on research and scholarly inquiry in the area of diversity as it relates to race, social class, ethnicity, gender, age, sexual orientation, religion, or disability. Topics may include non-Western as well as Western examples of diversity. *Prereq. Honors program participation and sophomore standing or above.*

HNR U301 Topics in Research and Inquiry: 4 SH
An Historical, Ethical, or Aesthetic Perspective

Examines an historical, ethical, or aesthetic perspective in conducting research and scholarly inquiry. *Prereq. Honors program participation and sophomore standing or above.*

HNR U302 Topics in Research and Inquiry: Focus on Analysis 4 SH
Explores different analytical perspectives in conducting research and scholarly inquiry. *Prereq. Honors program participation and sophomore standing or above.*

HNR U303 Topics in Research and Inquiry 4 SH
Studies the range of issues and challenges in conducting research and scholarly inquiry. Topics may include basic or applied research. *Prereq. Honors program participation and sophomore standing or above.*

HNR U320 Topics in Urban Experience: 4 SH
A Diversity Perspective

Examines the nature of diversity in an urban environment. Diversity is studied as it relates to race, social class, ethnicity, gender, age, sexual orientation, religion, or disability. Topics may include non-Western as well as Western examples of diversity. *Prereq. Honors program participation and sophomore standing or above.*

HNR U321 Topics in Urban Experience: 4 SH
An Historical, Ethical, or Aesthetic Perspective

Explores historical, ethical, or aesthetic aspects of the urban experience. *Prereq. Honors program participation and sophomore standing or above.*

HNR U322 Topics in Urban Experience: Focus on Analysis 4 SH
Covers analytical perspectives that are useful in understanding the urban experience. *Prereq. Honors program participation and sophomore standing or above.*

HNR U323 Topics in Urban Experience 4 SH
Emphasizes important aspects of the urban setting. Topics may include the broad range of human and physical dimensions of the urban experience. *Prereq. Honors program participation and sophomore standing or above.*

HNR U340 Topics in Contemporary Issues: 4 SH
A Diversity Perspective

Focuses on important contemporary issues that highlight the diversity in our society as defined by differences in race, social class, ethnicity, gender, age, sexual orientation, religion, or disability. Topics may include non-Western as well as Western examples of diversity. *Prereq. Honors program participation and sophomore standing or above.*

HNR U341 Topics in Contemporary Issues: 4 SH
An Historical, Ethical, or Aesthetic Perspective

Examines important contemporary issues from an historical, ethical, or aesthetic perspective. *Prereq. Honors program participation and sophomore standing or above.*

HNR U342 Topics in Contemporary Issues: Focus on Analysis 4 SH
Studies important contemporary issues from one or more analytical perspectives. *Prereq. Honors program participation and sophomore standing or above.*

HNR U343 Topics in Contemporary Issues 4 SH

Explores a range of important contemporary issues facing society. *Prereq. Honors program participation and sophomore standing or above.*

HUMAN RESOURCES MANAGEMENT

COLLEGE OF BUSINESS ADMINISTRATION

HRM U201 Organizational Behavior 4 SH

Provides an overview of the actions and behaviors of people in organizations. Uses case studies, videos, experiential exercises, lectures, and discussions to explore the effects of individual, interpersonal, group, organizational, and cross-cultural factors on human behavior. Topics include groups and teams, motivation, leadership, organizational change, organizational culture, structure, conflict resolution, and communication. Both the underlying theories and principles of these topics, as well as their practical applications and implications for organizations, are covered. *Prereq. Sophomore standing or above.*

HRM U277, HRM U278, HRM U279 1 SH each
Honors Adjunct

Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

HRM U301 Introduction to Human Resources Management 4 SH

Helps students understand the key areas of human resource management (HRM), comprising organizational policies and practices and such external factors as government legislation, unions, demographics, competition, and others that influence those practices and policies. Presents students with a general manager's perspective on HRM that considers human resource management to be the responsibility of all managers, as well

as of the organization's HRM functional area. Topics include strategic HRM, employment laws and employee rights, recruitment, selection, training, development, performance measurement, rewards and compensation, benefits, employee communication, HR information systems, employee and labor relations, unions and collective bargaining, and international HRM. Discusses contemporary HRM issues including workforce diversity, organizational restructuring, globalization, executive compensation, affirmative action, and technology.

Prereq. HRM U201.

HRM U401 Building Your Management Skills 4 SH
Focuses on skills important to managers. Students conduct self-assessments, receive feedback, and develop other management skills. Among them are becoming a better team member, presenting, writing, motivating, negotiating, and giving and receiving feedback. Emphasizes self-assessment, experiential exercises, and ongoing practice to develop skills. *Prereq. HRM U201.*

HRM U477, HRM U478, HRM U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

HRM U501 Competitive HRM Practices 4 SH
Focuses on the strategic role of human resource management; that is, HRM's contribution to the business strategy. How do HRM principles, policies, and practices increase the competitiveness of organizations? Topics include designing reward systems to foster the behavior you need, building teams that produce great results, helping individuals and organizations learn, building competitive cultures, and understanding the role of HRM in successful organizational change. *Prereq. HRM U301.*

HRM U600 Management of Innovation 4 SH
Explores what the manager can do to foster innovation (the process of turning ideas into useful outputs) as well as control and direct it best to accomplish the company's goals. Discusses the process of innovation, the role of the manager, and the selection of organization designs and systems as key components of innovation. *Prereq. Honors program participation.*

HRM U677, HRM U678, HRM U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

HRM U921 Directed Study 1 SH
HRM U922 Directed Study 2 SH
HRM U923 Directed Study 3 SH
HRM U924 Directed Study 4 SH

Allows students who have received approval to undertake independent study in lieu of any course required in the various concentrations. Students present proposals to an Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study takes place. A copy of the final report prepared by the student is presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from concentration coordinators.

Prereq. Permission of instructor.

HRM U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

HRM U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. HRM U970 and honors program participation.*

HUMAN SERVICES

COLLEGE OF ARTS AND SCIENCES

HS U100 College: An Introduction 1 SH
Intended for first-year students in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

HS U101 Human Services Professions 4 SH
Explores the attitudes, values, skills, and knowledge of the human services worker and the reasons why people in modern society require human services assistance. Views the human services agency from the eyes of clients as well as society as a whole. Introduces the range of skills used in working with clients in a variety of helping roles such as counseling and interviewing, advocacy, and group work. Required for HS majors as a prerequisite to more specialized courses.

HS U277, HS U278, HS U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

<p>HS U300 Counseling in Human Services 4 SH Presents an overview of the major theoretical approaches to counseling and therapeutic interventions. Focuses on developing clinical skills and competency in intentional interviewing. Combines systemic group exercises and experiential activities to practice interviewing techniques. Cross-cultural issues in counseling are integrated throughout the course. <i>Prereq. HS U101, SOC U101, and PSY U101.</i></p>	<p>HS U700 Senior Seminar in Human Services 4 SH Examines emerging roles and career options within the human services field. Focuses on self-examination of attitudes and values affecting delivery of services, exploration of ethical issues and dilemmas relevant to human services, grant and funding issues, staff supervision and development within human services agencies, and refinement of group leadership skills. <i>Prereq. Senior standing in HS.</i></p>
<p>HS U477, HS U478, HS U479 1 SH each Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>	<p>HS U900 Special Topics in HS 4 SH Reviews and discusses selected human services topics. <i>Prereq. Junior or senior standing in HS or approval of instructor.</i></p>
<p>HS U520 Child Intervention and Treatment 4 SH Explores current issues facing children and families across a variety of settings (school, foster care, residential treatment, and court systems). Focuses on child-centered intervention and treatment strategies and also examines the importance of multidisciplinary policy. Meets HS elective requirement. <i>Prereq. Junior or senior standing in HS.</i></p>	<p>HS U901 Co-op Integration Seminar 1 SH Offers students the opportunity on co-op to engage in (through in-class and online meetings) discussions and inquiry about topics relevant to being a human services professional in today's turbulent world of work. Topics vary each semester and may include ethics, diversity, and organizational change. <i>Prereq. Completion of one or more co-op placement.</i></p>
<p>HS U540 Services and Treatments for Chemical Dependencies 4 SH Explores students' personal and cultural perspectives about substance use, abuse, and addiction, through the use of readings, films, and case studies. Students evaluate the causes of chemical dependence, and methods of recognition, intervention, and treatment. Offers students the opportunity to investigate the effects of chemical dependency on the family. Meets HS elective requirement. <i>Prereq. Junior or senior standing in HS.</i></p>	<p>HS U921 Directed Study 1 SH HS U922 Directed Study 2 SH HS U923 Directed Study 3 SH HS U924 Directed Study 4 SH Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i></p>
<p>HS U560 Society, Identity, and Religion 4 SH Explores the links among and between society, identity, and religion from the perspective of community service and social justice. In conjunction with the Jewish Studies Program, themes from Judaism are used throughout the course in order to understand the ways in which religious/ethnic identity helps to shape the lives of real people. Explores religious social services in the United States from a historical basis. Examines the politics of doing good and its effect on community service, professional ethics, personal identity, and moral beliefs as part of the larger American collective consciousness. Also uses contemporary American Jewish social services as the major lens through which we explore critical service-related issues. <i>Prereq. Junior or senior standing in HS.</i></p>	<p>HS U940 Human Services Internship 6 SH Requires students to fulfill one internship placement during the last two years of the program. Consists of required field site hours and varies according to the students' interests. Examples of placement sites include community centers, nursing homes, vocational workshops, state and federal agencies for children, and recreational facilities. Experiences are supervised by internship supervisor to maximize the student's learning opportunities. Fulfills the Arts and Sciences experiential education requirement. <i>Prereq. Junior or senior standing and approval of instructor.</i></p>
<p>HS U677, HS U678, HS U679 1 SH each Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>	<p>HS U970 Junior/Senior Project 1 4 SH Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i></p>
	<p>HS U971 Junior/Senior Project 2 4 SH Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. HS U970 and honors program participation.</i></p>

HISTORY

COLLEGE OF ARTS AND SCIENCES

- HST U100 College: An Introduction** 1 SH
Intended for freshmen in the College of Arts and Sciences. Seeks to introduce freshmen to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.
- HST U103 Women's Studies** 4 SH
Introduces the issues and methodology involved in the interdisciplinary study of women. Encompasses the historical, political, economic, and social processes that have created both the image and the reality of women in society. Uses guest lecturers to provide an overview of the many disciplinary approaches to the study of women. Required for women's studies minors and can be used as a general elective or, depending on the discipline of the coordinator, to satisfy special concentration requirements.
- HST U110 Introduction to World History** 4 SH
Emphasizes large-scale patterns, long-term changes, and interconnections of world history. Provides a different way of looking at the past than national histories, one that is appropriate for the increasing globalization and multiculturalism of today's world. The course may begin as early as the first settled towns or written documents, the appearance of the first humanoid species, or even the beginning of the universe. Examines the great continuities and changes that have brought us to where we are today. Links between global processes and individual experiences are explored through primary documents, autobiographies, and stories.
- HST U115 World History Education** 1 SH
Designed for students in the education program currently enrolled in HST U110. In this one-credit attachment, students are required to keep a journal and to develop curriculum sets for world history secondary education based on materials used in the course.
- HST U120 Introduction to Public History** 4 SH
Examines the philosophical, ethical, and practical aspects of applying the historian's craft and training to work outside the classroom. Covers the history and practice of historic preservation; archives management; history museums; cultural resources management; the practice of history in businesses and corporations; historical archaeology; historic house museums; historical pageantry and reenactment; editing of personal and governmental papers and correspondence; public history and the politics of public memory and history; documentary filmmaking and history; historical fiction and fictional historical films; history in and of government; and industrial archaeology. Investigates issues such as conflict of interest in collections management and publishing, the repatriation of looted or captured artifacts, and the rights and responsibilities of the creators and consumers of historical fiction.
- HST U130 Introduction to American History** 4 SH
Introduces students to major topics in American history using some combination of primary documents, biographies, monographs, and film. Topics include the interaction of native populations with European settlers; the American Revolution and the Constitution; slavery; the Civil War; the rise of industrialism and immigration; the growth of government and rise of the welfare state; race, gender, and class in America; and America's role in the world from the emergence of imperialism to collective security.
- HST U140 Introduction to African-American History** 4 SH
Surveys the development of African Americans in the United States from their African background to the present. Covers medieval and early modern societies in West and Central Africa; the transatlantic slave trade; the evolution of slavery from the colonial period through the Civil War; free blacks; Reconstruction; migration; civil rights; and black nationalism. Considers gender relations throughout the entire period and emphasizes how a historical perspective helps to inform discussions of contemporary issues.
- HST U150 East Asian Studies** 4 SH
Provides an understanding of the constituent characteristics that originally linked East Asia as a region and the nature of the transformations that have occurred in the region over the last two thousand years, concentrating on China and Japan, and addressing Korea and Vietnam where possible. Provides students with effective interdisciplinary analytical skills as well as historical, ethical, cultural diversity, and aesthetic perspectives.
- HST U170 Introduction to European History** 4 SH
Examines major themes in the history of Europe from 1500 to the present, emphasizing the conceptual tools historians use to think about European history, and drawing on historical documents, literature, and film. Examines the emergence of states and nations as theoretical constructs and political realities; men's and women's experience of social conflict—rebellions, revolutions, and wars—and the complex relationships between Europeans and non-Europeans. Attention is given to how race, class, and gender shaped the way people made and understood their history.
- HST U180 African History** 4 SH
Explores the history of the African continent from 1000 ad to the present era. Topics include medieval kingdoms (Ghana, Mali, Songhai, Zimbabwe, the city-states of East Africa, and the Kongo kingdom); slave trades (Indian Ocean, trans-Saharan, and transatlantic); the partition of Africa and European colonization; and the decolonization process. Emphasizes the interactions of African peoples with the rest of the world, particularly the relations between Africa and Europe after 1500 ad.

- HST U201 The History Colloquium 4 SH
Provides an introduction to historical methods, research, writing, and argument where all students produce a substantial research project that passes through at least two revisions, and that is presented publicly to other members of the colloquium. *Prereq. History majors only.*
- HST U202 Global Inequity 4 SH
Evaluates different historical, economic, and cultural explanations of global socioeconomic inequality in the modern world. Examines why some parts of the world are much richer than others; why people so often divide the world as “the West and the rest,” or the First, Second, and Third Worlds; if these divisions have any reality; and how the social and economic status of individual nations are shaped by patterns and relationships that are global in scale. Also explores the ways in which peoples on different sides of this economic divide understand and depict themselves and one another, through cultural production, political thought, and social movements.
- HST U203 Modern Family 4 SH
Examines the family as theoretical construct and as social reality from approximately 1600 to the present, in Europe and America. Attempts to understand the social meanings of “the family” by looking at the different forms it has taken in different locations at different times; the historical significance of kinship and household; and at the ways in which “the family” has been constituted by different ideological and political systems. Uses film, literature, and primary documentary sources to examine practices of marriage and sexuality; the family in relation to capitalism, socialism, and the state; the development of welfare state policy; racial and ethnic differences in family practices; and the dynamics of gender within families.
- HST U204 Third World Women 4 SH
Explores the complex gender dynamics of women in non-Western societies during the years of Western imperialist domination, nationalist resistance struggles, and postcolonialism. Begins by deconstructing the term “Third World” and seeing how that term can be read against the context of imperialism. Examines gender constructs in the Third World through a variety of written and visual materials including autobiographical accounts, ethnographies, historical fiction, films, and slides. Topics include patterns of gender domination and female resistance; the interplay of race and gender hierarchies under colonial rule; the Western gaze and representations of Third World “primitive” women; and the feminization of labor and the global economy, reproductive strategies, and sex trafficking.
- HST U210 Atlantic Connection 4 SH
Focuses on the major themes of Atlantic history and especially on the interconnections of the Atlantic world, circa 1000–1840. During this period, ships, goods, diseases, human beings, and ideas flowed across the ocean, tying together the Atlantic basin in a complex web of relationships. Examines Atlantic history more deeply than merely through a chronological narrative, exploring central cultural themes such as gender, social developments, the economy, and ideologies. Considers explorations; colonization and conquest; and the movement of people and ideas.
- HST U211 World History since 1945 4 SH
Examines the political, economic, social, and cultural relationship between the developed and developing world since the end of World War II. Topics include the Cold War, independence and national movements in developing countries, the globalization of the world economy, scientific and technological innovations, wealth and poverty, the eradication of some diseases and the spread of others, the fall of the Soviet Union, Middle East turmoil, and the enduring conflict between Israel and Palestine.
- HST U212 History of Race 4 SH
Explores the creation, modification, and clash of racial identities in the modern world. Shows the worldwide patterns of racial discrimination and reform in the past three centuries, and how they are changing today. Discusses development of racial categories and ideas and practices in racial mixing. Explores racial desegregation and persecution, and campaigns against racial discrimination. Includes background on human evolution and debates on the origins and meaning of physical differences among humans.
- HST U213 History of Violence 4 SH
Traces the global history of violence since the late Middle Ages. Topics include the Inquisition, the European witch craze, revolution, pornography, violent crime and punishment, media violence, lynch law, racism, genocide, war, torture, gender violence, and terrorism. Explores the modern emergence of a popular culture of violence, approaching themes from the perspectives of perpetrators, victims, and bystanders alike.
- HST U214 War in the Modern World 4 SH
Provides an analysis of the political and economic revolutions that produced modern industrial warfare, and explores the causes, prosecutions, and effects of the major wars fought since the mid-nineteenth century. Large portions of the course focus on World Wars I and II, but attention is also paid to the smaller wars of this period, to unconventional and nonmilitary forms of warfare, to the international trade in arms and training, and to terrorism, both state-sponsored and transnational. Using films, simulations, and team projects, students explore the diplomatic, political, economic, social, cultural, and psychological impacts of these wars as well as their military and technological aspects.
- HST U215 Contemporary Controversies 4 SH
Helps students develop an understanding of the historical contexts of contemporary controversies. Topics change from year to year, but generally students work through casebooks of concentrated readings in selected primary and secondary sources on targeted issues: racism, violence, crime, the abortion debate, and so on. Also designed for students in the education program. Addresses major issues in history, the humanities, and the social sciences. Using the curriculum and materials developed by Educators for Social Responsibility, the course addresses controversial issues in the past and present, and introduces students to the dilemmas and techniques for effective teaching of difficult issues.

<p>HST U221 Flight and Space Travel 4 SH Traces the history of nonpowered flight, beginning with the dreams of flight of the ancient Chinese and the Greeks, through Leonardo da Vinci; from the balloon experiments of the Montgolfier brothers to contemporary hang gliders; powered flight from the Wright brothers to the SST; and rocketry and space travel from its earliest beginnings to the International Space Station and beyond.</p>	<p>HST U234 United States since 1877 4 SH Examines patterns of social, cultural, economic, political, and diplomatic history of the United States from 1877 to the present.</p>
<p>HST U222 History of Science and Technology 4 SH Offers a global interdisciplinary survey of the separate developments of science and technology, and the complex relationships between them, integrating theories of the philosophy and sociology of science within a historical framework. Emphasizes the environmental and ideological conditions that contribute to the birth and growth of the various sciences and to the relation between these conditions and technological innovation.</p>	<p>HST U235 American Historians 4 SH Explores the development of American historical writing from the seventeenth century to the present, with attention to changes in the nature of historians, the rise of professionalization, the development of cooperative history, conflict and consensus approaches, and the current emphasis on race, class, and gender.</p>
<p>HST U223 History of the Automobile 4 SH Focuses on the impact of the automobile on modern and contemporary society in its historical context. Topics include the abandonment of traditional prohibitions of motorized carriages; the use of planning, taxes, and highway policies to foster the use of the automobile; the effects of the car on land use, recreation, and the economy; contemporary issues such as pollution and energy; and the “car culture.”</p>	<p>HST U240 History of Sport in America 4 SH Provides a history of the major sports and their impact on American life.</p>
<p>HST U230 Contemporary America 4 SH Covers the emergence of the politics of dissent; thawing of the Cold War; military adventures in Asia, the Middle East, and the Balkans; decline of the presidency; growth of electronic media; and changes in race, gender, and class.</p>	<p>HST U241 History of Media in America 4 SH Focuses on mass communications in American history, with attention to the roles of books, newspapers, magazines, films, radio, and television.</p>
<p>HST U231 History of the American Home 4 SH Examines the material culture of Americans’ homes from the settlement of the Massachusetts Bay Colony in 1630 to the present. Foodways, gender roles and distinctions, rituals, and the history of the American family are uncovered in the artifacts and architecture of ordinary Americans. Offers the opportunity for students to see—rather than merely look at—their own material surroundings. Uses slides and other visual materials extensively. Offers analysis from several disciplines (social history, archaeology, art history, and architectural history), and how these disciplines can be integrated in the study of American society and customs. The primary evidence used in this course is material: housing, the landscape, and the artifacts of everyday life of Americans of all classes.</p>	<p>HST U242 Women in America 4 SH Examines gender relations in America from the colonial period to the present, with attention to how race, class, ethnicity, and sexuality shaped gender and particularly the experience of women. Looks at how contemporary issues such as pay inequity, the gender gap in political participation, sexual harassment, intersecting gender and racial inequalities, the glass ceiling, and debates over reproductive rights all have profound historical roots. Uses documentary sources, literature, film, and other visual materials to examine topics such as the encounters of Native American women with white settlers, African-American women’s experience of slavery, women’s participation in revolution and war, the experience of industrialization, women’s struggles for civil and political rights, women’s private lives, and sexuality.</p>
<p>HST U232 History of Boston 4 SH Explores the history of Boston from colonial times to the present, with attention to the topographical growth and the ethnic composition of the city. Includes visits to historical sites and museums in the area.</p>	<p>HST U243 American Images of China 4 SH Examines the relationship between Sino-American international relations and changes in American popular perceptions of China as revealed in the media and literature. Focuses on Sino-American relations since the nineteenth century, including the period of the missionaries and opium traders; the era of special privileges; the Open Door policy; the first half of the twentieth century, when China became America’s favorite protégé; and the years of strain, warfare, and finally accommodation after the Chinese communists came to power in 1949.</p>
<p>HST U233 United States to 1877 4 SH Examines patterns of social, cultural, economic, political, and diplomatic history of the United States to 1877.</p>	<p>HST U250 Emergence of East Asia 4 SH Examines the origins of civilization in China, Japan, Korea, and Vietnam and the gradual cultural, economic, technological, political, and social developments that occurred from 2000 BC until 1850 AD. Emphasis is on notions of kinship, religious beliefs, concepts of the relationship of the individual to nature, kinship systems, urbanization, patterns of education, intellectual trends, and the rise of commerce.</p>

- HST U251 Modern East Asia 4 SH
Traces the development of the region from the mid-nineteenth century until the end of the twentieth century. Emphasis is on the impact of the West, the roots of nationalism, industrialization, the causes and effects of the Japanese colonial empire on the region, the American occupation of Japan, the rise of the People's Republic of China, and wars in Korea and Vietnam. Also devoted to contemporary issues in the region.
- HST U252 Japanese Literature and Culture 4 SH
Explores major works of Japanese fiction and poetry in historical and cultural context. All readings are in English translation.
- HST U253 History of Vietnam Wars 4 SH
Presents a history of military conflicts on the Indochinese peninsula from its precolonial settlement, internal developments and divisions, its stormy relationship with China, French colonization and the resistance to it, the rise of the Viet Minh during World War II, the postwar struggle against the French, the impact of the Cold War, and the involvement of the United States after 1950 in the creation of two Vietnams and in the conflict that engulfed it and its neighbors, Laos and Cambodia, in the decades that followed. Emphasizes the roles of nationalism and communism in the twentieth-century conflicts and the motives for American intervention. Films revealing the reactions of Americans to the escalating conflict are shown and evaluated.
- HST U260 Modern Latin America 4 SH
Traces the developments in this region since independence and the inception of nationhood. Topics include state formation and society in the nineteenth century; economic development and underdevelopment in the region; race, class, and ideology; United States/Latin American relations; populism; the roots of revolution and authoritarianism; and the contemporary experiments with neoliberal policies.
- HST U261 The Modern Caribbean 4 SH
Focuses on the social, economic, and cultural forces that have shaped the character of the Caribbean people. Examines the variety of societies, cultures, and institutions of the region in their historical and contemporary settings, beginning with pre-Colombian cultures, moving through the colonial period, plantation agriculture, slavery, the expansion of U.S. influence, urbanization, economic development models, authoritarian politics, and the contemporary migration of Caribbean people to the United States and Europe.
- HST U270 Ancient Greece 4 SH
Studies the Greek achievement from proto-Indo-European migrations through the Minoan and Mycenaean bronze age, to the evolution of Homeric and Hellenic societies in the iron age, to the rise of the city-states and the age of Alexander. Topics include the coexistence of the rational and the irrational; the paradox of ethical philosophies and exclusionary political systems; the tensions between particularism and cultural unity; and gender ideology and what has been termed "the reign of the phallus."
- HST U271 Ancient Rome 4 SH
Studies the establishment and origins of civilization in the Italian peninsula from Etruscan, Latin, and Greek foundations through the rise and institutionalization of the republic, to the achievement of empire, to Rome's interactions with diverse peoples and its decline and collapse. Themes include diversity, toleration, uses and dangers of power, Rome's legalistic legacy, and the Latinization of Christianity.
- HST U272 The Invention of Europe 4 SH
Examines the history of Europe in a period of tremendous fluidity, migration, and flux. Looks at the experiences of men and women in European societies before clearly defined nation-states had emerged. Topics include forms of political and cultural integration, the contacts between Europeans and non-Europeans in the Mediterranean and beyond, and the place of religion, art, and ideology, with attention to how Europeans' experiences varied according to their gender, class, and race.
- HST U273 Belief in Magic and Science in Europe 4 SH
Explores some of the main ways of ordering ideas in sixteenth- and seventeenth-century Europe. The cosmos of early modern people was very different from the modern Western worldview. Religion, magic, and science were not competing and clearly delineated systems. Instead, they were often practiced simultaneously. Studies how early modern people understood their world, and the ways in which the modern distinctions between these belief systems arose. Topics include social domination, changes in religious structures, witchcraft, the roles of women, and the development of modernity.
- HST U277, HST U278, HST U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- HST U280 Hitler's Germany 4 SH
Studies historical developments from Germany's defeat in World War I to the end of World War II. Topics include the failure of Weimar democracy; Weimar culture; the rise to power of Hitler and National Socialism; Nazi culture and racial wars against alleged "degenerates"; and the roles of party leaders, business and cultural elites, and ordinary Germans in supporting and legitimizing the Nazi dictatorship.
- HST U281 Holocaust 4 SH
Surveys the lives and circumstances of European Jewry prior to the Nazi seizure of power. Examines the ideological foundations of the Holocaust, and studies the Jewish experience in the context of Nazi genocides against other targeted groups. Probes the initiation, practice, and direction of the Nazi (German) persecution of Jews, culminating in the ghettos, slave labor factories, and death camps of the Final Solution. Confronts the roles of victims, perpetrators, and bystanders.

- HST U285 Russian Civilization 4 SH
Examines the origins of Russian culture in Eastern Orthodoxy and relations with the Byzantine Empire, and the subsequent evolution of Kiev, Moscow, and St. Petersburg as cultural/political centers, up to the 1917 Bolshevik Revolution. Includes readings in medieval Russian literature and nineteenth-century fiction, with consideration of the development of music and the visual arts. Conducted in English.
- HST U286 History of the Soviet Union 4 SH
Surveys social, political, economic, demographic, and cultural developments in the former Soviet Union since 1917: the legacies of war and revolution; the civil war between the communists and the anti-communists; famine; the New Economic Policy; competing perspectives on the new regime; the rise of Stalin; the Cultural Revolution; collectivization and industrialization; the Purges; World War II and its impact; the “two camps” and the origins of the Cold War; the Soviet Union and the new East European system; Khrushchev; de-Stalinization; intellectuals and the “thaw”; the Cuban missile crisis; the demise of Khrushchev; Brezhnev and the period of stagnation; the Gorbachev Revolution; Yeltsin; nationalism; and the dissolution.
- HST U290 Modern Middle East 4 SH
Studies Middle Eastern politics, culture, and society from the mid-nineteenth century to the present.
- HST U301 The History Seminar 4 SH
Introduces history majors to advanced techniques in historical research and writing. Seminar themes vary; please check with the department for a list of each year’s seminar offerings. *Coreq. HST U302. Prereq. HST U201 and three additional history courses; sophomore standing or above.*
- HST U302 Historical Writing 1 SH
Covers learning and practicing methods and conventions of historical writing for publication. Adjuncted to a Seminar in History, which fulfills the Advanced Writing in the Disciplines requirement. *Coreq. HST U301. Prereq. HST U201 and three additional history courses; sophomore standing or above.*
- HST U310 Spread of Buddhism 4 SH
Focuses on Buddhism both as a set of spiritual ideas and as a living practice. From its origins in northern India more than 2,500 years ago to its current status as the fastest-growing religion in North America, Buddhism has had a lasting influence over much of world history. Examines the historical context in which Buddhism first developed, and how it adapted to different social and political situations throughout the world. Also engages in “practice-oriented” activities with contemporary Boston-area Buddhism in order to understand Buddhism’s continued relevance in today’s world. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U311 Colonialism/Imperialism 4 SH
Examines the military, economic, political, and cultural expansion of world powers since the fifteenth century, and the ways in which colonized peoples were ruled. Why did colonialist countries feel the need to conquer and dominate, how did they do it, and why did they retreat on some fronts? How did people resist and cooperate with colonialism? How did colonialism affect national and cultural identities? Colonialism is examined as a global phenomenon and from a comparative perspective that looks at particular case studies. Also examines decolonization in the twentieth century. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U312 Global Migration and the Modern World 4 SH
Studies the global historical context that has produced the great surge of migration in the modern world. We live in a world constantly in flux. People move around the world, carrying things, customs, and ideas, and interacting with others. Immigrants integrate into new homelands, while diasporas retain links and identities across great spans of distance and time. Hybrid and Creole peoples emerge, while other people maintain long-standing roots and identities. Examines the effects of migration upon families, culture, and national and personal identities through readings of primary documents, autobiographies, and secondary works. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U313 Gender and Revolution in Russia and China 4 SH
Surveys the complex interrelationships between socialist ideology, gender, and ethnicity in Russia and China during the twentieth century in this comparative study of women and gender in two socialist societies. Examines the ways in which communist revolutionaries confronted national traditions of subordination in their efforts to transform women’s conditions in Russia and China. Although vast differences exist between the two countries, there are several important points of comparison that provide critical material: deep-seated patriarchal traditions, socialist revolutions in which women’s equality was pushed to the forefront against “backward” national traditions, and modern postrevolutionary backlashes against women’s rights in both countries. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U314 From Europe to Globalization 4 SH
Examines social, cultural, and political developments using film, novels, and primary documentary sources in twentieth-century Europe from 1914 to the present. Explores Europe’s shift from domination through the implosion of Europe in the Great Depression and World War II, decolonization, the student movements of 1968, the reconstruction of Europe in the postcolonial world, and the place of Europe in the global system. Topics include men’s and women’s reactions to immigration and racism, the rise of welfare states, and the Cold War. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

- HST U315 Approaches to World History 4 SH
Focuses on interpreting major patterns and connections in world history through discussion and assignments. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U316 Teaching World History 1 SH
Designed for students in the education program currently enrolled in HST U315. This one-credit adjunct is primarily for preservice teachers of history. Students survey the world history of both early and recent times using major textbooks, readers, monographs, and electronic resources for world history. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U320 Wealth and Poverty 4 SH
Traces the history of industrialization and analyzes the impact of economic growth on individual standards of living in the affluent and lesser developed nations of the world between 1815 and the present. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U321 Technological Transformations 4 SH
Examines the relationship between technological innovations and the world in which they take place through a series of discrete case studies reaching across national boundaries and through the entire scope of human history. Discusses conditions necessary for discovery and innovation and the impact of technology on political, economic, and social environments. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U322 Work and Leisure 4 SH
Explores the historical development of contemporary patterns of work and leisure from early industrial societies to the present in Western Europe and America. Begins by examining contemporary dilemmas such as the balancing of work and leisure; issues such as wage equity; and the impact of new technologies on workers. Looks at the historical background of these dilemmas. Examines the transformation of work under industrial capitalism and the new forms of leisure that accompanied it; forms of resistance to work; gender and race differences in work; the rationalization of work and leisure in the twentieth century; and the meanings of "globalization" for workers today. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U330 Colonial and Revolutionary America 4 SH
Covers the discovery and exploration of the New World, the settlement of the English, French, Dutch, Swedish, Spanish, and Russian colonies on the North American mainland, their development to 1763, the origins of their clashes with England, and the American Revolution. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U331 The Civil War and Reconstruction 4 SH
Examines the causes and conduct of the U.S. Civil War, and the nature and effects of Reconstruction in the South. Topics include abolitionism and other reform efforts in the four decades before the war; constitutional and other political issues in the sectional crisis; territorial expansion as a sectional issue; the nature and economics of slavery and early capitalist formation in the North and South; the centrality of Abraham Lincoln in national politics; the military conduct of the war; technological innovation and its impact on the war; Reconstruction and the rights and plight of freed men and women; the rise of the Ku Klux Klan and other terrorist organizations; and the power of the Civil War, Reconstruction, and the ideals of equal rights in national memory. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U332 The Rise of Modern America 4 SH
Examines the social, cultural, intellectual, economic, political, and diplomatic history of the United States, 1877–1920. Emphasizes industrialization, the rise of the working and middle classes, the nature of progressive reform, participation in World War I, and global comparisons and influences on American life. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U333 U.S. Prosperity, Depression, War 4 SH
Examines the history of the United States between 1919 and 1961, focusing on "modern" life in the 1920s, the impact of the Great Depression, participation in World War II, the nature and impact of the Cold War, and the social and political implications of economic prosperity after 1945. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U335 American Constitution 1: 1783–1865 4 SH
Focuses on the history of American constitutionalism from independence to the Civil War, with attention to the decisions of the Marshall and Taney Courts and their relationship to the nation's political, economic, and social history. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U336 American Constitution 2: 1865–Present 4 SH
Provides an examination of the development of the American Constitution through amendments and judicial decisions by Supreme Courts from Chase to Rehnquist. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U337 African-American History before 1900 4 SH
Covers the development of black America from slavery through the Booker T. Washington–W. E. B. DuBois controversy, with emphasis on the historical links between Africa and America that have shaped the African-American experience. Includes in-depth discussion of slavery's impact, the role of the antebellum free black, the Civil War and Reconstruction, and the black response to the new racism of the late nineteenth century. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

- HST U338 African-American History since 1900 4 SH
Examines the modern development of black America, with major emphasis on the twentieth century and the rising tide of African-American nationalism. Provides an historical perspective regarding key contemporary issues including the founding of the National Association for the Advancement of Colored People (NAACP), the Marcus Garvey back-to-Africa movement, the Harlem Renaissance, the Black Muslims, the impact of Martin Luther King Jr. and the idea of Black Power. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U340 Cultural History of the U.S. 4 SH
Identifies, explains, and traces the evolution of some of the most important ideas and issues that have shaped American history and culture. Explores the tension between community and individualism in the context of debates and conflicts about religious belief and toleration; the nature of liberty, civic responsibility, and the state; immigration and ethnicity; race and gender relationships; and class distinctions. Considers the impact of advertising and the growing consciousness of the power of a consumer-driven culture in the early twentieth century, and explores the simultaneous enthusiasm for and concern about technological innovation. Helps students understand the ways in which popular and elite literature, film, and other electronic media, advertising, leisure pursuits, and religion are mined for information about a culture. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U341 History of the Western U.S. 4 SH
Examines the history of the western areas of North America that eventually became the United States. Topics include the history and culture of the indigenous peoples of the trans-Mississippi and far western United States; the political, economic, social, and cultural expansion of European settlers; cultural and military encounters of European and indigenous peoples; technological innovation and agriculture in the Great Plains, the Intermountain West, and the West Coast; cattle and sheep ranching; water and the West; ecology, conservation, and the politics of the "Sagebrush Rebellion"; Asian Americans in the West; mining; the Civil War in the West; African Americans and the Western experience; the cowboy and the importance of rodeo; and the West and the Native American in American popular culture (film, radio, television, literature, and advertising). *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U342 Environmental History of North America 4 SH
Takes a continental approach to studying the history of environmental change, since the natural world extends beyond national boundaries. Focuses on four natural resources in historical perspective: land, wildlife and habitat, water, and air. Uses major writings about the environmental history of Canada, the United States, Mexico, and the Central American republics. In addition to readings and writing assignments, students are required to use the materials and assignments located on the course Web site, which includes online readings and photographs, class notes and lectures, suggestions for research topics, and links to environmental Web sites located throughout North America. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U343 History of Business in America 4 SH
Traces the development of business from the colonial era to the present, with an emphasis on the industrial era (1840–1920s) and the modern period. Examines the factors that shaped commercialism and consumerism in the United States. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U344 U.S. Urban History 4 SH
Examines the development of urban society in the United States in the nineteenth and twentieth centuries, with emphasis on the effects of immigration and industrialization upon the politics, thought, and society of American cities. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U345 American Elites 4 SH
Examines the life of elite individuals and groups in American society, especially in the nineteenth and twentieth centuries. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U346 The American Empire 4 SH
Examines American expansionism from the Monroe Doctrine and manifest destiny to recent neo-imperialism and "globalization," with an emphasis on early twentieth-century expansion into Cuba, Hawaii, the Panama Canal Zone, the Philippines, Puerto Rico, Samoa, and other Pacific islands. Focuses on cultural encounters, political debates, the economic impact of imperialism, and the perspectives of colonized peoples. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U350 Modern China 4 SH
Explores the far-reaching political, economic, and social changes in China from 1800 to the present. Examines the decline of the empire, the impact of the West, the rise of nationalism and industrialization, the changing roles of women, the origins of rural revolution, and establishing the communist state. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U351 Japan since 1850 4 SH
Examines state formation, economic growth, imperialism and colonialism, war and defeat, and contemporary culture. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U370 Renaissance to Enlightenment 4 SH
Covers the social, economic, political, and cultural transformations of Europe from the Renaissance to the French Revolution. Traces the rebirth of Catholic Europe from 1300;

the Reformation; the religious wars; struggles over religious and scientific beliefs; advances in technology, science, and warfare; overseas expansion; the scientific revolution; and the Enlightenment. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U371 Europe 1870–1921 4 SH
Focuses on Europe from the Franco-Prussian War to the post–World War I settlement: the growing tensions and rivalries and the declining certainties of the end of the nineteenth century, the origins of World War I, the war itself, the Russian Revolution, and the Peace of Paris. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U372 Gender and Society in Modern Europe 4 SH
Examines the importance of gender difference in European societies from 1700 to the present. Explores the historical development of masculinity and femininity in European societies, with attention to social class and national differences. Looks at the importance of gender in the emergence of nation-states, in major democratic and socialist revolutions, in economic change, in claims for and the exercise of citizenship rights, and in the policies of welfare states. Explores how gender and race shaped women's agency, their engagement with imperialism and contacts with non-Europeans, women's participation in war and totalitarian regimes, their private lives and sexuality, and the significance of European Union policies for gender equality today. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U375 Culture and Identity in Early Modern England 4 SH
Examines the history of early modern England as well as Ireland, Wales, and Scotland. Follows the development of England from a small backwater to one of the most powerful European nations by the end of the seventeenth century. Analyzes the constantly shifting relationships between the various cultural identities within Britain. Concentrates on British history not only from the perspective of the elites but also from those of people whose names have often been lost to history. Key themes include the growth of the British Empire, issues of gender, the interactions between England and the Celtic fringes, and participation in the political franchise. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U376 The British Empire 4 SH
Studies the history of the empire in which the sun never set, from its earliest beginnings in the seventeenth century to its full growth in the nineteenth century. Traces the rise of Britain as a major world power. Topics include nationalism, the growth of capitalism and the international economy, the role of women, education, and native resistance movements. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U377 Ireland and the Irish Migration 4 SH
Traces the history of Ireland from the earliest times until the present day, with special emphasis on the period from the sixteenth century to the mid-twentieth century. Topics include national identity, popular perceptions of the Irish, social structures, and the political role of Ireland in the world. Also discusses the Irish diaspora, and its effect both on Ireland and on the wider world. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U385 Russian Literature in Translation 4 SH
Surveys and analyzes the major works of Russian literature of the nineteenth and twentieth centuries, with emphasis on the historical context. Selected writers include Pushkin, Gogol, Turgenev, Dostoyevsky, Tolstoy, and Chekhov. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U386 History of Soviet Cinema 4 SH
Surveys the emergence and development of the film industry in the USSR. Examines the political, economic, ideological, and artistic sources of Soviet cinema and their relationship to Russian culture and history. Directors include Eisenstein, Vertov, Pudovkin, Dovzhenko, Kozintsev, Kalatozov, and Tarkovsky. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U387 Soviet Secret Police 4 SH
Explores a vast array of primary and secondary sources, supplemented by literature and film, and traces the roles of the domestic and international branches of the Soviet secret police throughout its seventy-year history. Explores the role of ideology in Soviet clandestine organizations; the foundations of Soviet policing; political terror and denunciations; informants' networks; recruitment of agents at home and abroad; the British spy scandals of the 1930s–1950s; Soviet intelligence successes and failures in World War II; the origins of the Cold War; the atom spy networks; the popular culture of “spy mania” in the McCarthy era; the Cuban missile crisis; the Brezhnev era; the KGB and the Soviet collapse; and spies and spying in the post-Soviet era. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U388 Borderlands: World War II in Eastern Europe 4 SH
Devoted to the study of Russia's western borderlands before, during, and immediately following the Second World War, 1939–1948. Drawing from a variety of original documents, films, and recent scholarly studies, evaluates the impact of World War II on the Soviet Union and Eastern Europe. Examines the basic history of World War II in the East, followed by several weeks of readings on special themes: Soviet occupation policy (1939–1941); *Ostpolitik*; German occupation policy in Soviet territory, 1941–1945; genocide and the Holocaust; partisans and collaborators; nationalism; ethnic reprisals after the Soviet liberation of occupied zones; and the origins of the Cold War. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

- HST U390 Africa and the World in Early Times 4 SH
Addresses the place of Africa in the world, from human evolution to the establishment of large-scale iron-making societies. Examines debates on the evolution of man in Africa and migrations to other regions. Traces the formation and spread of language groups, the rise of agriculture, formation of family and political structures, and patterns of trade up to 1000 ad. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U391 Modern African Civilization 4 SH
Explores African history and culture from the early 1500s to the present era. Emphasizes the relationship between Europe and Africa, the circumstances surrounding the imperialist partition of Africa, and the decolonization process. *Prereq. Sophomore standing or above.*
- HST U392 African Diaspora 4 SH
Explores the creation and transformation of the African Diaspora—connections among communities of African descent in Africa, the Americas, Europe, and Asia. Centers on the years from 1500 to the present and emphasizes connections among themes of migration, identity, and popular culture. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U393 Islam and Empires 4 SH
Surveys Middle Eastern history from the era of Sulayman the Magnificent, the sixteenth-century Ottoman sultan, to the end of the twentieth century. Geographically, focuses on the lands of the former Ottoman Empire, Persia, and Iran. Thematically, focuses on the transformation of state and society under the impact of a changing world economy and European colonialism. Traces the transformation of powerful world empires in the sixteenth century, based on religious and dynastic authority, into secular, often military-ruled nation-states in the twentieth century. Also follows the Islamic fundamentalist backlashes that these developments provoked. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U394 Islamic Nationalism 4 SH
Traces the historical antecedents to contemporary resurgent Islamic nationalism. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U411 Environment in the Age of Discovery 4 SH
Explores the statement “There are two Europes and there are two Africas,” which describes the essence of this course, the exchange of people and all of the materials found in nature that we associate with people. Their migration across the Atlantic since the “discovery” of the New World by Christopher Columbus in 1492 has been one of the most significant continuing events in human history. We may dispute the notion of discovery by Europeans in the fifteenth century, since many millions of people inhabited North and South America at the time of Columbus’s arrival. His arrival, however, signaled the beginning of an exchange that has never ended. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U412 Global Environmental History 4 SH
Examines the impact of four significant human transitions on the environment of the planet Earth. They include the transition from hunting-gathering to settlement and the invention of agriculture about 10,000 years ago. The agricultural or neolithic revolution was followed thousands of years later by the urban revolution and ultimately the industrial revolution. These three important developments in world environmental history happened within specific millennia and simultaneously in different parts of the world. In the beginning, they were not the product of physical or cultural diffusion. Urbanization and industrialization, however, promoted worldwide migration that disrupted and changed the world’s ecology and environment in significant ways. Also explores the electronic revolution of the past century, which has had its own set of environmental impacts. *Prereq. HST U110.*
- HST U421 History through Film 4 SH
Explores various historical issues as seen through the eyes of historians and filmmakers. Presents both acted and documentary films in combination with readings from a variety of sources and interpretive materials. Through a series of case studies, the first half of the course looks at the ways in which filmmakers use (and abuse) history as a source of dramatic “stories,” while the second uses the same approach to understand the ways that historians use visual media to understand the politics and culture of the times they were made and as historical evidence. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U430 Political Reform in America 4 SH
Examines movements to reform government in the United States and their results, with an emphasis on the Progressive Era, the New Deal, the Great Society, and the “Reagan Revolution” during the twentieth century. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U431 American Jewish History 4 SH
Examines Jewish political, social, and cultural history from the arrival of the first group of Jews at New Amsterdam in 1654 to the present. Themes include immigration, adaptation, family life, religion, anti-Semitism, Zionism, the Holocaust, and American-Israeli relations. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*
- HST U432 Latin America in Boston 4 SH
Explores the experiences of Latin American and Caribbean origin groups—particularly Brazilians, Central Americans, Dominicans, Haitians, Puerto Ricans, and West Indians—in twentieth-century Boston. Studies the historical, economic, political, and cultural forces affecting immigration from each country. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U450 Engendering China 4 SH
Presents an historical analysis of gender dynamics and roles in China from late imperial times to the present. Examines notions of masculinity and femininity in Confucian culture, patriarchal practices including foot binding, chastity arches, and arranged marriages, and the ways in which the Chinese empire becomes feminized in the eyes of its elite as a result of Western intrusions. Explores women's efforts to acquire "personhood" and the rights of citizens during the period of nation building and to negotiate state regulatory powers over their labor, sexuality, and reproduction in recent times. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U452 Global Chinese Migration 4 SH
Explores how the Chinese have been moving and creating communities around the world for centuries. What, if anything, makes them "Chinese" despite such a large variety of historical experiences? Attempts to understand this migration both in terms of large-scale trends and the unique experiences of local communities and cultural change. Also examines Chinese business networks, which are sometimes thought to present a powerful challenge to Western forms of capitalism. Is Chinese capitalism different from other capitalist business, and does Chinese culture play a role in shaping it? *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U475 The Culture of Europe 4 SH
Provides an analysis of the culture of the West (encompassing a geographic region stretching from Moscow to the Pacific) from the end of the Renaissance to the present, focusing on the conjunction of environmental, political, economic, social, cultural, and psychological forces that encouraged or discouraged creativity. Considers the interconnections among the arts, social sciences, and sciences within each of the periods covered. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U477, HST U478, HST U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

HST U485 Vienna, Prague, Budapest 4 SH
Examines the intellectual and cultural history of these three closely linked capitals of Central Europe, their relationship to empires, multinationalism, and the development of modernism before and after World War I. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U486 Commissars and Managers: Soviet Economic History 4 SH
Provides an economic history of the Soviet Union from 1917 to the present. Working in lectures and the computer lab, students use tactics and methods of modern business, economics,

and management strategy as a means to understand, interpret, and evaluate Soviet economic policies and the history of Soviet economic development. Special themes include discussions of the purge of industrial managers as "wreckers"; the labor incentives of *Stakhanovism*—the Stalinist star system for extraordinary labor productivity; the economics of forced labor and the Gulag; the Second World War; financing the Cold War; the black market; corruption; and the central role played by former communists in the transition to capitalism (*nomenklatura privatization*). *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

HST U537 Issues/Problems in Public History 4 SH
Examines and analyzes major problems in public history in the United States and the world. Issues confronted include the nature and meaning of national memory and myth; the theory and practice of historic preservation; rural and land preservation and the organizational structures and activities associated with those efforts; the interrelationship of historical museums and popular culture; the history and organization of historic house museums; historical documentary filmmaking; historical archaeology in world perspective; interpreting "ordinary" landscapes; and the impact of politics on public history. *Prereq. Permission of instructor.*

HST U538 Managing Nonprofit Organizations 4 SH
Examines the management of nonprofit organizations, which include historical agencies, museums, archives, historic houses, and various special historical collections. Covers public management of complex organizations with all of their institutional components and human complexities. Studies planning in the public sector; budgeting, fundraising, conflict resolution, and the human relations literature as it relates to becoming a functional and successful manager. *Prereq. Permission of instructor.*

HST U539 Media and History 4 SH
Introduces students to the variety of chemical and electronic media, and the appropriate uses of these media for teaching, preservation, outreach, and primary research documents. Each student engages in research related to the selection and evaluation of existing media, and on the deconstruction, analysis, evaluation, and assembly of documentary presentations. Students then form research and production teams for the creation of media production, which takes place during the semester. Topics such as media preservation, production budgeting, marketing, and intellectual property are also covered. *Prereq. Permission of instructor.*

HST U540 Historical Societies and Archives 4 SH
Analyzes the varieties of historical societies (local, state, and national) and the kinds of private (business, college, and church) and public (local, state, and national) archives. Discusses activities and procedures of historical societies and archives as well as their similarities and differences. *Prereq. Permission of instructor.*

HST U541 Historical Exhibits and Museums Studies approaches, techniques, and special problems in the presentation of history to the public through exhibits, films, and other audio-visual and written media. <i>Prereq. Permission of instructor.</i>	4 SH	HST U600 Topics in Women's History Covers special topics in the history of women and gender. <i>Prereq. Junior or senior standing.</i>	4 SH
HST U542 Historical Editing Introduces the practice and skills of historical editing. Emphasis is on identification and explication of documents within their historical context in preparation for publication. Presents a laboratory for the study and practice of historical editing. Introduces the major collections of edited papers and instructs students in editing historical documents. Gives each student a historical document to prepare for publication. Also covers the editing of history books and journals. <i>Prereq. Permission of instructor.</i>	4 SH	HST U610 Topics in World History Covers special topics in world history. <i>Prereq. Junior or senior standing.</i>	4 SH
HST U543 Industrial Archaeology Introduces the history, practice, and place of industrial archaeology. Plans examination of techniques and procedures used to unearth the industrial past and field trips to local industrial sites. <i>Prereq. Permission of instructor.</i>	4 SH	HST U620 Topics in Historical Geography Covers special topics in the ways in which geographic, climatic, environmental, and demographic factors have affected the course of history. Tools such as GIS (geographic information systems) are introduced and explored to enhance understanding of these complex interrelationships. <i>Prereq. Junior or senior standing.</i>	4 SH
HST U544 Historic Preservation Introduces historic preservation, with attention to the history, the philosophy, and the practical problems of preservation. <i>Prereq. Permission of instructor.</i>	4 SH	HST U630 Topics in American History Covers special topics in the history of America in the nineteenth and twentieth centuries. <i>Prereq. Junior or senior standing.</i>	4 SH
HST U545 Historical Analysis of Public Policy Introduces the historical study of public policy, concentrating on the theoretical and methodological issues. Substantive illustrations focus mainly on the United States. <i>Prereq. Permission of instructor.</i>	4 SH	HST U631 Topics in Public History Covers special topics in public history. <i>Prereq. Junior or senior standing.</i>	4 SH
HST U546 Oral History Discusses the theory and practice of creating, processing, and using primary source material obtained by taping interviews with people whose role in history would otherwise go unrecorded. <i>Prereq. Permission of instructor.</i>	4 SH	HST U640 Topics in African-American History Covers special topics in African-American history. <i>Prereq. Junior or senior standing.</i>	4 SH
HST U547 Historical Reenactment Explores the methodologies and approaches involved in historical reenactment. Introduces students to live representation of an historic individual within the context of the correlating historical time period. Historical reenactment synthesizes the tools of historical research with those of live performance and audience interaction. <i>Prereq. Permission of instructor.</i>	4 SH	HST U650 Topics in Asian History Covers special topics in Asian history. <i>Prereq. Junior or senior standing.</i>	4 SH
HST U548 Historical Administration Examines complex, formal organizations with the focus on historical agencies. Studies include personnel relationships, the characteristics of successful managers, and strategic planning. Issues of finance, budgeting, and proposal writing are priorities in this professional course for students with a concentration in public history. <i>Prereq. Permission of instructor.</i>	4 SH	HST U660 Topics in Latin American History Covers special topics in the history of the Caribbean and Latin America. <i>Prereq. Junior or senior standing.</i>	4 SH
		HST U670 Topics in European History Covers topics in European history from antiquity to the present. <i>Prereq. Junior or senior standing.</i>	4 SH
		HST U677, HST U678, HST U679 Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each
		HST U680 Topics in Russian History Covers special topics in Russian history. <i>Prereq. Junior or senior standing.</i>	4 SH
		HST U681 Topics in Soviet History Covers special topics in Soviet history. <i>Prereq. Junior or senior standing.</i>	4 SH
		HST U682 Topics in East European History Covers special topics in East European history. <i>Prereq. Junior or senior standing.</i>	4 SH

HST U690 Topics in African History	4 SH	HST U941 Internship in World History	4 SH
Covers special topics in African history. <i>Prereq. Junior or senior standing.</i>		Offers a formal internship at the World History Resource Center for preservice teachers of history during the fall semester of the fourth year. Students read curriculum units prepared by other teachers and develop at least one substantial, multi-lesson unit of world history curriculum under supervision of a history faculty member and in consultation with a practicing teacher. Fulfills experiential education requirement. <i>Prereq. Permission of instructor.</i>	
HST U695 Population in History	4 SH	HST U951 Experiential Education Directed Study 1	4 SH
Examines through population studies and historical demography the causes and consequences of changes in human marriage, birth, death, and migration rates from the Stone Age to the present on a global scale. Focuses on the role of the environment, relative economic growth, differential nutritional status, epidemic disease, family systems, and public administration in tracing the modern population explosion, highlighting the process through which human agency brought contagious diseases under better control and extended human life expectancies before medicine could cure disease.		HST U952 Experiential Education Directed Study 2	4 SH
HST U699 Advanced Television Production	4 SH	Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement. <i>Prereq. Permission of instructor.</i>	
Provides students with guidance in the development of special projects in television and video production. Topics include advanced directing (studio and field), lighting, scriptwriting, editing, graphics, and postproduction technology. <i>Prereq. Junior or senior standing.</i>		HST U970 Junior/Senior Project 1	4 SH
HST U701 Capstone Seminar	4 SH	Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i>	
Practices advanced techniques in historical research and writing. <i>Prereq. HST U301.</i>		HST U971 Junior/Senior Project 2	4 SH
HST U903 Fieldwork in History 1	4 SH	Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. HST U970 and honors program participation.</i>	
Offers directed work in historical societies, archives, museums, and other historical agencies. Please consult the department for details. Fulfills the College of Arts and Sciences experiential education requirement. <i>Prereq. HST U301 and at least 16 SH in additional history course work.</i>		HST U977 Directed Study in Managing Nonprofit Organizations	4 SH
HST U904 Fieldwork in History 2	4 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>	
Offers directed work in historical societies, archives, museums, and other historical agencies. Please consult the department for details. Fulfills the College of Arts and Sciences experiential education requirement. <i>Prereq. HST U301 and at least 16 SH in additional history course work.</i>		HST U978 Directed Study in Historical Societies and Archives	4 SH
HST U911 Senior Project 1	4 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>	
Offers advanced directed research under the guidance of history faculty. <i>Prereq. HST U301 and permission of the department.</i>		HST U979 Directed Study in Historical Exhibits and Museums	4 SH
HST U912 Senior Project 2	4 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>	
Offers advanced directed research under the guidance of history faculty. <i>Prereq. HST U301 and permission of the department.</i>		HST U980 Directed Study in Historical Editing	4 SH
HST U921 Directed Study	1 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>	
HST U922 Directed Study	2 SH	HST U981 Directed Study in Historical Consulting	4 SH
HST U923 Directed Study	3 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>	
HST U924 Directed Study	4 SH		
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i>			

HST U982 Directed Study in Industrial Archaeology	4 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>	history of current international issues through lectures, guest lectures, films, case studies, and readings across the disciplines.	
HST U983 Directed Study in Historic Preservation	4 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>		IAF U277, IAF U278, IAF U279 1 SH each Honors Adjunct Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>
HST U984 Directed Study in Material Culture	4 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>		IAF U400 International Conflict and Negotiation 4 SH Offers an interdisciplinary approach to analyzing international conflict and negotiations: how conflicts evolve, are managed, and/or resolved. In dealing with different types of regional and international conflicts, students focus on historical, ethnic, religious, geographic, and political aspects of a variety of conflicts and the consequences these conflicts hold for regional and international actors. <i>Prereq. IAF U101 and POL U160.</i>
HST U985 Directed Study in Historical Analysis of Public Policy	4 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>		IAF U477, IAF U478, IAF U479 1 SH each Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>
HST U986 Directed Study in Publishing for Nonprofits	4 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>		IAF U677, IAF U678, IAF U679 1 SH each Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>
HST U987 Directed Study in Oral History	4 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>		IAF U700 Senior Capstone Seminar in International Affairs 4 SH Offers a capstone course for IAF majors returning from international experience (study abroad, co-op experience, or internship). Develops one or two main topics to be investigated as a senior research seminar. Topics vary each year and may include emerging economies, international relations, global drug trade, global fight against terrorism, world trade, and other issues of globalization. <i>Prereq. Senior standing and international experience.</i>
HST U988 Directed Study in Genealogical Research	4 SH	Permits students who have completed course work on this subject to undertake advanced applications of study. <i>Prereq. Permission of instructor.</i>		IAF U900 Special Topics 1 SH Covers selected topics in current events in global affairs and international studies. <i>Prereq. Permission of instructor.</i>
HST U989 Directed Study in Media and History	4 SH	Permits students who have completed course work on this subject to undertake advanced individual applications projects in media and history. <i>Prereq. Permission of instructor.</i>		IAF U904 Special Topics 4 SH Covers selected topics in current events in global affairs and international studies. <i>Prereq. Permission of instructor.</i>
HST U990 Editing for Historical Publication	4 SH	Gives students who have produced an original piece of historical research and writing the opportunity to prepare the manuscript for publication in the history department's online journal: experiential education in historical copyediting, revision, and online presentation. <i>Prereq. Permission of instructor.</i>		IAF U921 Directed Study 1 SH IAF U922 Directed Study 2 SH IAF U923 Directed Study 3 SH IAF U924 Directed Study 4 SH Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i>
INTERNATIONAL AFFAIRS				
COLLEGE OF ARTS AND SCIENCES				
IAF U100 College: An Introduction	1 SH	Introduces first-year international affairs students to the majors, the departments servicing IAF, and the University as a whole; familiarizes students with the skills needed for success as a university student.		
IAF U101 Introduction to International Affairs	4 SH	Offers an interdisciplinary approach to analyzing global/international affairs. Examines the politics, economics, culture, and		

IAF U951 Experiential Education Directed Study 1 SH
 IAF U952 Experiential Education Directed Study 2 SH
 IAF U953 Experiential Education Directed Study 3 SH
 IAF U954 Experiential Education Directed Study 4 SH
 Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement. *Prereq. Permission of instructor.*

IAF U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

IAF U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. IAF U970 and honors program participation.*

INTERNATIONAL BUSINESS ADMINISTRATION

COLLEGE OF BUSINESS ADMINISTRATION

INB U201 Global Environment of International Business 4 SH
 Focuses on the context within which international business functions. Offers students the perspective of an international manager dealing with geographic and cultural awareness; international business vocabulary; the roles of international and global institutions such as the International Monetary Fund (IMF), World Bank, and World Trade Association (WTO). Discusses regional and global trade agreements such as the European Union (EU), North American Free Trade Agreement (NAFTA), and Mercosur.

INB U277, INB U278, INB U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

INB U301 Living and Working Abroad 4 SH
 Prepares BSIB students to live and work abroad as part of their degree program. Develops an awareness of the influence of culture on how people live, work, and manage. Helps develop the abilities of students to function effectively in situations of cultural diversity while studying abroad and in their co-op assignment in other countries. *Prereq. BSIB students only; taken prior to studying abroad.*

INB U310 Cultural Aspects of International Business 4 SH
 Helps develop awareness of the hidden influence of culture on behavior, particularly with respect to management and

management practices. With the increasing globalization of business, many managers find themselves being managed by, or collaborating with, people of different nationalities and cultures. Develops the ability to recognize, understand, and work with the cultural diversity that affects business conducted across national and cultural boundaries. *Prereq. 64 SH toward degree.*

INB U477, INB U478, INB U479 1 SH each
 Honors Adjunct
 Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

INB U501 Advanced Global Management 4 SH
 Applies the concepts and skills acquired in the other international business courses. Focuses on solving managerial problems in international and multicultural contexts and uses case analysis to focus on business strategy and policy related to international operations. *Prereq. INB U201.*

INB U602 European Union and Globalization 4 SH
 Explores a range of economic, political, and social issues confronting the European Union, its member countries, its neighbors, and its trading partners. As it continues its remarkable process of economic integration with the introduction of a common currency, the European Union faces major challenges and opportunities. The powerful forces of globalization have created an anti-globalization backlash that is central to debates on the future of Europe. Through cases, library and field research, and guest speakers, students develop a deeper understanding of the problems and potential of European integration. Also allows students participation in a unique transatlantic, Internet-based virtual seminar with students and faculty of international business in Germany, France, Spain, and Ireland. *Prereq. Honors program participation or permission of instructor.*

INB U677, INB U678, INB U679 1 SH each
 Honors Adjunct
 Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

INB U921 Directed Study 1 SH
 INB U922 Directed Study 2 SH
 INB U923 Directed Study 3 SH
 INB U924 Directed Study 4 SH
 Allows students who have received approval to undertake independent study in lieu of any course required in the various concentrations. Students present proposals to an Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study takes place. A copy of the final report prepared by the

student is presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from concentration coordinators. *Prereq. Permission of instructor.*

INB U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

INB U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. INB U970 and honors program participation.*

INTERDISCIPLINARY

COLLEGE OF ARTS AND SCIENCES

INT U100 College: An Introduction 1 SH
Intended for first-year students in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

INT U103 Women's Studies 4 SH
Examines various perspectives on the social construction of gender—what it means socially to be a woman or man—and the ways in which gender is a central organizing principle in our lives. In other words, examines, analyzes, and challenges gender differences, gender stereotypes, and gender inequalities. Seeks to understand and change the gender hierarchies that shape and constrain people's lives. Also inquires into the ways in which women deploy their gender identities to participate in social movements, both political and religious, to address issues of women's health and control over reproduction, as well as to challenge social norms in their roles as writers, artists, and activists.

INT U120 Exploring the Humanities through Film 4 SH
Investigates the ways in which the methods of the humanities can expand one's awareness of the sources, statements, and meanings of popular films. Presents films for evaluation in the light of reading, various approaches presented by faculty members from a number of humanistic disciplines, and student's own experiences.

INT U150 East Asian Studies 4 SH
Concentrates on China and Japan, and addresses Korea and Vietnam where possible, providing an understanding of the constituent characteristics that originally linked East Asia as a region and the nature of the transformations that have occurred in the region over the last two thousand years. This introductory course is given in the autumn term of each year and is required of all students minoring in East Asian Studies. Cross-listed with the Interdisciplinary Studies Program, it seeks to provide students with effective interdisciplinary analytical skills as well as historical, ethical, cultural diversity, and aesthetic perspectives.

INT U200 Marine Studies 4 SH
Surveys the issues and methodologies involved in the interdisciplinary study of marine environments. Examines the physical, biological, social, and historical processes that interact in this complex system. Guest lectures provide an overview of the range of disciplines in the study of the world's oceans.

INT U210 Marine Mammals 4 SH
Designed to familiarize students with biology and conservation of marine mammals. The course content is primarily scientific, but the goal of the course is to consider how scientific knowledge is used as a tool of conservation. Topics include the evolution and taxonomy of whales, seals, and other marine mammals, adaptations to the ocean environment, feeding and social behavior, and population ecology. Issues include whaling and sealing, environmental contaminants, entanglements in fishing gear, tuna/dolphin interactions, and the decline of Steller Sea lions.

INT U220 Latino, Latin American, and Caribbean Studies 4 SH
Offers an interdisciplinary introduction to Latinos and people of Latin American and Caribbean origin in the United States as well as to the regions of Latin America and the Caribbean. Dispels a series of powerful myths associated with U.S. Latinos and in Latin American and Caribbean society, such as racial inferiority, poverty, machismo, and violence. Introduces the construction of Latino, Latin American, and Caribbean identities as well as the politics, economics, history, and culture.

INT U240 War and Conflict in the Nuclear Age 4 SH
Examines the sources and nature of conflict since the invention of nuclear weapons during World War II, along with the impact of nuclear weapons on war and conflict and on attempts to respond to military and other threats. Central questions are: How does the existence of nuclear weapons affect conflicts? What can be done to diminish the threat of both nuclear and nonnuclear wars and conflicts?

INT U250 ELMO Music Module 1 2 SH
Offers a laboratory course designed to integrate concepts and methods of science into the music curriculum. Subjects from across the spectrum of the sciences and engineering with particular relevance to the music disciplines are used to build

quantitative and critical thinking skills and a knowledge base in science and technology. Topics relevant to music majors include the wave nature of sound; the sound of a musical instrument; the relation of pitch, tone, and timbre to the instruments' shape, sound, and pitch perception; and acoustical properties of materials and rooms. A sense of the magic and mystery of science is reinforced throughout the course by dramatic demonstrations and hands-on activities.

INT U252 ELMO Music Module 2 2 SH
Continues INT U250. Topics are explored in greater depth as students strengthen their quantitative and critical thinking skills in the context of key principles of science and engineering relevant to music students. *Prereq.* INT U250.

INT U260 ELMO Art Module 1 2 SH
Offers a laboratory course designed to integrate concepts and methods of science into the art and architecture curriculum. Subjects from across the spectrum of the sciences and engineering with particular relevance to the art and architecture disciplines are used to build quantitative and critical thinking skills and a knowledge base in science and technology. Topics relevant to art and architecture majors include science in art; art in science; wave and ray aspects of light; the science of vision and perception; science of paints, pigments, and dyes; sciences and engineering in materials and structures; and art restoration and forgery detection. A sense of the magic and mystery of science is reinforced throughout the course by dramatic demonstrations and hands-on activities.

INT U262 ELMO Art Module 2 2 SH
Continues INT U260. Topics are explored in greater depth as students strengthen their quantitative and critical thinking skills in the context of key principles of science and engineering that are relevant to art and architecture students. *Prereq.* INT U260.

INT U270 ELMO Theatre Module 1 2 SH
Offers a laboratory course designed to integrate concepts and methods of science into the theatre curriculum. Subjects from across the spectrum of the sciences and engineering with particular relevance to the theatre disciplines are used to build quantitative and critical thinking skills and a knowledge base in science and technology. Topics relevant to theatre majors include the wave nature of the voice and other aspects of sound; the science of the voice and vocal production; wave and ray aspects of lights; acoustical properties; and the science of pitch and perception. A sense of the magic and mystery of science is reinforced throughout the course by dramatic demonstrations and hands-on activities.

INT U272 ELMO Theatre Module 2 2 SH
Continues INT U270. Topics are explored in greater depth as students strengthen their quantitative and critical thinking skills in the context of key principles of science and engineering that are relevant to theatre students. *Prereq.* INT U270.

INT U277, INT U278, INT U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

INT U285 Jewish Religion and Culture 4 SH
Explores the basic features of Judaism in the ancient, rabbinic, and modern periods. Employs an historical critical approach to the formative texts and their interpreters. Analyzes Jewish practices within specific historical contexts and discusses the ways in which practices relate to the texts and history of Judaism. Examines the rich varieties of Jewish cultural expressions.

INT U300 The Ocean World 4 SH
Provides a comprehensive, interdisciplinary introduction to the oceans. Focuses on the seas' complexity and the far-reaching consequences of our interactions with them. Draws on specialists in the sciences, social sciences, humanities, and arts, each with an interest in marine issues and a commitment to bridging the gaps among disciplines. The course themes are broad, but, when appropriate, focus on Boston Harbor, a first step into the ocean world for this area. *Prereq.* Permission of instructor.

INT U305 Maritime History of New England 4 SH
Surveys maritime transportation, trade, travel, exploration, and warfare from approximately 3500 BC to the end of the wooden boat era in the late nineteenth century. Prior to the widespread application of steam power on land and sea, ships were the fastest, safest, and most economical means of transporting large cargoes over long distances. Literary and art history sources are also introduced, along with several films on maritime archaeology. *Prereq.* Permission of instructor.

INT U310 Water Resources Policy and Management 4 SH
Explores the ways in which water has affected our bodies, our planet, our history, our culture, and the danger posed by increasing demand, waste, and pollution on our limited supply of usable fresh water. Considers water through scientific, historical, and cultural viewpoints. Surveys contemporary water problems in all their dimensions—political, economic, and technological. *Prereq.* Permission of instructor.

INT U315 Wetlands: Ecology and Hydrology 4 SH
Investigates the vital role of wetlands in the hydrology and ecology of global landscapes. Topics include function of inland and coastal marshes, and swamps and bogs in water and nutrient cycles, and in support of biodiversity from microbes to vertebrates. Examines biological links between wetlands and human activities, such as agriculture, coastal development, and fisheries. Also covers legal framework for the protection and restoration of endangered wetlands. *Prereq.* Permission of instructor.

<p>INT U325 Coastal Zone Management 4 SH Focuses on outstanding issues in coastal environment affairs. Discusses scientific, legal, economic, and technical aspects of coastal issues and integrates them into problem-solving exercises. Prereq. Permission of instructor.</p>	<p>INT U420 Television Studio Production 4 SH Introduces studio production techniques. Covers the creative and technical elements of video production, camera operation, floor direction, editing graphics, lighting, picture, composition, and directing methods. Prereq. Permission of instructor.</p>
<p>INT U339 Analysis of American Racism 4 SH Discusses the cycle by which racism in our institutions helps form our attitudes and the manner in which our attitudes, in turn, shape our institutions. Emphasizes the practical, day-to-day aspects of racism, rather than the theoretical and historical. Prereq. Sophomore standing or above.</p>	<p>INT U441 Topics in Women's Studies 4 SH Covers special topics in women's studies.</p>
<p>INT U354 Psychology and Film 4 SH Uses selected films to investigate psychological subjects including human development over the life cycle (particularly childhood and adolescence), family dynamics, sexuality, and psychopathology (trauma, anxiety and eating disorders, and psychosis). Prereq. PSY U101.</p>	<p>INT U443 Topics in Russian Studies 4 SH Covers special topics in Russian studies.</p>
<p>INT U357 Growth/Decline of Cities and Suburbs 4 SH Introduces students to the field of urban studies. Focuses on three central issues: how cities and suburbs evolve, what makes a city or suburb a good place to live, and how cities and suburbs are (or are not) planned. Students review the ways in which urban scholars and practitioners study cities and suburbs, their research methodologies, definition of issues, and division of labor among different disciplines. Students explore the roles of individuals, communities, the private sector, and government in planning and shaping the city.</p>	<p>INT U444 Topics in Japanese Studies 4 SH Covers special topics in Japanese studies.</p>
<p>INT U358 Current Issues in Cities/Suburbs 4 SH Introduces students to pressing urban issues: urban sprawl, poverty, education, transportation, economic development, and housing, through an intensive analysis of the Boston metropolitan area. The course is co-taught by University faculty and practitioners in government, community, and nonprofit organizations throughout the metropolitan area. Offers students the opportunity to analyze Boston data, go on outings to see development in progress, talk with urban practitioners about what they do, and conduct research on an urban issue of their choice.</p>	<p>INT U445 Topics in Leadership 4 SH Covers special topics in leadership.</p>
<p>INT U405 Creative Inquiry in Arts Research and Performance Studies 4 SH Offers an arts and technology experimental studio lab in qualitative research. Provides advanced experimentation in new media innovation. Students interested in interdisciplinary careers in the arts, sciences, and the impact of new arts and media technologies work in a collaborative learning environment on individual and group projects. The learning environment is called Model IMP (Intergenerational Mentoring Program). Students are offered an array of existing research projects linked with research-active faculty or arts professionals in visual and performance arts media. While final research projects are a projected outcome, a major learning component is the observation of how knowledge is transmitted across generations, cultures, and disciplines. Prereq. Permission of instructor.</p>	<p>INT U446 Topics in Documentary Production 4 SH Covers special topics and studies in documentary production. Prereq. Permission of instructor.</p>
	<p>INT U451 Women's Studies Module 1 SH Permits specialized women's studies topics to be studied as part of more general courses.</p>
	<p>INT U452 Cinema Studies Module 1 SH Permits specialized cinema studies topics to be studied as part of more general courses.</p>
	<p>INT U455 Leadership Studies Module 1 SH Permits specialized leadership studies topics to be studied as part of more general courses.</p>
	<p>INT U460 Jewish Film 4 SH Explores major themes and issues in American Jewish life—assimilation and intermarriage, anti-Semitism, the Holocaust—through the lens of popular film. Includes weekly screenings of films such as <i>Annie Hall</i> and <i>The Producers</i> and readings, lectures, and discussions.</p>
	<p>INT U465 Topics in Interdisciplinary Studies 4 SH Covers special topics in interdisciplinary studies.</p>
	<p>INT U470 War and Music 4 SH Offers an interdisciplinary and comparative exploration of the diverse ways in which composers, artists, novelists, poets, and dramatists have depicted the excitement, glory, agony, and sacrifice of war both at the dawn of modern gunpowder-based warfare in the seventeenth and eighteenth centuries and as the full impacts of “industrialized killing” became visible in the twentieth. Drawing on artistic and literary artifacts and the massive cultural outpourings that the slaughter and destruction of the two world wars elicited, students investigate how artists’ interactions with the experience and meaning(s) of war have developed and changed in the modern world and how those changes have affected our own understanding of its impact and significance. Prereq. Permission of instructor.</p>

- INT U500 Advanced Seminar in Marine Studies 4 SH
Focuses on outstanding issues in the marine environment. Using a seminar format, students from colleges and universities throughout the Boston area convene to address the complex interactions of disciplines including scientific, legal, economic, and technical aspects of issues that come into play in marine affairs. Seminars are led by experts actively involved in the issues. *Prereq.* INT U200 and permission of instructor.
- INT U501 Contemporary Issues: Hip-Hop Culture 4 SH
Surveys the global impact of hip-hop culture on a new generation of young people. Begun in the 1970s and 1980s in the United States as a cross-cultural expression of black and Puerto Rican traditions, it has become a major force worldwide. Using an interdisciplinary and practice-oriented approach, addresses such issues as youth identity formation, the role of women and gender in rap music, and the use of novel expressive forms. The combination of fieldwork and weekly critiques on contemporary public debates (such as censorship and the American Constitution, violence and aggression, and sexism and misogyny) will yield a final document to be presented to the University community and to be deposited in the Twenty-first Century Hip-Hop Library and Archive Project. *Prereq.* 64 SH toward degree or junior or senior standing.
- INT U520 Television Field Production 4 SH
Offers advanced training in video production techniques, emphasizing remote location shooting. Includes location scouting, production budgets. Also covers writing techniques, equipment location, postproduction editing, and content analysis. Offers the opportunity to work in teams to produce and direct television using remote video equipment. *Prereq.* Permission of instructor and 64 SH toward degree.
- INT U600 Contemporary Issues: Race, Science, and Technology 4 SH
Examines the social impact of diverse forms of technological development and application that will have sweeping effects on the everyday lives of individuals, groups, governments, and societies in the twenty-first century. Explores the global, transforming effects of technology as it affects communities of color in the United States and internationally in three main areas: the computer, DNA, and quantum revolutions. Topics include the digital divide, minority media ownership, human cloning, the “dot.com” phenomenon, race and cultural representations in cyberspace, and biopiracy. Lectures, class discussions, fieldwork, and interaction with leaders in these various fields are integral elements of the course. *Prereq.* 64 SH toward degree or junior or senior standing.
- INT U640 Topics in Jewish Studies 4 SH
Covers special topics in Jewish studies.
- INT U660 Jewish Studies Module 1 SH
Permits specialized Jewish studies topics to be studied as part of more general courses.
- INT U677, INT U678, INT U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.
- INT U699 Advanced Television Production 4 SH
Provides students with guidance in the development of special projects in television and video production. Studies include advanced directing (studio and field), lighting, scriptwriting, editing, graphics, and postproduction technology. *Prereq.* Permission of instructor.
- INT U905 Cultural Studies: An International Discourse 4 SH
Identifies the dominant and emerging trends and paradigms in the field of cultural studies in the United States and in the international community. Introduces students to the cross-disciplinary concerns and intellectual issues of ethnic studies, labor studies, gender/feminist studies, popular culture, race/racism policies, arts policy research, cultural and literary analysis, media production and consumption, film studies, performance studies, public and private patronage, and new information technologies research. Examines the various theories and methodologies associated with the cultural studies movements and the diverse authors and activists who have played a role in the production of cultural studies as a field of inquiry and practice. A review of classical theorists and major innovators introduces students to the broad influences of culture on individuals, groups, governments, and society. *Prereq.* Permission of instructor.
- INT U906 Social/Economic Development Lab 4 SH
Geared toward students who intend to pursue career paths in the international arena in the social sciences, humanities, and business. Introduces students to the major macro-social, geopolitical, and human rights theories and approaches to development as they have emerged in the international community. The new role relating development to culture and the importance of linking economic development with greater individual freedoms is a key aspect of the course, contrasting new and old development models. Popular concepts such as haves/have nots, rich/poor, and women’s empowerment are debated as human rights concerns that now dominate international debates. *Prereq.* Permission of instructor.
- INT U910 NUCASE Ethics Forum: Business 1 SH
Considers ethical concerns and decisions regarding privacy, fairness, and social responsibility (among others) that are increasingly important in the workplace. Helps students identify and think about such issues while they are on a co-op job. While on co-op, students participate in an ongoing series of reflective conversations with faculty and peers about ethics in the workplace. These conversations draw upon both the students’ current work experiences and information regarding professional ethics in the field of business. Students attend on-campus discussions and participate in Web-based conversations. *Prereq.* Permission of instructor.

INT U911 NUCASE Ethics Forum: Criminal Justice 1 SH
 Considers ethical concerns and decisions regarding privacy, fairness, and social responsibility (among others) that are increasingly important in the workplace. Helps students identify and think about such issues while they are on a co-op job. While on co-op, students participate in an ongoing series of reflective conversations with faculty and peers about ethics in the workplace. These conversations draw upon both the students' current work experiences and information regarding professional ethics in the field of criminal justice. Students attend on-campus discussions and participate in Web-based conversations. *Prereq. Permission of instructor.*

INT U912 NUCASE Ethics Forum: Science 1 SH
 Considers ethical concerns and decisions regarding privacy, fairness, and social responsibility (among others) that are increasingly important in the workplace. Helps students identify and think about such issues while they are on a co-op job. While on co-op, students participate in an ongoing series of reflective conversations with faculty and peers about ethics in the workplace. These conversations draw upon both the students' current work experiences and information regarding professional ethics in the field of science and allied fields. Students attend on-campus discussions and participate in Web-based conversations. *Prereq. Permission of instructor.*

INT U940 Student Leadership Practicum 4 SH
 Considers how undergraduate students make pivotal contributions to governance, services, and the quality of daily life at Northeastern University through student government and other activities, ranging from residential services to publication of the campus newspaper. Gives students involved in such on-campus leadership roles an opportunity to participate in a course-based seminar related directly to their service. The objective is to incorporate student leadership into the general framework of experiential education by such means as reflective discussions, meetings with University administrators, group projects, and exposure to academic perspectives on leadership. As part of this practicum, students participate in parts of the "President's Leadership Institute," a module-based exploration of leadership principles within both educational and community settings. *Prereq. Permission of instructor.*

INT U941 Forensics Practicum 1 SH
 Provides students with hands-on experience in forensics techniques and theory. *Prereq. Permission of instructor.*

INT U943 Community-Based Research Practicum 4 SH
 Involves students in applied social research projects that are defined in partnership with local civic, public affairs, and social service groups. Students collaborate on a final report that is presented to the community partner at the end of the course. *Prereq. Permission of instructor.*

INT U945 Cinema Studies Practicum 1 SH
 INT U946 Cinema Studies Practicum 1 SH
 INT U947 Cinema Studies Practicum 2 SH
 INT U948 Cinema Studies Practicum 2 SH
 INT U949 Cinema Studies Practicum 3 SH

Provides students with hands-on experience in cinema techniques or theory. *Prereq. Permission of Interdisciplinary Studies Department.*

INT U954 Experiential Education Directed Study 4 SH
 Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement. *Prereq. Permission of instructor.*

INT U960 Service Learning 4 SH
 Provides students with opportunities to engage in real-world experiences with nonprofit organizations related to their fields of study. *Prereq. Permission of instructor.*

INT U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

INT U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. INT U970 and honors program participation.*

INFORMATION SCIENCE

COLLEGE OF COMPUTER AND INFORMATION SCIENCE

IS U277, IS U278, IS U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

IS U300 Principles of Information Science 4 SH
 Surveys the key theories, concepts, and themes of information science. Examines information and communication technologies from the perspective of the people and organizations that generate and use information to achieve their goals. Topics include information and decision making; human information processing; definition and types of information systems; behavioral impact of information technologies such as office automation, e-mail, and the World Wide Web; and legal and policy issues such as privacy, censorship, intellectual property, and information security. A course project explores the use and impact of information technology in a selected domain (such as e-commerce, education, medicine, government, law enforcement, or electronic publishing), focusing on both technical and behavioral issues. *Prereq. CS U200 and CS U211.*

- IS U470 Information System Design and Development 4 SH
Discusses the planning, analysis, design, and implementation of computer-based information systems, focusing on the methodologies and procedures used in organizational problem solving and systems development. Topics include the systems development life cycle; project management; requirements analysis and specification; feasibility and cost-benefit analysis; logical and physical design; prototyping; and system validation, deployment, and postimplementation review. Additional topics may include platform and database selection and integration issues; CASE tools; end-user training; maintenance; and object-oriented analysis and design. *Prereq. IS U300 and CS U370.*
- IS U477, IS U478, IS U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- IS U535 Information Retrieval 4 SH
Discusses information retrieval including document models, indexing, query techniques, and results evaluation; text analysis for searching, indexing, and compression; user interfaces for text and multimedia retrieval; and digital libraries. Additional topics may include parallel and distributed architectures; support for multimedia and image retrieval; specialized query strategies; and advanced retrieval models. Course work includes using and evaluating existing IR systems as well as implementing small-scale applications that illustrate indexing and retrieval strategies. *Prereq. CS U430.*
- IS U570 Human Computer Interaction 4 SH
Studies the principles of human-computer interaction and the practice of user interface design. Discusses the major human information processing subsystems (perception, memory, attention, and problem solving), and how the properties of these systems influence the design of interactive systems. Reviews guidelines and specification languages for designing user interfaces, with an emphasis on tool kits of standard graphical user interface (GUI) objects. Introduces usability metrics and evaluation methods. Additional topics may include World Wide Web design principles and tools; wireless/mobile device interfaces; computer-supported cooperative work; information visualization; and virtual reality. Course work includes designing user interfaces, creating working prototypes using a GUI tool kit, and evaluating existing interfaces using the methods studied. *Prereq. CS U370.*
- IS U580 Empirical Research Methods 4 SH
Evaluates and conducts empirical research, focusing on students' use of empirical methods to study the effectiveness and organizational/social impact of information systems and technologies. Empirical research involves a number of broad steps including identifying problems; developing specific hypotheses; collecting data relevant to the hypotheses; analyzing the data; and considering alternative explanations for the empirical findings. Some of the most commonly used research techniques, such as surveys, experiments, and ethnographic methods, are discussed. Additional topics include the ethics of data collection and experimentation in behavioral science. Although the course focuses primarily on the relationship between formulating research questions and implementing the appropriate methods to answer them, students can expect to apply the statistical techniques learned in the course prerequisites. *Prereq. IS U470, IS U570, and ECN U350.*
- IS U677, IS U678, IS U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- IS U691 Information Science Field Study 1 SH
Employs the student's cooperative education experience to observe and analyze the real-world interaction between information technology and its context of use. Students identify an aspect of their work environment to study, and make observations that are the basis of an original senior research paper. Course requirements include maintaining a journal of observations and experiences; participating in periodic electronic conferences with fellow students; and communicating regularly with the instructor to discuss the research project and the insights recorded in the journal. *Prereq. IS U580 and IS majors only.*
- IS U692 Information Science Senior Project 5 SH
Helps students develop a sophisticated understanding of the interaction between technology and its context. Students write an in-depth research paper that reflects upon and analyzes the observations and experiences of the field study using the information science literature to interpret and better understand those experiences. Students then participate in a seminar in which they present the results of their research. *Prereq. IS U691 and IS majors only.*
- IS U700 Information Science Thesis 4 SH
Focuses on student preparing an undergraduate thesis under faculty supervision. *Prereq. Junior or senior standing and permission of instructor and undergraduate committee.*
- IS U701 Information Science Thesis Continuation 4 SH
Focuses on student continuing to prepare an undergraduate thesis under faculty supervision. *Prereq. IS U700 and permission of instructor and undergraduate committee.*
- IS U900 Information Science Topics 4 SH
Offers a lecture course in information science on a topic not regularly taught in a formal course. Topics may vary from offering to offering. *Prereq. IS U470 and permission of instructor; may take three times for credit with permission of undergraduate committee.*

IS U910 Information Science Project 4 SH
Focuses on student working on a substantial project in information science under faculty supervision. *Prereq.* 64 SH toward degree and permission of instructor and undergraduate committee; may repeat three times for credit.

IS U921 Directed Study 1 SH
IS U922 Directed Study 2 SH
IS U923 Directed Study 3 SH
IS U924 Directed Study 4 SH
Focuses on student examining standard information science material in fresh ways or new information science material that is not covered in formal courses. *Prereq.* IS U470 and permission of instructor; maximum 12 credits in CS/IS directed study.

IS U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq.* Honors program participation.

IS U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq.* IS U970 and honors program participation.

JOURNALISM

COLLEGE OF ARTS AND SCIENCES

JRN U100 College: An Introduction 1 SH
Intended for first-year students in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

JRN U101 Journalism 1 4 SH
Covers foundations of news writing for print media including leads, story structure, objective tone, and attribution. Introduces fundamental reporting skills such as interviewing, researching, and observation.

JRN U150 Interpreting the Day's News 4 SH
Considers the news of the day and the function of the newspaper, newsmagazine, and news broadcasts in American life. Topics include rights and responsibilities of the press, and how news is gathered, processed, and disseminated by the various media.

JRN U201 Journalism 2 4 SH
Continues JRN U101. This is the second writing course for undergraduate journalism students with an emphasis on learning how to report news stories. Offers students the opportunity to find sources and interview them, do background research, and use public records. Developing story ideas using computer-assisted reporting will be covered. Examines how to develop a story idea and then focus and organize it. Covers basic principles of online journalism including writing, design, and integration of visuals and text for the Web. Introduces elements of design and layout. *Prereq.* JRN U101 with grade of "C" or better.

JRN U277, JRN U278, JRN U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

JRN U301 Journalism 3 4 SH
Continues JRN U201. Covers basic principles of journalistic storytelling with video, sound, and still images. Introduces students to the foundations of writing with audio and video, and explores the concept of "convergence," preparing stories for presentation in different formats. Fulfills the Advanced Writing in the Disciplines requirement for journalism majors. *Prereq.* JRN U201 with grade of "C" or better.

JRN U350 History of Journalism 4 SH
Traces the development of American journalism from its European and English beginnings. Topics include the colonial press, the great personal journalists of the nineteenth century, and the impact of major technological changes in mass communications media in the twentieth century.

JRN U410 Radio News Gathering and Reporting 4 SH
Covers writing and editing news for radio, with practice in interviewing, organizing news scripts, and integrating audio materials into broadcast. *Prereq.* JRN U301.

JRN U425 Public Relations Principles 4 SH
Presents the principles, history, and methods of public relations; processes of influencing public opinion; responsibilities of the public relations practitioner; and analyses of public relations programs. *Prereq.* JRN U301.

JRN U430 Local Reporting 4 SH
Discusses coverage of town/city government, with emphasis on the "beat" approach to reporting public affairs. Focuses on practical, in-the-field experience with town meetings, meetings of boards of selectmen, and other governmental agencies. *Prereq.* JRN U301.

JRN U435 Techniques of Journalism 4 SH
Provides practice in writing in-depth and multiple-source stories requiring significant research. Provides an introduction to investigative reporting, practice in feature writing, and a review of legal issues. *Prereq.* JRN U301.

JRN U440 Editing	4 SH	JRN U606 Beat Reporting	4 SH
Provides practice in copyediting, headline writing, and origination editing. Presents assignments in photo selection, cropping, and cutline writing. Introduces page layout and discusses the principles of online editing. <i>Prereq. JRN U301.</i>		Covers advanced reporting in specific topic areas. Topics change from semester to semester. <i>Prereq. JRN U301.</i>	
JRN U455 Sports Writing	4 SH	JRN U609 Documentary Production	4 SH
Provides practice in journalistic coverage of amateur and professional athletics. Focuses on the role of sports writing in the news media and examines such topics as game coverage, feature profiles, and opinion columns. <i>Prereq. JRN U301.</i>		Provides students with an opportunity to research, write, and produce short video documentaries, and acquaints students with a range of professional documentary work through screenings and discussions. <i>Prereq. JRN U512 or permission of instructor.</i>	
JRN U477, JRN U478, JRN U479	1 SH each	JRN U611 Design and Graphics	4 SH
Honors Adjunct		Introduces graphic design terminology and principles using computer-based desktop publishing programs. Provides students with the opportunity to learn how to plan a publication based on audience and budget. Includes design assignments such as newspapers, magazines, online publications, brochures, advertisements, and corporate identity programs. Emphasizes deadlines and quality of the printed publication. <i>Prereq. JRN U301.</i>	
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>		JRN U625 Public Relations Practice	4 SH
JRN U510 Photojournalism	4 SH	Demonstrates practices and techniques employed in the field including organization of events and functions. Studies campaign planning, research, and media relationships. <i>Prereq. JRN U425.</i>	
Covers camera procedures, cropping techniques, theory, and photo captions. <i>Prereq. JRN U301.</i>		JRN U630 Magazine Writing	4 SH
JRN U511 Television News Writing	4 SH	Covers writing and freelancing magazine articles; analyzing magazines as markets; and selecting the best feature format—how-to-do-it, profile, personal experience, human interest, interpretive pieces, and others. <i>Prereq. JRN U301.</i>	
Covers writing for TV news as opposed to other news media; importance of the writer-reporter as field producer and writer-producer; and terms and language used in the TV news production. <i>Prereq. JRN U301.</i>		JRN U650 Journalism Ethics and Issues	4 SH
JRN U512 Television News Production 1	4 SH	Discusses the responsibilities of news media, ethical problems confronting decision makers in various journalistic fields, and the principles found in codes of various professional societies. Students fulfill the experiential education requirement by writing a ten- to twelve-page paper on an ethical problem they faced while working in the media. <i>Prereq. Senior standing.</i>	
Demonstrates techniques used by the electronic journalist and TV news producer. Provides students the opportunity to build a TV news show and to do reporting with portable TV cameras and editing equipment. <i>Prereq. JRN U511.</i>		JRN U677, JRN U678, JRN U679	1 SH each
JRN U513 Television News Production 2	4 SH	Honors Adjunct	
Continues JRN U512. Provides advanced study of video news-gathering including shooting, interviewing, writing, editing, and field producing. <i>Prereq. JRN U512.</i>		Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	
JRN U514 Newsroom Practices	4 SH	JRN U699 Advanced Television Production	4 SH
Designed to provide graduate and undergraduate journalism students with hands-on experience in creating and producing a newspaper. Students comprise the staff of the <i>NEPA Bulletin</i> , a monthly newspaper published by the New England Press Association and distributed to about 500 newspapers in New England. Students report and write news stories and briefs for the <i>Bulletin</i> ; obtain photos from newspaper sources; on occasion take photos; and, if training in QuarkXpress and Photoshop, design, lay out, and produce the <i>Bulletin</i> . <i>Prereq. JRN U301 or permission of instructor.</i>		Provides students with guidance in the development of special projects in television and video production. Studies include advanced directing (studio and field), lighting, scriptwriting, editing, graphics, and postproduction technology.	
JRN U550 Law of the Press	4 SH	JRN U921 Directed Study	1 SH
Examines legal problems of libel, invasion of privacy, and access to government information; discusses the balance between private rights and the public's "need to know." <i>Prereq. 64 SH toward degree or junior or senior standing.</i>		JRN U922 Directed Study	2 SH
		JRN U923 Directed Study	3 SH
		JRN U924 Directed Study	4 SH

Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

JRN U941 Internship	1 SH
JRN U942 Internship	2 SH
JRN U943 Internship	3 SH
JRN U944 Internship	4 SH

Comprises academic credit for internship work in journalism.

JRN U970 Junior/Senior Project 1	4 SH
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Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

JRN U971 Junior/Senior Project 2	4 SH
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Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. JRN U970 and honors program participation.*

LINGUISTICS

COLLEGE OF ARTS AND SCIENCES

LIN U115 Introduction to Logic	4 SH
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Introduces the logic of propositions and the syllogism. Examines principles of critical reasoning and fallacies. Provides practice in applying logical techniques to the creation and criticism of arguments.

LIN U150 Introduction to Language and Linguistics	4 SH
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Introduces students to their unconscious linguistic knowledge about sentence structure (syntax), meaning (semantics), word forms (morphology), and speech sounds (phonology). Examines other issues related to language such as the black English/standard English debate, women's and men's language, "talking" chimpanzees, "talking" computers, and the nature/nurture controversy.

LIN U215 Symbolic Logic	4 SH
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Focuses on the syntax and semantics of propositional logic and first-order quantification theory. Considers relations between these systems and natural language. Covers analysis of the notion of derivation within a system, the notion of logical consequence, and practice in analyzing logical structure in natural language sentences. Recommended for students with a strong math background. *Prereq. Linguistics major or minors only.*

LIN U277, LIN U278, LIN U279 Honors Adjunct	1 SH each
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Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LIN U350 Linguistic Analysis	4 SH
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Offers a workshop that focuses on the three core areas in the study of language: syntax, morphology, and phonology. Examines the regularities that lie inside each language user's mind, with a slant toward "doing" linguistics: playing with data, analyzing it, and ultimately explaining it. *Prereq. LIN U150 or ENG U150.*

LIN U402 African-American English	4 SH
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Addresses topics in the study of African-American English or Ebonics. Investigates the hypotheses about the origins of African-American English as well as arguments about the relation of the dialect to English and other languages. Considers issues regarding the use of the dialect in schools. *Prereq. LIN U150 or ENG U150 is recommended.*

LIN U412 Language and Culture	4 SH
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Focuses on the anthropological study of linguistics. Presents basic theories of sociolinguistics and explores language in its social context. Includes animal communication; language learning; language and mind; cognitive and symbolic anthropology; the ethnography of speaking, speech, and boundaries; multilingualism; language and gender; language and ethnicity; language and social class; and pidgins and creoles. Includes several field assignments. *Prereq. LIN U150 or ENG U150 is recommended.*

LIN U422 Phonology	4 SH
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Explores the acoustic and articulatory basis of phonology. Emphasizes hands-on experience with standard areas in modern phonology including phonetics, phonetic variation, natural classes of sounds, phoneme alternations, rule systems, and prosodic phonology. Introduces major contemporary theories including autosegmental phonology and feature geometry. *Prereq. LIN U150 or ENG U150 is recommended.*

LIN U428 African Languages	4 SH
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Seeks to prepare students for serious theoretical and practical study of the West African language and literature known as Kwa, the largest language subgroup in the Niger-Congo family. Students explore the classification of African languages, the application of basic linguistics, and the history of these languages in Africa and the Western hemisphere, all leading to an introduction to spoken Yoruba and Igbo. *Prereq. LIN U150 or ENG U150 is recommended.*

LIN U430 Applied Linguistics	4 SH
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Explores the solution of language-based real-world problems. Solutions to these problems depend on information not only from linguistics but also from a variety of other disciplines such as anthropology, sociology, education, ethnic and area studies (including literature), and public administration. Studies the relationship of linguistics to applied linguistics; second language acquisition; second and foreign language teaching; language policy and planning; and the linguistic aspects of multiculturalism. *Prereq. LIN U150 or ENG U150 is recommended.*

- LIN U432 Romance Linguistics 4 SH
Provides a general linguistic introduction to one of the most important language families. Discusses the structural characteristics of several Romance languages. Includes defining a language family, how and why languages change, and the relationship of standard and nonstandard linguistic varieties. Studies contemporary theoretical issues in Romance linguistics including object-pronoun placement, word order, creolization, and subject-pronoun use. Conducted in English. *Prereq. Reading knowledge of one Romance language or permission of instructor; LIN U150 or ENG U150 is recommended.*
- LIN U434 Bilingualism 4 SH
Focuses on the fact that half of the world's population is bilingual, that is, uses two or more languages on a regular basis. Also explores the fact that bilingualism remains a poorly understood phenomenon surrounded by a number of myths: those that hold that bilinguals are found in bilingual countries and are equally fluent in their languages; that bilingual children suffer from cognitive impoverishment; and that bilingual education hinders the assimilation of minority groups. Reviews all aspects of bilingualism (in the world, in society, in the child, and in the adult). Discusses topics such as biculturalism and language change. *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U436 Structure of Spanish 4 SH
Considers the Spanish language from a linguistic point of view, focusing on elements of Spanish phonology (sound system), morphology (word structure), and syntax (sentence structure). Topics include how Spanish compares with other Romance languages, as well as with non-Romance languages like English. *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U438 Structure of French 4 SH
Considers the French language from a linguistic point of view, focusing on elements of French phonology (sound system), morphology (word structure), and syntax (sentence structure). Topics include how French compares with other Romance languages, as well as with non-Romance languages like English. *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U442 Sociolinguistics 4 SH
Focuses on why people choose to say things in different ways in different situations. Examines language behavior in its social context and outlines the linguistic constructs that allow conversation to occur, the types of variation that occurs in registers and dialects, and the possible reasons for choosing different linguistic varieties. Also explores linguistic variation in relation to social context, gender, socioeconomic class, race, and ethnicity. *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U444 Linguistics in Education 4 SH
Explores the role that language plays in education. Topics include the role of language acquisition in psychological development and the implications for formal education; literacy (what does it mean to be literate, how is literacy acquired, and the role that literacy plays in education); the role that language and discourse patterns play in the classroom, in student learning, and in testing; and multilingualism in the classroom. *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U448 Issues in Linguistics 4 SH
Examines topics in linguistics not covered by another course. Sample topics include morphology (word structure), prescriptive/descriptive grammar, field methods in linguistics, and others. *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U450 Syntax 4 SH
Offers an introduction to syntax, the structural rules of a language. Develops and tests syntactic theory, which, like other scientific theories, seeks to explain why things are the way they are. The question underlying the investigation is, How do the structures of language relate to the structure of the human mind? *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U452 Semantics 4 SH
Focuses on meaning and how it is expressed in language—through words, sentence structure, intonation, stress patterns, and speech acts. How do content, logic, and speakers' and listeners' assumptions affect what sentences mean? In what ways is linguistic meaning determined by our perceptual system or our culture? *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U454 History of English 4 SH
Studies the development of modern English from Anglo-Saxon beginnings; effects of Scandinavian and Norman invasions; dialect geography; evolutionary changes, word formation, and borrowing; and origins of writing and problems of spelling. Readings include both formal and informal writings, literary selections, wills, journals, and private and public letters. *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U456 Language and Gender 4 SH
Investigates the relationship between language and gender. Explores how men and women talk; the significant differences and similarities; why men and women talk in these ways; and the social biases in the structure of language itself. A background in linguistics is not required. *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U458 Topics in Linguistics 4 SH
Examines closely one of a range of topics from the perspective of current linguistics: American dialectics, language and law, women's and men's language, words and word structures, or issues in linguistics and literature. *Prereq. LIN U150 or ENG U150 is recommended.*

- LIN U460 ASL Linguistics 4 SH
Introduces the basic issues in linguistics by examining the structural properties of American Sign Language (ASL) and comparing it with other languages having similar properties. Includes phonology (formational properties of signs), morphology (word formation, rules, derivation, inflection, complex verbs, classifiers, and verb modulations), semantics (the meaning structure of signs), and syntax (the structure of ASL utterances in terms of old vs. new information and the structure of ASL narratives). *Prereq. LIN U150 or ENG U150 is recommended.*
- LIN U464 Psychology of Language 4 SH
Provides a basic introduction to psycholinguistics. Topics include the nature and structure of languages, processes involved in the production and comprehension of language, the biological bases of language, and aspects of language acquisition. Examines current theories of language processing and related experimental findings. *Prereq. PSY U101; LIN U150 or ENG U150 is recommended.*
- LIN U466 Cognition 4 SH
Provides a basic introduction to human cognition. Topics include pattern recognition, attention, memory, categorization and concept formation, problem solving, and aspects of cognitive development. Examines current theories of cognitive processing and related experimental findings. *Prereq. PSY U101; LIN U150 or ENG U150 is recommended.*
- LIN U477, LIN U478, LIN U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- LIN U520 Language and the Brain 4 SH
Focuses on language behavior from a neuropsychological viewpoint. Examines models of how the brain controls the production and comprehension of language. Considers localization of cerebral functions and hemispheric lateralization; experimental and clinical evidence for functional models; aphasia, dyslexia, and other language pathologies; and evidence from neuroimaging studies. *Prereq. LIN U464 or PSY U464 and LIN U466 or PSY U466.*
- LIN U522 Psychology of Reading 4 SH
Provides an overview of issues in the psychology of reading. Topics include the nature of the reading process as a perceptual and cognitive activity, eye movement patterns in reading, stages of reading development, and dyslexia. Examines current theories of reading and text comprehension. *Prereq. LIN U464 or PSY U464 and LIN U466 or PSY U466.*
- LIN U524 Language and Cognitive Development 4 SH
Explores language and thought in infancy and childhood, how those processes change with age, and theoretical explanations for those changes. Language topics may include speech perception, word meaning, morphology and syntax, critical period, and language impairments. Cognitive topics may include object perception, memory, categorization, reasoning, problem solving, social cognition, and conceptual change. Emphasis varies by semester. *Prereq. LIN U464 or PSY U464 and LIN U466 or PSY U466.*
- LIN U540 Philosophy of Language 4 SH
Examines prospects for a theory of language, its syntax, and its semantics. Examines contrasts between theory of reference and theory of meaning. Asks whether there are universals of language. Analyzes relations between linguistics and psychology. Includes readings from Frege, Quoin, Russell, Chomsky, and Fodor. *Prereq. PHL U115, LIN U115, LIN U215, and PHL U215.*
- LIN U610 Laboratory in Psycholinguistics 4 SH
Provides students the opportunity to acquire firsthand experience in conducting research on issues in the psychology of language. Focuses on experiments and their implications for broader issues of language processing. Involves students in all aspects of each experiment including collecting and analyzing data and preparing lab reports. *Prereq. PSY U320, LIN U464 or PSY U464, and LIN U466 or PSY U466; linguistics majors or minors only.*
- LIN U612 Laboratory in Cognition 4 SH
Provides students the opportunity to acquire firsthand experience in conducting research on issues in human cognition. Focuses on experiments and their implications for broader issues of cognitive functioning. Involves students in all aspects of each experiment including collecting and analyzing data and preparing lab reports. *Prereq. PSY U320, LIN U464 or PSY U464, and LIN U466 or PSY U466; linguistics majors or minors only.*
- LIN U654 Seminar in Linguistics 4 SH
Explores important topics in language and linguistics, such as style and meaning or language and gender. Emphasizes independent research in a seminar setting. *Prereq. LIN U150 or ENG U150 is recommended; junior or senior standing.*
- LIN U656 Seminar in Linguistics 4 SH
Explores important topics in language and linguistics, such as style and meaning or language and gender. Emphasizes independent research in a seminar setting. *Prereq. LIN U150 or ENG U150 is recommended; junior or senior standing.*
- LIN U658 Seminar in Psycholinguistics 4 SH
Offers intensive study and discussion of issues in the psychology of language. Specific topics vary by semester. *Prereq. PSY U320, LIN U464 or PSY U464, and LIN U466 or PSY U466.*
- LIN U660 Seminar in Cognition 4 SH
Offers intensive study and discussion of issues in cognitive psychology. Specific topics vary by semester. *Prereq. PSY U320, LIN U464 or PSY U464, and LIN U466 or PSY U466.*

LIN U662 Seminar in Linguistics 4 SH
Explores important topics in language and linguistics, such as style and meaning or language and gender. Emphasizes independent research in a seminar setting. *Prereq. LIN U150 or ENG U150 is recommended.*

LIN U677, LIN U678, LIN U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LIN U921 Directed Study 1 SH
LIN U922 Directed Study 2 SH
LIN U923 Directed Study 3 SH
LIN U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

LIN U954 Experiential Education Directed Study 4 SH
Draws upon the student's approved experiential activity and integrates it with study in the academic major. Fulfills the college's experiential education requirement. *Prereq. Permission of instructor.*

LIN U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

LIN U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. LIN U970 and honors program participation.*

MODERN LANGUAGES—ARABIC

COLLEGE OF ARTS AND SCIENCES

LNA U101 Elementary Arabic 1 4 SH
Designed for students with very little or no prior knowledge of Modern Standard Arabic. Provides a lively introduction to basic oral expression, listening comprehension, and elementary reading and writing. Uses practical vocabulary drawn from realistic situations, and aims at good pronunciation and ease in response. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with various audio-visual resources.

LNA U102 Elementary Arabic 2 4 SH
Continues LNA U101. Reviews and continues the study of grammar and basic language skills. Offers progressively more intensive practice in oral and written communication. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with various audio-visual resources. *Prereq. LNA U101, placement test, or permission of instructor.*

LNA U277, LNA U278, LNA U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNA U301 Arabic Conversation and Composition 4 SH
Offers advanced grammar topics with continued stress on aural/oral acquisition. Also comprises some reading of literary texts as well as from the popular media. *Prereq. LNA U102, placement test, or permission of instructor.*

LNA U477, LNA U478, LNA U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNA U677, LNA U678, LNA U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MODERN LANGUAGES—CHINESE

COLLEGE OF ARTS AND SCIENCES

LNC U101 Elementary Chinese 1 4 SH
Designed for students who have very little or no prior knowledge of Chinese. Provides a lively introduction to basic oral expression, listening comprehension, and elementary reading and writing. The audio-lingual approach, using practical vocabulary drawn from realistic situations, aims at good pronunciation and ease in response. Each lesson incorporates helpful information about daily life in China and the varied cultures within the world of Chinese speakers. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources. Focuses on Mandarin Chinese; students who wish to speak another dialect of Chinese should consult instructor for proper placement.

- LNC U102 Elementary Chinese 2 4 SH
Continues LNC 101. Reviews and continues the study of grammar and basic language skills. Offers progressively more intensive practice in oral and written communication. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources. *Prereq.* LNC U101, *placement test, or permission of instructor.*
- LNC U150 Backgrounds of Chinese Culture 4 SH
Introduces students to Chinese culture through the study of a broad array of philosophical, literary and historical texts, and selected plays and films. Conducted in English.
- LNC U255 Chinese Film: Gender and Ethnicity 4 SH
Introduces students to cultural, cross-cultural, intellectual, and social issues that lead them to an informed understanding of Chinese film. Selected films are organized under the topics of gender, ethnicity, and urbanity. Outstanding directors are examined closely to illustrate these topics. Conducted in English.
- LNC U277, LNC U278, LNC U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.
- LNC U301 Chinese Conversation and Composition 1 4 SH
Emphasizes further vocabulary building and mastery of fine points of grammar through written composition, prepared oral reports, and reading and discussion from current Chinese periodicals. Allows students to engage actively in communication within various contexts and reviews the more subtle problems of grammar and writing style. This communicative class is for intermediate or advanced learners. It is especially suitable for Asian-American students who have some knowledge of certain Chinese dialects (that is, Cantonese and a level of language competence equal to two semesters of college Chinese) and want to learn Mandarin Chinese through reading, writing, and discussion. *Prereq.* LNC U102, *placement test, or permission of instructor.*
- LNC U302 Chinese Conversation and Composition 2 4 SH
Continues LNC U301. Emphasizes further vocabulary building and mastery of fine points of grammar through written composition, prepared oral reports, and reading and discussion from current Chinese periodicals. *Prereq.* LNC U301, *placement test, or permission of instructor.*
- LNC U477, LNC U478, LNC U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.
- LNC U501 Advanced Chinese 1 4 SH
Stresses the fundamentals of Chinese to promote effective self-expression through speaking and writing and to explore the idiomatic aspects of the language. Through progressive class discussions and oral and written commentaries, students analyze a contemporary Chinese novel or a Chinese cultural reader, screenplay, or collection of short stories. The course strives, first, to help students read and comprehend modern Chinese writing with confidence and to be able to talk and write about it in good Chinese; and second, to provide preparation for advanced courses. *Prereq.* LNC U302, *placement test, or permission of instructor.*
- LNC U502 Advanced Chinese 2 4 SH
Continues LNC U502. Enhances and reinforces those practical language and communication skills students encounter when they are abroad. *Prereq.* LNC U501, *placement test, or permission of instructor.*
- LNC U677, LNC U678, LNC U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.
- LNC U921 Directed Study 1 SH
LNC U922 Directed Study 2 SH
LNC U923 Directed Study 3 SH
LNC U924 Directed Study 4 SH
Offers students a way of going beyond work given in the regular curriculum; may also enable students to complete major or minor requirements in certain situations. Priority is given to language majors and to juniors and seniors. *Prereq.* Permission of instructor.
- LNC U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq.* Honors program participation.
- LNC U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq.* LNC U970 and honors program participation.

MODERN LANGUAGES—FRENCH

COLLEGE OF ARTS AND SCIENCES

LNF U101 Elementary French 1 4 SH

Designed for students with very little or no prior knowledge of French. Provides a lively introduction to basic oral expression, listening comprehension, and elementary reading and writing. The audio-lingual approach, using practical vocabulary drawn from realistic situations, aims at good pronunciation and ease in response. Each lesson incorporates helpful information about daily life in France and the varied cultures within the world of French speakers. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources.

LNF U102 Elementary French 2 4 SH

Continues LNF U101. Reviews and continues the study of grammar and basic language skills. Offers progressively more intensive practice in oral and written communication. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources. *Prereq.* LNF U101, *placement test, or permission of instructor.*

LNF U111 Elementary French 1—BSIB 4 SH

Designed to meet the special needs of students majoring in international business who have very little or no prior knowledge of French. Provides a lively introduction to basic oral expression, listening comprehension, and elementary reading and writing. The audio-lingual approach, using practical vocabulary drawn from realistic situations, aims at good pronunciation and ease in response. Each lesson incorporates helpful information about daily life in France and the varied cultures within the world of French speakers. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources. *Prereq.* BSIB students only.

LNF U112 Elementary French 2—BSIB 4 SH

Continues LNF U111. Designed for the special needs of international business students. Reviews and continues the study of grammar and basic language skills. Offers progressively more intensive practice in oral and written communication. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources. *Prereq.* LNF U111, *placement test, or permission of instructor; BSIB students only.*

LNF U150 Introduction to French Culture 4 SH

Offers a very broad introduction to French “culture,” by which is meant its principal “high” and “low” versions. An attempt is made to reproduce the knowledge base of a typical well-educated French man or woman. Highlights sports, politics, history,

intellectual history, and the arts. Also addresses questions of cultural relativism. Students write a major paper on a subject chosen in conjunction with the professor.

LNF U277, LNF U278, LNF U279 1 SH each
Honors Adjunct

Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNF U280 French Film and Culture 4 SH

Provides an introduction to some of the qualities that have made French film one of the great national cinemas. Focuses on both form and content; relates outstanding directors' major works to the French culture and society of their period. Conducted in English.

LNF U301 French Conversation and Composition 1 4 SH

Emphasizes further vocabulary building and mastery of fine points of grammar through written composition, prepared oral reports, and reading and discussion from current French periodicals. *Prereq.* LNF U102, *placement test, or permission of instructor.*

LNF U302 French Conversation and Composition 2 4 SH

Continues LNF U301. Stresses the fundamentals of French to promote effective self-expression through speaking and writing and to explore the idiomatic aspects of the language. Through progressive class discussions and oral and written commentaries, students analyze a contemporary French novel or a French cultural reader, screenplay, or collection of short stories. Strives to help students read and comprehend modern French writing with confidence, and to be able to talk and write about it in good French. Provides preparation for advanced courses. *Prereq.* LNF U301, *placement test, or permission of instructor.*

LNF U311 Intermediate French 1—BSIB 4 SH

Designed to meet the special needs of international business students. Emphasizes further vocabulary building and mastery of fine points of grammar through written composition, prepared oral reports, and reading and discussion from current French periodicals. *Prereq.* LNF U112, *placement test, or permission of instructor; BSIB students only.*

LNF U312 Intermediate French 2—BSIB 4 SH

Continues LNF U311. Designed to meet the special needs of international business students. Emphasizes further vocabulary building and mastery of fine points of grammar through written composition, prepared oral reports, and reading and discussion from current French periodicals. *Prereq.* LNF U311 or taken concurrently or placement test or permission of instructor; BSIB students only.

LNF U438 Structure of French 4 SH

Looks at the French language from a linguistic point of view, focusing on elements of French phonology (sound system), morphology (word structure), and syntax (sentence structure).

Topics include how French compares with other Romance languages, as well as with non-Romance languages like English. *Prereq.* LNF U150 or ENG U150.

LNF U477, LNF U478, LNF U479 1 SH each
Honors Adjunct

Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNF U501 Advanced French 4 SH
Completes the students' formal study of French. Comprises advanced grammar, sustained composition, oral reports, and one major writing project in French. *Prereq.* LNF U302, placement test, or permission of instructor.

LNF U511 Advanced French 1—BSIB 4 SH
Designed to meet the special needs of international business students. Stresses the fundamentals of French to promote effective self-expression through speaking and writing and to explore the idiomatic aspects of the language. Through progressive class discussions and oral and written commentaries, students analyze a contemporary French novel or a French cultural reader, screenplay, or collection of short stories. Strives to help students read and comprehend modern French writing with confidence, and to be able to talk and write about it in good French. Provides preparation for advanced courses. *Prereq.* LNF U312, placement test, or permission of instructor; BSIB students only.

LNF U512 Advanced French 2—BSIB 4 SH
Continues LNF U511. Focuses on advanced conversation and composition work for international business students. Is the final language course before students go abroad. Enhances and reinforces those practical language and communication skills that students will encounter when they are abroad. *Prereq.* LNF U511, placement test, or permission of instructor; BSIB students only.

LNF U550 Masterpieces of French Literature 1 4 SH
Introduces the study of French literature. The first part of the course establishes a body of critical practice, and the second part applies that knowledge to selected genres of literature. Conducted in French. *Prereq.* LNF U501.

LNF U551 Masterpieces of French Literature 2 4 SH
Introduces students to a great variety of genres and historical periods, ranging from the tenth to the twenty-first centuries. Since this course is the prerequisite for all upper-class offerings, the techniques and critical theories needed to manage this advanced material are stressed, with frequent written and oral assignments designed to this end. *Prereq.* LNF U501.

LNF U650 French Poetry 4 SH
Provides students with a survey of French poetry through the ages, focusing on representative works of the major French poets. Studies poems in their literary and historical context with an examination of various aspects of French versification. Conducted in French. *Prereq.* LNF U551.

LNF U651 The Splendid Century 4 SH
Presents a study of the Golden Age of French literature in seventeenth-century France, spanning the baroque and classical periods, and evoking the grandeur of the era of Louis XIV and Versailles. Readings cover a rich and diverse body of literature encompassing poetry, theatre, philosophy, the novel, and epistolary writing. The authors studied include Corneille, Racine, Molière, Descartes, Pascal, and La Rochefoucauld. Conducted in French, with English permitted. *Prereq.* LNF U551.

LNF U652 Age of Enlightenment 4 SH
Studies the eighteenth century in France: the Enlightenment. It was an age of challenge to established authority, institutions, and modes of thought. This intellectual and political vitality is reflected in works of Marivaux, Fontenelle, Montesquieu, and Voltaire. It is followed by the awakening of the Romantic sensibility as found in such authors as Diderot, Rousseau, and Bernardin de St. Pierre. Conducted in French, with English permitted. *Prereq.* LNF U551.

LNF U653 Romantic Heritage 4 SH
Treats French Romanticism and its aftermath from a literary and cultural standpoint. Examines Romanticism in poetry and drama, as well as its continuation into the realist novel. Readings include the works of Lamartine, Hugo, Balzac, and Flaubert. Also explores the development of the Parnassian and Symbolist movements. Readings include the works of Baudelaire, Verlaine, Rimbaud, and Mallarmé, precursors of all modern literature. Conducted in French, with English permitted. *Prereq.* LNF U551.

LNF U670 Topics in French 4 SH
Provides in-depth study of a specific topic in French studies. Topic to be chosen each year the course is offered. *Prereq.* LNF U551.

LNF U677, LNF U678, LNF U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNF U700 Capstone Seminar 1 SH
Provides the graduating student the opportunity to integrate the intellectual aspects of the program with its experiential elements, especially the study-abroad portion of the students' program. *Prereq.* LNF U551.

LNF U921 Directed Study 1 SH
LNF U922 Directed Study 2 SH
LNF U923 Directed Study 3 SH
LNF U924 Directed Study 4 SH
Offers students a way of going beyond work given in the regular curriculum; may also enable students to complete major or minor requirements in certain situations. Priority is given to language majors and to juniors and seniors. *Prereq.* Permission of instructor.

LNF U931 Independent Study 1 SH
 LNF U932 Independent Study 2 SH
 LNF U933 Independent Study 3 SH
 LNF U934 Independent Study 4 SH
 Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor.

LNF U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

LNF U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. LNF U970 and honors program participation.*

MODERN LANGUAGES—GERMAN

COLLEGE OF ARTS AND SCIENCES

LNG U101 Elementary German 1 4 SH
 Designed for students with very little or no prior knowledge of German. Provides a lively introduction to basic oral expression, listening comprehension, and elementary reading and writing. The audio-lingual approach, using practical vocabulary drawn from realistic situations, aims at good pronunciation and ease in response. Each lesson incorporates helpful information about daily life in Germany. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources.

LNG U102 Elementary German 2 4 SH
 Continues LNG U101. Includes completion of basic grammatical usage, reading of contemporary German material, and increased stress on oral and aural skills. *Prereq. LNG U101, placement test, or permission of instructor.*

LNG U111 Elementary German 1—BSIB 4 SH
 Designed to meet the special needs of international business students. Designed for students with very little or no prior knowledge of German. Provides a lively introduction to basic oral expression, listening comprehension, and elementary reading and writing. The audio-lingual approach, using practical vocabulary drawn from realistic situations, aims at good pronunciation and ease in response. Each lesson incorporates helpful information about daily life in Germany. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources. *Prereq. BSIB students only.*

LNG U112 Elementary German 2—BSIB 4 SH
 Continues LNG U111. Designed to meet the special needs of international business students. Includes completion of basic grammatical usage, reading of contemporary German material, and increased stress on oral and aural skills. *Prereq. LNG U111, placement test, or permission of instructor; BSIB students only.*

LNG U270 Modern German Film and Literature 4 SH
 Introduces contemporary issues in German culture. Studies the importance of the Faust legend. Considers major novels. Also considers stories and poems by Böll, Grass, Mann, and Brecht as adapted by a new generation of filmmakers— Fassbinder, Schlöndorff, Sanders-Brahms, and Wenders. Conducted in English.

LNG U277, LNG U278, LNG U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNG U301 German Conversation and Composition 4 SH
 Stresses more advanced German to promote effective self-expression through speaking and writing and to explore the idiomatic aspects of the language. Through progressive class discussions and oral and written commentaries, students analyze contemporary German texts. Practice includes watching German films and participating in interviews in German. *Prereq. LNG U102, placement test, or permission of instructor.*

LNG U311 Intermediate German 1—BSIB 4 SH
 Designed to meet the special needs of international business students. Stresses more advanced German to promote effective self-expression through speaking and writing and to explore the idiomatic aspects of the language. Through progressive class discussions and oral and written commentaries, students analyze contemporary German texts. Practice includes watching German films, and participating in interviews in German. *Prereq. LNG U112, placement test, or permission of instructor; BSIB students only.*

LNG U312 Intermediate German 2—BSIB 4 SH
 Continues LNG U311. Designed to meet the special needs of international business students. Provides opportunities to expand vocabulary and develop flexibility in the four basic language skills. Topics include grammar review and continued exposure to modern texts and business language usage. *Prereq. LNG U311 or taken concurrently or placement test or permission of instructor; BSIB students only.*

LNG U477, LNG U478, LNG U479 1 SH each
 Honors Adjunct
 Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNG U511 Advanced German 1—BSIB 4 SH
Designed to meet the special needs of international business students. Strives to develop facility in speaking and writing German and stresses active use of the language. Includes weekly composition assignments and grammar reviews as needed. *Prereq.* LNG U312, placement test, or permission of instructor; BSIB students only.

LNG U512 Advanced German 2—BSIB 4 SH
Continues LNG U511. Offers advanced conversation and composition work for international business students. Is the final language course before students go abroad. Enhances and reinforces those practical language and communication skills students will encounter when they are abroad. *Prereq.* LNG U511, placement test, or permission of instructor; BSIB students only.

LNG U677, LNG U678, LNG U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNG U921 Directed Study 1 SH
LNG U922 Directed Study 2 SH
LNG U923 Directed Study 3 SH
LNG U924 Directed Study 4 SH
Offers students a way of going beyond work given in the regular curriculum; may also enable students to complete major or minor requirements in certain situations. Priority is given to language majors and to juniors and seniors. *Prereq.* Permission of instructor.

LNG U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq.* Honors program participation.

LNG U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq.* LNG U970 and honors program participation.

MODERN LANGUAGES—ITALIAN

COLLEGE OF ARTS AND SCIENCES

LNI U101 Elementary Italian 1 4 SH
Designed for students with very little or no prior knowledge of Italian. Provides a lively introduction to basic oral expression, listening comprehension, and elementary reading and writing. The audio-lingual approach, using practical vocabulary drawn from realistic situations, aims at good pronunciation and ease

in response. Each lesson incorporates helpful information about daily life in Italy and the varied cultures within the world of Italian speakers. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources.

LNI U102 Elementary Italian 2 4 SH
Continues LNI U101. Reviews and continues the study of grammar and basic language skills. Offers progressively more intensive practice in oral and written communication. Laboratory practice complements class work, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources. *Prereq.* LNI U101, placement test, or permission of instructor.

LNI U277, LNI U278, LNI U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNI U301 Italian Conversation and Composition 1 4 SH
Emphasizes further vocabulary building and mastery of fine points of grammar through written composition, prepared oral reports, and reading and discussion from current Italian periodicals. *Prereq.* LNI U102, placement test, or permission of instructor.

LNI U302 Italian Conversation and Composition 2 4 SH
Continues LNI U301. Emphasizes further vocabulary building and mastery of fine points of grammar through written composition, prepared oral reports, and reading and discussion from current Italian periodicals. *Prereq.* LNI U301, placement test, or permission of instructor.

LNI U477, LNI U478, LNI U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNI U501 Advanced Italian 1 4 SH
Stresses the fundamentals of Italian to promote effective self-expression through speaking and writing and to explore the idiomatic aspects of the language. Through progressive class discussions and oral and written commentaries, students analyze a contemporary Italian novel or an Italian cultural reader, screenplay, or collection of short stories. The course strives, first, to help students read and comprehend modern Italian writing with confidence and to be able to talk and write about it in good Italian; and second, to provide preparation for advanced courses. *Prereq.* LNI U302, placement test, or permission of instructor.

LNI U502 Advanced Italian 2 4 SH
Continues LNI U501. Enhances and reinforces those practical language and communication skills that students encounter when they are abroad. *Prereq.* LNI U501, *placement test*, or *permission of instructor*.

LNI U677, LNI U678, LNI U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNI U921 Directed Study 1 SH
LNI U922 Directed Study 2 SH
LNI U923 Directed Study 3 SH
LNI U924 Directed Study 4 SH
Offers students a way of going beyond work given in the regular curriculum; may also enable students to complete major or minor requirements in certain situations. Priority is given to language majors and to juniors and seniors. *Prereq.* Permission of instructor.

LNI U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq.* Honors program participation.

LNI U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq.* LNI U970 and honors program participation.

MODERN LANGUAGES—JAPANESE

COLLEGE OF ARTS AND SCIENCES

LNJ U101 Elementary Japanese 1 4 SH
Introduces basic grammar, sentence patterns, and vocabulary of Japanese with emphasis on spoken Japanese. Includes an introduction to the hiragana and katakana syllabaries in the written component. Designed for students with no previous knowledge of Japanese.

LNJ U102 Elementary Japanese 2 4 SH
Continues LNJ U101. Emphasizes the development of oral skills; secondary emphasis is on reading. Offers students the opportunity to learn basic grammatical patterns, expand vocabulary, and improve communication skills in modern Japanese. Includes the introduction to kanji characters in the written component. *Prereq.* LNJ U101, *placement test*, or *permission of instructor*.

LNJ U150 Introduction to Japanese Pop Culture 4 SH
Provides an introduction to Japanese popular culture through critical analysis of mass media, such as film, television, comics, and animation. Investigates various social and cultural issues, such as gender, family, and education. Films and videos supplement readings. Conducted in English.

LNJ U260 Japanese Film 4 SH
Provides an introduction to Japanese film through works by such great masters as Kurosawa, Mizoguchi, and Ozu, as well as works by new directors from the 1980s and 1990s such as Tami, Morita, and Suo. Studies both form and content; relates major works to Japanese culture. Conducted in English.

LNJ U277, LNJ U278, LNJ U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNJ U301 Japanese Conversation and Composition 4 SH
Provides advanced grammar topics with continued stress on aural/oral acquisition. Offers some reading of literary texts as well as popular media. *Prereq.* LNJ U102, *placement test*, or *permission of instructor*.

LNJ U477, LNJ U478, LNJ U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNJ U677, LNJ U678, LNJ U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNJ U921 Directed Study 1 SH
LNJ U922 Directed Study 2 SH
LNJ U923 Directed Study 3 SH
LNJ U924 Directed Study 4 SH
Offers students a way of going beyond work given in the regular curriculum; may also enable students to complete major or minor requirements in certain situations. Priority is given to language majors and to juniors and seniors. *Prereq.* Permission of instructor.

LNJ U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq.* Honors program participation.

LNJ U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. LNJ U970 and honors program participation.*

MODERN LANGUAGES—LINGUISTICS

COLLEGE OF ARTS AND SCIENCES

LNL U277, LNL U278, LNL U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNL U422 Phonology 4 SH
 Explores the acoustic and articulatory basis of phonology. Emphasizes hands-on experience with standard areas in modern phonology including phonetics, phonetic variation, natural classes of sounds, phoneme alternations, rule systems, and prosodic phonology. Introduces major contemporary theories including autosegmental phonology and feature geometry. *Prereq. LIN U150 or ENG U150.*

LNL U430 Applied Linguistics 4 SH
 Explores the solution of language-based real-world problems. Solutions to these problems depend on information not only from linguistics but also from a variety of other disciplines such as anthropology, sociology, education, ethnic and area studies (including literature), and public administration. Studies the relationship of linguistics to applied linguistics; second language acquisition; second and foreign language teaching; language policy and planning; and the linguistic aspects of multiculturalism. *Prereq. LIN U150 or ENG U150.*

LNL U432 Romance Linguistics 4 SH
 Provides a general linguistic introduction to one of the most important language families. Discusses the structural characteristics of several Romance languages. Includes defining a language family, how and why languages change, and the relationship of standard and nonstandard linguistic varieties. Studies contemporary theoretical issues in Romance linguistics including object-pronoun placement, word order, creolization, and subject-pronoun use. Conducted in English. *Prereq. LIN U150 or ENG U150 and reading knowledge of one Romance language or permission of instructor.*

LNL U434 Bilingualism 4 SH
 Focuses on the fact that half of the world's population is bilingual, that is, uses two or more languages on a regular basis. Also explores the fact that bilingualism remains a poorly understood phenomenon surrounded by a number of myths: those that hold that bilinguals are found in bilingual countries and are equally fluent in their languages; that bilingual children suffer from cognitive impoverishment; and that bilingual education hinders the assimilation of minority groups. Reviews all aspects of bilingualism (in the world, in society, in the child, and in the adult). Discusses topics such as biculturalism and language change. *Prereq. LIN U150 or ENG U150.*

LNL U477, LNL U478, LNL U479 1 SH each
 Honors Adjunct
 Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNL U677, LNL U678, LNL U679 1 SH each
 Honors Adjunct
 Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNL U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

LNL U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. LNL U970 and honors program participation.*

MODERN LANGUAGES—GENERAL

COLLEGE OF ARTS AND SCIENCES

LNM U100 College: An Introduction 1 SH
 Intended for first-year students in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

LNM U250 International Perspectives 4 SH
 Uses major representative works of fiction from the modern European tradition to introduce students to an array of theoretical and critical perspectives (cognitivism, Marxism, formalism, and identity politics). Major authors include Dostoyevsky, Mann, Kafka, Camus, Duras, and Achebe. Team-taught in English by members of the modern language department. Serves as an introduction to literature for language majors, who can get credit in their field of concentration by reading some of the works in the original language.

LNM U277, LNM U278, LNM U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNM U477, LNM U478, LNM U479 1 SH each
 Honors Adjunct
 Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNM U677, LNM U678, LNM U679 1 SH each
 Honors Adjunct
 Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNM U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

LNM U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. LNM U970 and honors program participation.*

MODERN LANGUAGES—RUSSIAN

COLLEGE OF ARTS AND SCIENCES

LNR U101 Elementary Russian 1 4 SH
 Explores the essentials of grammar, practice in pronunciation, acquisition of basic vocabulary, and idiomatic expressions of everyday Russian.

LNR U102 Elementary Russian 2 4 SH
 Continues LNR U101. Studies grammar and spoken and written forms of the language. Covers more advanced features of the language. *Prereq. LNR U101, placement test, or permission of instructor.*

LNR U277, LNR U278, LNR U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNR U285 Russian Civilization 4 SH
 Designed to offer the student a view of Russian culture and civilization; includes guest lectures, films. Conducted in English.

LNR U301 Russian Conversation and Composition 4 SH
 Stresses more advanced Russian to promote effective self-expression through speaking and writing and to explore the idiomatic aspects of the language. Through progressive class discussions and oral and written commentaries, students analyze contemporary Russian texts. *Prereq. LNR U102, placement test, or permission of instructor.*

LNR U385 Russian Literature in Translation 4 SH
 Surveys and analyzes in English the major works of Russian literature of the nineteenth and twentieth centuries, with emphasis on the historical context. Selected writers include Pushkin, Gogol, Turgenev, Dostoyevsky, Tolstoy, and Chekhov. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

LNR U386 History of Soviet Cinema 4 SH
 Surveys the emergence and development of the film industry in the USSR. Examines the political, economic, ideological, and artistic sources of Soviet cinema and their relationship to Russian culture and history. Directors considered include Eisenstein, Vertov, Pudovkin, Dovzhenko, Kozintsev, Kalatozov, and Tarkovsky. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

LNR U477, LNR U478, LNR U479 1 SH each
 Honors Adjunct
 Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

LNR U485 Vienna, Prague, Budapest 4 SH
 Examines the intellectual and cultural history of these three closely linked capitals of Central Europe, their relationship to empires, multinationalism, and the development of modernism before and after World War I. *Prereq. Sophomore standing or above; an introductory history course is strongly recommended.*

LNR U677, LNR U678, LNR U679 1 SH each
 Honors Adjunct
 Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

LNR U921 Directed Study 1 SH
 LNR U922 Directed Study 2 SH
 LNR U923 Directed Study 3 SH
 LNR U924 Directed Study 4 SH
 Offers students a way of going beyond work given in the regular curriculum; may also enable students to complete major or minor requirements in certain situations. Priority is given to language majors and to juniors and seniors. *Prereq.* Permission of instructor.

LNR U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq.* Honors program participation.

LNR U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq.* LNR U970 and honors program participation.

MODERN LANGUAGES—SPANISH

COLLEGE OF ARTS AND SCIENCES

LNS U101 Elementary Spanish 1 4 SH
 Designed for students with little or no knowledge of Spanish. Presents essentials of correct Spanish usage through acquisition of basic skills in reading, speaking, writing, and aural comprehension.

LNS U102 Elementary Spanish 2 4 SH
 Continues LNS U101. Includes completion of basic grammatical usage, reading of contemporary Hispanic material, and increased stress on oral and aural skills. *Prereq.* LNS U101, placement test, or permission of instructor.

LNS U111 Elementary Spanish 1—BSIB 4 SH
 Designed to meet the special needs of international business students. Designed for students with little or no knowledge of Spanish. Presents essentials of correct Spanish usage through acquisition of basic skills in reading, speaking, writing, and aural comprehension. *Prereq.* BSIB students only.

LNS U112 Elementary Spanish 2—BSIB 4 SH
 Continues LNS U111. Designed to meet the special needs of international business students. Includes completion of basic grammatical usage, reading of contemporary Hispanic material, and increased stress on oral and aural skills. *Prereq.* LNS U111, placement test, or permission of instructor; BSIB students only.

LNS U150 Spanish Culture 4 SH
 Examines chronologically the forces that have forged Spanish culture and have made Spain the nation it is today. Traces the development of Spain from the prehistoric caves of Altamira to the present. Observes past and present concerns such as divorce and abortion in a Catholic country, education, the role of women, linguistic diversity, separatism and terrorism, and the incorporation of Spain into the European Community. Incorporates history, sociology, anthropology, geography, economics, and politics. Conducted in English.

LNS U160 Latin American Culture 4 SH
 Introduces students to Latin American culture through the study of a broad array of literary and critical writings by Latin American authors and selected films from Latin America. Authors include Sor Juana, García Márquez, and Jorge Amado. Conducted in English.

LNS U170 Caribbean Literature and Culture 4 SH
 Provides a comparative introduction to the modern literary traditions of the Spanish-, English-, and French-speaking Caribbean. Includes authors such as Carpentier (Cuba), Naipaul (Trinidad), Zobel (Martinique), and Cardenal (Nicaragua). Conducted in English.

LNS U220 Latino, Latin American, and Caribbean Studies 4 SH
 Offers an interdisciplinary introduction to Latinos and people of Latin American and Caribbean origin in the United States as well as to the regions of Latin America and the Caribbean. Dispels a series of powerful myths associated with U.S. Latinos and in Latin American and Caribbean society, such as racial inferiority, poverty, machismo, and violence. Introduces the construction of Latino, Latin American, and Caribbean identities as well as the politics, economics, history, and culture.

LNS U240 Latin American Film 4 SH
 Examines prizewinning Latin American films based on actual events, such as those that occurred during the Argentine military dictatorship of the 1970s, or works of fiction by well-known authors, such as Nobel Prize winner Garcia Marquez. These films ably depict the history and culture of these countries. Conducted in English and the films are in Spanish with English subtitles.

- LNS U250 Cervantes and His Times 4 SH
Introduces students to *Don Quixote de la Mancha*, Cervantes' major work as well as Spain's greatest masterpiece and its supreme gift to Western culture. Studies Cervantes' minor works, *The Exemplary Novels* and *Interludes*. Examines literary, sociological, philosophical, and historical matters: the development of the novel, genre and narratology, role-playing and representation, and Spain's triumphs and defeats. Deals with the Spanish Inquisition and censorship, and examines themes such as madness, truth and lying, and appearance and reality. Conducted in English.
- LNS U265 Spanish Civil War on Film 4 SH
Introduces the Spanish film and provides an understanding of the Spanish Civil War (1936–1939). Uses a semiotic approach; studies images of the Spanish Civil War in photographs and posters to show how fictional and historical texts are transferred to the screen. Examines both documentaries and award-winning feature films by prominent Spanish directors. Demonstrates how the realism of the prominent Spanish directors is combined with surrealist imagery and metaphor to create a distinctive visual style. Conducted in English.
- LNS U277, LNS U278, LNS U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- LNS U301 Spanish Conversation and Composition 1 4 SH
Provides advanced grammar topics and continued stress on aural/oral acquisition. Provides some reading of literary texts as well as of popular media. *Prereq. LNS U102, placement test, or permission of instructor.*
- LNS U302 Spanish Conversation and Composition 2 4 SH
Continues LNS U301. Offers further acquisition of all major skills in Spanish language and increased reading of literary and popular culture texts. Also includes student projects. *Prereq. LNS U301, placement test, or permission of instructor.*
- LNS U311 Intermediate Spanish 1—BSIB 4 SH
Designed to meet the special needs of international business students. Offers advanced grammar topics and continued stress on aural/oral acquisition. Provides some reading of literary texts as well as of popular media. *Prereq. LNS U112, placement test, or permission of instructor; BSIB students only.*
- LNS U312 Intermediate Spanish 2—BSIB 4 SH
Continues LNS U311. Designed to meet the special needs of international business students. Continues acquisition of all major skills in Spanish language. Provides increased reading of literary and popular culture texts. Also includes student projects. *Prereq. LNS U311 or taken concurrently or placement test or permission of instructor; BSIB students only.*
- LNS U436 Structure of Spanish 4 SH
Considers the Spanish language from a linguistic point of view, focusing on elements of Spanish phonology (sound system), morphology (word structure), and syntax (sentence structure). Topics include how Spanish compares to the other Romance languages, and to other non-Romance languages like English. *Prereq. LIN U150 or ENG U150.*
- LNS U477, LNS U478, LNS U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- LNS U501 Advanced Spanish 4 SH
Offers advanced grammar review and expanded student participation. Offers a major project in the language with the possibility of community work in the language. *Prereq. LNS U302, placement test, or permission of instructor.*
- LNS U511 Advanced Spanish 1—BSIB 4 SH
Designed to meet the special needs of international business students. Offers advanced grammar review and expanded student participation. Offers a major project in the language with the possibility of community work in the language. *Prereq. LNS U312, placement test, or permission of instructor; BSIB students only.*
- LNS U512 Advanced Spanish 2—BSIB 4 SH
Continues LNS U511. Offers advanced conversation and composition work for international business students. Is the final language course before students go abroad. Enhances and reinforces those practical language and communication skills students will encounter when they are abroad. *Prereq. LNS U511, placement test, or permission of instructor; BSIB students only.*
- LNS U550 Masterpieces of Spanish Literature
Twelfth–Seventeenth Century 4 SH
Traces the development of Spanish literature from the Middle Ages (las jarchas, El poema del Cid, El libro de buen amor, La Celestina) through the Renaissance and Baroque periods or Golden Age (Garcilaso de la Vega, the picaresque novel, the mystics, Cervantes, Lope de Vega, Calderón). Conducted in Spanish. *Prereq. LNS U501.*
- LNS U551 Masterpieces of Spanish Literature
Eighteenth–Twentieth Century 4 SH
Surveys the literature of eighteenth-, nineteenth-, and twentieth-century Spain. Includes the literary movements of romanticism, realism, and the Generation of '98. Conducted in Spanish. *Prereq. LNS U501.*
- LNS U650 Latin American Literature 4 SH
Offers an overview of the major trends in Latin American literature, from Bernal Diaz through Borges and Vargas Llosa. Studies broad cultural and political contexts, especially the effect of colonization. Conducted in Spanish. *Prereq. LNS U301.*

LNS U651 Spanish Golden Age	4 SH
Examines plays by the outstanding dramatists of the seventeenth century in Spain: Lope de Vega, Calderón de la Barca, Tirso de Molina, Ruiz de Alarcón, and others. Conducted in Spanish. <i>Prereq. LNS U551.</i>	
LNS U670 Spanish Seminar	4 SH
Focuses upon a narrowly defined theme (that is, a single author, a single work, or a single theme), which students are asked to explore in depth; students present a final paper based upon individual research. <i>Prereq. LNS U551 or permission of the instructor.</i>	
LNS U677, LNS U678, LNS U679	1 SH each
Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	
LNS U700 Capstone Seminar	1 SH
Provides the graduating student the opportunity to integrate the intellectual aspects of the program with its experiential elements, especially the study-abroad portion of the student's program. <i>Prereq. LNS U551.</i>	
LNS U921 Directed Study 1	1 SH
LNS U922 Directed Study 2	2 SH
LNS U923 Directed Study 3	3 SH
LNS U924 Directed Study 4	4 SH
Offers students a way of going beyond work given in the regular curriculum; may also enable students to complete major or minor requirements in certain situations. Priority is given to language majors and to juniors and seniors. <i>Prereq. Permission of instructor.</i>	
LNS U931 Independent Study	1 SH
LNS U932 Independent Study	2 SH
LNS U933 Independent Study	3 SH
LNS U934 Independent Study	4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor.	
LNS U970 Junior/Senior Project 1	4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i>	
LNS U971 Junior/Senior Project 2	4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. LNS U970 and honors program participation.</i>	

MECHANICAL ENGINEERING TECHNOLOGY

SCHOOL OF ENGINEERING TECHNOLOGY

MET U201 Statics	4 SH
Examines the behavior of forces, moments, couples, and statics of particles, and of rigid bodies in two- and three-dimensional space. Topics include external and internal distributed forces, moments of inertia, and centroids. Provides methods to analyze structures including trusses, frames, and machines. <i>Coreq. MET U202. Prereq. MTH U110.</i>	
MET U202 Lab for MET U201	0 SH
Accompanies MET U201. Covers topics from the course through various experiments. <i>Coreq. MET U201.</i>	
MET U277, MET U278, MET U279	1 SH each
Honors Adjunct Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	
MET U301 Dynamics	4 SH
Explores forces as they relate to motion including velocity, acceleration, and friction. Also explores kinematics of particles and rigid bodies. Studies the impulse and momentum of particles. <i>Coreq. MET U302. Prereq. MET U201.</i>	
MET U302 Lab for MET U301	0 SH
Accompanies MET U301. Covers topics from the course through various experiments. <i>Coreq. MET U301.</i>	
MET U311 Stress Analysis	4 SH
Examines columns and beams determining stress and strain; factors of safety; and temperature effects for determinate and indeterminate members. Other topics include shear and moment diagrams, flexural and transverse shearing stresses, torsional stress, and deformations.	
MET U321 Thermodynamics	4 SH
Introduces the general theory of heat and matter. Discusses the first and second law of thermodynamics for open and closed systems. Applications include nozzles, compressors, heat exchangers, turbines, and internal combustion engines. Topics include energy-transformation principles, availability of energy, and properties and processes for pure substances, liquids, and ideal gases. Also covers thermodynamics properties using tables and charts, mixture of fluids, vapor cycles, power cycles, and refrigeration cycles. <i>Coreq. MET U322. Prereq. CHM U151.</i>	
MET U322 Lab for MET U321	0 SH
Accompanies MET U321. Covers topics from the course through various experiments. <i>Coreq. MET U321.</i>	

MET U341 Materials	4 SH	MET U414 Mechanical Vibrations	4 SH
Identifies methods of selection of materials for engineering applications. Topics include fundamental metallic, ceramic, and polymer structures. Additional topics include testing materials, and alloying and hardening of metals. Discusses fabrication methods including powder metallurgy, metalworking, casting, molding, machining, and welding. Laboratory experiments include the preparation of samples, microstructure analysis, cooling curves, and binary phase diagrams. <i>Coreq. MET U342. Prereq. MET U201.</i>		Studies the elements of vibrating systems, one degree of freedom, natural frequencies, and damped free and forced vibration. Presents design of vibration absorbers for industrial equipment. <i>Coreq. MET U415. Prereq. MET U301.</i>	
MET U342 Lab for MET U341	0 SH	MET U415 Lab for MET U414	0 SH
Accompanies MET U341. Covers topics from the course through various experiments. <i>Coreq. MET U341.</i>		Accompanies MET U414. Covers topics from the course through various experiments. <i>Coreq. MET U414.</i>	
MET U351 Measurement and Analysis	4 SH	MET U444 Power Generation	4 SH
Introduces students to mechanical measurements, instrumentation, and experiment data. The principles developed in class are applied in the laboratory, and technical report writing is required. Team-based laboratory experiments utilize statistical techniques in mechanical measurements of temperature, pressure, force, deformation, strain, and rotational frequency. <i>Coreq. MET U352. Prereq. MET U201 and MTH U142.</i>		Explores electrical power generation by thermo-mechanical, electromechanical, nuclear, and hydraulic systems. Emphasizes the analysis of thermodynamic cycles as well as the practical deviations from related ideal processes. Considers accessory and auxiliary equipment used in such systems. Studies design, performance, economic factors, and public issues affecting electric power generation. <i>Coreq. MET U445. Prereq. MET U321.</i>	
MET U352 Lab for MET U351	0 SH	MET U445 Lab for MET U444	0 SH
Accompanies MET U351. Covers topics from the course through various experiments. <i>Coreq. MET U351.</i>		Accompanies MET U444. Covers topics from the course through various experiments. <i>Coreq. MET U444.</i>	
MET U364 Kinematics	4 SH	MET U477, MET U478, MET U479	1 SH each
Presents the principles of kinematics through manual and computer methods to analyze and design mechanisms. Topics include four-bar linkage, slider cranks, cams and followers, and gears and rear trains (reverted and epicyclic). <i>Coreq. MET U365. Prereq. GET U131.</i>		Honors Adjunct	
MET U365 Lab for MET U364	0 SH	Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	
Accompanies MET U364. Covers topics from the course through various experiments. <i>Coreq. MET U364.</i>		MET U480 Topics in Mechanical Engineering Technology	4 SH
MET U385 Pro/Engineer	4 SH	Conducts experimental and/or theoretical work under individual faculty supervision. <i>Coreq. MET U481. Prereq. Permission of faculty adviser.</i>	
Introduces the use of Pro/Engineer to build parametric three-dimensional models of parts and assemblies and to make drawings of them. Stresses fundamental skills and concepts central to the successful use of Pro/Engineer in a production environment. Topics include creating objects; creating features such as straight/revolved/swept protrusions, holes, cuts, chamfers, and rounds; datum and sketching tools; patterns; advanced modeling utilities; assembly fundamentals, and detail drawings. Students gain an understanding of the design philosophy of Pro/Engineer through this extensive hands-on course with numerous practice exercises. <i>Coreq. MET U386. Prereq. GET U331.</i>		MET U481 Lab for MET U480	0 SH
MET U386 Lab for MET U385	0 SH	Accompanies MET U480. Covers topics from the course through various experiments. <i>Coreq. MET U480.</i>	
Accompanies MET U385. Covers topics from the course through various experiments. <i>Coreq. MET U385.</i>		MET U482 Applied Metallurgy	4 SH
MET U482 Applied Metallurgy	4 SH	Examines mechanical properties of ferrous metals, the iron carbon diagram, high-temperature alloys, hardening methods, impact tests, and the effects of environment. Also discusses manufacturing processes and methods of fabrication. <i>Coreq. MET U483. Prereq. MET U341.</i>	
MET U483 Lab for MET U482	0 SH	MET U483 Lab for MET U482	0 SH
Accompanies MET U482. Covers topics from the course through various experiments. <i>Coreq. MET U482.</i>		Accompanies MET U482. Covers topics from the course through various experiments. <i>Coreq. MET U482.</i>	
MET U521 Heat Transfer	4 SH	MET U521 Heat Transfer	4 SH
Presents the principles of heat transfer, thermal convection, conductance, and resistances. Includes emissivity, absorptivity, and heat exchanger design and selection. <i>Coreq. MET U522. Prereq. MET U321.</i>		Presents the principles of heat transfer, thermal convection, conductance, and resistances. Includes emissivity, absorptivity, and heat exchanger design and selection. <i>Coreq. MET U522. Prereq. MET U321.</i>	

MET U522 Lab for MET U521	0 SH	MET U631 Hybrid Vehicles Technology and Design	4 SH
Accompanies MET U521. Covers topics from the course through various experiments. <i>Coreq. MET U521.</i>		Imparts the science and technology of electric vehicles (EV) and hybrid electric vehicles (HEV). Covers the mechanics, power, and propulsion of vehicles for terrestrial transportation. Discusses fundamentals and design of batteries, fuel cells and DC machines, three-phase AC machines, induction machines, regenerative braking, permanent magnet machines, and switched reluctance machines. Also studies electric drive components, the EV transmission configuration, and EV motor sizing. Students are required to complete a design project relative to EV and/or HEV design. <i>Prereq. MET U321, MET U351, and MET U521.</i>	
MET U526 Heating, Ventilation, and Air Conditioning	4 SH	MET U651 Mechanical Design	4 SH
Introduces air-conditioning principles, including psychometrics and heat pumps. Topics include calculation of heating and cooling loads in accordance with ASHRAE practices; principles of gas compression; analysis of vapor compression; refrigeration systems; low-temperature refrigeration cycles; and absorption refrigeration systems. <i>Coreq. MET U527. Prereq. MET U321.</i>		Introduces the principles of mechanical design, the design process, design factors, creativity, optimization, and value engineering. Examines properties and selection of materials, stress concentration, combined stress, theory of failure, impact, and fluctuating and repeated loads. Design methodology is applied to products, processes, and equipment. Further study includes design of fasteners, screws, joints, springs, bearings, and gears. <i>Coreq. MET U652. Prereq. MET U311, MET U341, and MET U531.</i>	
MET U527 Lab for MET U526	0 SH	MET U652 Lab for MET U651	0 SH
Accompanies MET U526. Covers topics from the course through various experiments. <i>Coreq. MET U526.</i>		Accompanies MET U651. Covers topics from the course through various experiments. <i>Coreq. MET U651.</i>	
MET U531 Fluid Mechanics	4 SH	MET U677, MET U678, MET U679	1 SH each
Studies the principles of fluid statics and dynamics. Topics include fluid flow in pipe, friction losses, fluid energy, Bernoulli theorem, open channel flow, and pump and fan design. The fluid laboratory examines incompressible fluids. <i>Coreq. MET U532. Prereq. MET U301.</i>		Honors Adjunct	
MET U532 Lab for MET U531	0 SH	Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	
Accompanies MET U531. Covers topics from the course through various experiments. <i>Coreq. MET U531.</i>		MET U921 Directed Study	1 SH
MET U551 Manufacturing Methods	4 SH	MET U922 Directed Study	2 SH
Introduces the study of machines for metal processing, cutting tools, and fluids, machinability, and automatic machinery. <i>Coreq. MET U552. Prereq. MET U341.</i>		MET U923 Directed Study	3 SH
MET U552 Lab for MET U551	0 SH	MET U924 Directed Study	4 SH
Accompanies MET U551. Covers topics from the course through various experiments. <i>Coreq. MET U551.</i>		Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i>	
MET U556 Fuel Cells: Principles and Technologies	4 SH	MET U970 Junior/Senior Project 1	4 SH
Examines the underlying thermodynamics and electrochemical principles of energy conversion through fuel cells including oxidation, free energy, and standard potential of the cell. Covers system, elements, and performance characteristics, polarization, and voltage output. Studies regenerative fuel cells and dissociation. Presents the classification of fuel cells and its applications. Special emphasis is given to the study of hydrogen fuel cells. Discusses recent technologic innovations and applications of fuel cells in transportation vehicles, biomedicine, and industrial and domestic power generation. Discusses technologic issues of fuel cells, and presents trends, forecasts, and impact of this technology in areas of energy generation, conservation, and the environment. Students are required to complete a design project. <i>Coreq. MET U557. Prereq. PHY U141 and MET U321.</i>		Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i>	
MET U557 Lab for MET U556	0 SH	MET U971 Junior/Senior Project 2	4 SH
Accompanies MET U556. Covers topics from the course through various experiments. <i>Coreq. MET U556.</i>		Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. MET U970 and honors program participation.</i>	

MANAGEMENT

COLLEGE OF BUSINESS ADMINISTRATION

MGT U277, MGT U278, MGT U279 1 SH each
Honors Adjunct

Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor.

Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MGT U301 Legal, Ethical, and Social Issues 4 SH

Focuses on the legal, ethical, social, and economic influences as well as domestic and international cultural factors that affect business. Provides students with a general understanding of the many complexities involved with ethical decision making in the business arena. Enables students to develop a better understanding of moral philosophies and how they apply to business. Topics include the foundations of personal and managerial ethics; the business, government, and society interrelationships; the development of corporate codes of ethics; and the pressures of special interest groups. Also exposes students to government regulations and legal scenarios that apply to management. *Prereq. 64 SH toward degree.*

MGT U304 Business Law and Professional Ethics 4 SH

Covers business law, professional code of conduct, and the importance of ethical behavior in today's business environment. Examines legal aspects of commercial transactions and business relationships. Specifically, laws relating to contracts and sale of goods under the Uniform Commercial Code, agency law, and product liability law are discussed. *Prereq. ACC U301; for ACC concentrators only.*

MGT U320 Negotiation 4 SH

Focuses attention on the strategies and techniques employed in the negotiations process. Includes familiarization with related literature, student role-play, and interaction with professionals involved in private and public sector negotiations. *Prereq. 64 SH toward degree.*

MGT U410 Legal Aspects of Business 4 SH

Examines the legal aspects of business transactions and business relationships involving contracts and sale of goods under the Uniform Commercial Code, as well as product liability and agency law. *Prereq. 64 SH toward degree.*

MGT U477, MGT U478, MGT U479 1 SH each
Honors Adjunct

Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor.

Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MGT U501 Strategy in Action 4 SH

Provides for the integration and application of administrative theory, knowledge, skills, and experiences for effective strategic performance in an organization. Enables students to acquire a better understanding of the relevance and limitations of

business and management concepts and techniques when making and implementing strategic decisions. *Prereq. Senior standing; CBA students only.*

MGT U510 Advanced Strategic Management 4 SH

Emphasizes the systems designed by managers to facilitate organizational change and effective strategy implementation. Develops a framework for understanding and managing the complex interrelationships that exist among strategy, structure, culture, control systems, and management style, and their impact on the organization's performance, through readings and case discussions. Explores current strategic management issues such as global expansion, corporate renewal, quality assurance, innovation and technology, strategic alliances, project management, and functional perspectives integration, through discussion of current and classic strategic management writings. *Prereq. MGT U501 or taken concurrently and senior standing.*

MGT U602 Managing in a Digital Economy 4 SH

Examines the legal aspects of business transactions and business relationships involving contracts and sale of goods under the Uniform Commercial Code, as well as product liability and agency law. The course is the honors equivalent of MGT U410. *Prereq. Honors program participation.*

MGT U604 Managing Legal Liabilities: High Tech 4 SH

Focuses on the legal liabilities of a (fictitious) small biotechnology company intent on developing therapies to inhibit the growth and metastases of cancerous tumors. Many rapidly growing companies in novel industries discover they are subject to unforeseen legal and environmental forces. Managing the risks and legal liabilities for these organizations is made difficult since specific case law may be only emerging in the courts. As this case-based course progresses, we follow the company as it faces numerous potential legal and ethical hurdles. Includes guest appearances from corporate, government, and nongovernment legal, scientific, and managerial personnel. *Prereq. Honors program participation.*

MGT U606 Cross-Cultural Management through Literature 4 SH

Focuses on helping students develop skills in cross-cultural management using recent articles from business journals as well as short stories from authors around the world. Discusses these stories using the management articles as an analytical framework. Topics include culture shock, repatriation, the meaning of work and personal values, power and authority, status and hierarchy, ethics, and change. *Prereq. Honors program participation.*

MGT U608 Integrating Academics and Co-op 4 SH

Draws upon cases, case research, library research, field research, and interviewing experts in the field to build a framework for implementing an interdisciplinary curriculum. Student teams conduct library and field research at local universities to identify factors that contribute to or inhibit the implementation of an interdisciplinary curriculum. Factors analyzed include framework, leadership, technology, global, and communications. *Prereq. Honors program participation.*

MGT U677, MGT U678, MGT U679 1 SH each
 Honors Adjunct
 Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MGT U921 Directed Study 1 SH
 MGT U922 Directed Study 2 SH
 MGT U923 Directed Study 3 SH
 MGT U924 Directed Study 4 SH

Allows students who have received approval to undertake independent study in lieu of any course required in the various concentrations. Students present proposals to an Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study takes place. A copy of the final report prepared by the student is presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from concentration coordinators. *Prereq. Permission of instructor.*

MGT U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

MGT U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. MGT U970 and honors program participation.*

MECHANICAL, INDUSTRIAL, AND MANUFACTURING ENGINEERING

COLLEGE OF ENGINEERING

MIM U277, MIM U278, MIM U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MIM U300 Introduction to Engineering Co-op Education 1 SH
 Provides students preparation for the first co-op experience. Focuses on skills that provide a basis for successful co-op engagement including expectations and requirements, an introduction to professional credentials, résumé construction,

self-assessment and goal setting, interviewing, professional and co-op ethics, issues of diversity in the workplace community, academic planning and decision making, and an introduction to career portfolios. *Prereq. GE U100.*

MIM U310 Introduction to Industrial Engineering 4 SH
 Provides an overview of the history of industrial engineering and of the most common methods that industrial engineers use to solve problems and design efficient processes. The emphasis is on how these methods are used to study, improve, and/or optimize a product or process. Topics include work design, ergonomic design, engineering statistics, quality engineering, engineering economics, project management, and process optimization. Also discusses the design of the production processes, facilities, and material handling systems. Studies applications in manufacturing, product design, and service industries. Laboratory experiments and written reports are required. *Prereq. MTH U241.*

MIM U315 Statistical and Economic Analyses in Engineering 4 SH
 Introduces engineering probability and statistics, as well as engineering economic analysis for project or design evaluation. Case studies are used to illustrate the integration of these areas in the design/system analysis process. Topics in engineering probability and statistics include descriptive statistics, expected value of random variables, and hypotheses testing. Introduces statistical process control and sampling methods as well as reliability methods for the analysis and improvement of system/design performance. Also covers fundamental concepts of time value of money and economic valuation of system designs. Effect of depreciation and taxes on comparing different alternatives is studied. Project management topics and optimization software applications are introduced. Provides students with evaluation tools for analyzing the design/manufacturing process. *Prereq. MTH U242.*

MIM U340 Introduction to Materials Science 4 SH
 Introduces the materials science field, which emphasizes the structure-processing property-performance relationships for various classes of materials including metals, ceramics, polymers, electronic materials, and magnetic materials. Topics include crystallography, structure of solids, imperfections in crystals, mechanical properties, dislocation theory, slip, strengthening mechanisms, phase equilibrium, phase transformations, diffusion, thermal and optical physical properties, and electrical and magnetic properties. Issues associated with materials selection, including economic and environmental consequences of materials choices, are also addressed. Laboratory experiments, with written memo and report submissions, are required. Includes individual and team-based projects. *Coreq. MIM U341. Prereq. CHM U151.*

MIM U341 Lab for MIM U340 1 SH
 Accompanies MIM U340. Covers topics from the course through various activities. *Coreq. MIM U340.*

MIM U350 Engineering Mechanics and Design 4 SH
 Introduces the vector representation of force and moment, the equivalent force systems, free body diagrams, and equations of equilibrium. Discusses centroids and center of gravity of rigid bodies. Applications to beams, trusses, and pin-connected frames and elementary concepts of friction are examined. The kinematics of particles and kinetics of particles are treated using force mass and acceleration. Energy and momentum methods for particles are also covered. Includes a design project that demonstrates the fundamental concepts of equilibrium. *Prereq. PHY U151 and MTH U242.*

MIM U355 Mechanics of Materials 4 SH
 Discusses concepts of stress and strain; transformation of stress and strain at a point; stress-strain relations material properties; second moments of cross-sectional areas; stresses and deformations in simple structural members due to axial, torsional, and flexural loading for statically determinate and indeterminate cases; design of beams under combined loading; and stability of structures and buckling of columns with various supports. Laboratory experiments and written reports are required. *Coreq. MIM U356. Prereq. MIM U350.*

MIM U356 Lab for MIM U355 1 SH
 Accompanies MIM U355. Covers topics from the course through various activities. *Coreq. MIM U355. Prereq. MIM U350.*

MIM U380 Thermodynamics 4 SH
 Defines and calculates thermodynamic properties such as energy, entropy, temperature, and pressure. Work and heat interactions are defined. The first and second laws of thermodynamics and concepts of thermodynamic equilibrium are introduced. Conservation of energy and mass and the entropy balance relation are discussed for open and closed systems. Irreversibility, energy, and the energy balance relation are introduced and applied in analyzing thermodynamic systems. Fundamentals of thermodynamics are used to model power generation and refrigeration systems. Covers thermodynamics of nonreacting gas mixtures with applications to air-water vapor mixtures for air-conditioning systems. *Prereq. MTH U341 and PHY U151.*

MIM U412 Engineering Probability and Statistics 4 SH
 Presents probability theory axiomatically, with emphasis on sample space presentation of continuous and discrete random variables. Covers descriptive statistics, expected value of random variables, covariance and correlation, sampling distribution, and point and interval estimations. Introduces hypothesis testing including tests for means, variances, and proportions. *Prereq. MTH U242.*

MIM U420 Computers and Information Systems 4 SH
 Examines the design and implementation of computer-based information systems. Presents the techniques of the development life cycle of these systems. Introduces the students to available Web tools that are relevant to the use, design, development, and implementation of information systems in the context of the Internet and World Wide Web. Emphasizes the

use and applications of information systems in engineering including design and manufacturing. Topics include the value of information; information and decision making; tools of system analysis and design; basic and advanced HTML; and JavaScript. *Prereq. GE U111.*

MIM U425 Engineering Database Systems 4 SH
 Examines the representation of data and its creation and management in engineering enterprises. Discusses the client/server model of database access. Presents the fundamentals of data modeling and management, data mining and warehousing, multitier applications, and the use of the SQL query language. Emphasizes the use and applications of database systems in engineering including design and manufacturing. Topics include design schema of tables, records and fields of databases, SQL statements, security issues, and the use of a scripting language such as Perl or Visual Basic. *Prereq. GE U111.*

MIM U430 Object-Oriented Engineering Applications 4 SH
 Examines the object-oriented programming (OOP) paradigm and its use in engineering applications, computations, and problem solving. Presents object-oriented concepts that are used to build these applications. Covers the basics of Java and how to use it in object-oriented engineering programming. Topics include objects, Java programs, GUIs, client/server engineering applications, database access, and problem solving. *Prereq. GE U111.*

MIM U455 Dynamics and Vibrations 4 SH
 Covers kinematics of rigid bodies in general plane motion and mass moments of inertia. Examines kinetics of rigid bodies using force-mass-acceleration, work and energy, and impulse and momentum. Explores continued development of problem-solving ability in dynamics, free and forced vibration of undamped and damped on-degree-of-freedom systems. Topics include viscous and nonviscous damping, support motion, rotational unbalance, vibration isolation, vibration measuring instruments, general periodic excitation, and general excitation using numerical methods. Laboratory experiments and written reports are required. *Coreq. MIM U456. Prereq. MIM U350.*

MIM U456 Lab for MIM U455 1 SH
 Accompanies MIM U455. Covers topics from the course through various activities. *Coreq. MIM U455.*

MIM U475 Fluid Mechanics 4 SH
 Studies fundamental principles in fluid mechanics. Topics include hydrostatics (pressure distribution, forces on submerged surfaces and buoyancy); Newton's law of viscosity; dimensional analysis; integral forms of basic laws (conservation of mass, momentum, and energy); pipe flow analysis; differential formulation of basic laws including Navier-Stokes equations; and the concept of boundary layer and drag coefficient. Includes a team-based independent project. *Prereq. MTH U341 and MIM U350.*

MIM U477, MIM U478, MIM U479 Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each	MIM U510 Digital Simulation Techniques Covers model design and development, verification, validation, and experimentation for discrete event simulation models. Topics include problem formulation, data collection and analysis, random variable generation, and statistical analysis of output. Advanced topics include numerical methods such as tests for independence, randomness, homogeneity, uniformity, and analysis of theoretical distributions. Utilizes a major simulation language such as SIMAN, GPSS, or SIMSCRIPT. <i>Prereq. Junior or senior standing or permission of instructor.</i>	4 SH
MIM U500 Professional Issues in Engineering Provides students with an opportunity to reflect on both academic and co-op experiences in the context of planning for the senior year and beyond. Issues include professional and ethical issues; resolving ethical conflicts; awareness of engineers as professionals in a diverse world; strengthening decision-making skills; career portfolios; and lifelong learning needs, goals, and strategies. Students reflect upon issues of diversity from their experiences in the University and in their cooperative education placements. Explores the role of different work and learning styles and diverse personal characteristics on the workplace and the classroom. Professional issues include impact of the cultural context, both in the United States and around the world, of the client, government relations, and workplace. <i>Prereq. Junior or senior standing</i>	1 SH	MIM U512 Engineering Economy Introduces students to economic modeling and analysis techniques for selecting alternatives from potential solutions to an engineering problem. Presents basic methods of economic comparison such as present worth, annual worth, rate of return, and benefit/cost techniques. Studies effects of taxes on investment analysis. Also covers decisions tree analysis and statistical decision techniques. <i>Prereq. MIM U412.</i>	4 SH
MIM U505 Measurement and Analysis with Thermal Science Application Introduces students to basic measurements and data analysis techniques. Students become familiar with various types of measurement systems and set up and perform experiments according to a given procedure. Topics include basic measurement methods of rotational frequency, temperature, pressure and power, and A/D conversion techniques and data acquisition. Data analysis topics include statistical analysis of data, probability and inherent uncertainty, basic measurement techniques, primary and secondary standards, system response characteristics, and computerized data acquisition methods. Includes experiments in thermodynamics, fluid mechanics, and heat transfer. Topics include cycle performance, flow discharge coefficient and heat transfer coefficient measurements, and psychrometric applications in the air-conditioning field. A team-based project to design and conduct an experiment and several professional-quality written reports are required. <i>Coreq. MIM U506. Prereq. MIM U315 and MIM U380.</i>	4 SH	MIM U515 Operations Research Introduces deterministic models including linear programming, duality and post-optimality analysis, transportation and assignment problems, network flows such as shortest path, minimum spanning tree, maximum flow, and dynamic programming models and applications. <i>Prereq. MTH U343.</i>	4 SH
MIM U506 Lab for MIM U505 Accompanies MIM U505. Covers topics from the course through various activities. <i>Coreq. MIM U505.</i>	1 SH	MIM U516 Quality Assurance Reviews the distributions and statistical approximations commonly applied in statistical quality control methods. Introduces analysis of variance and simple linear regression. Covers basic principles to state-of-the-art concepts and application of statistical process control and design. Applies principles to a variety of products. Topics include product quality measures and controls, Shewhart control charts, quality cost, Pareto analysis, discrete and variable sampling, and military standards in quality control. <i>Prereq. MIM U412.</i>	4 SH
MIM U508 Mechanical Engineering Computation and Design Highlights the role of finite element analysis in product development. Introduces the theory of finite elements in elastic/plastic, static, and transient problems. Emphasis is on solid modeling in design using available commercial finite element software. Also covers other numerical techniques such as finite difference schemes in the solution of systems of partial differential equations, and numerical solution to systems of linear and nonlinear equations. <i>Prereq. MIM U355 and MTH U343.</i>	4 SH	MIM U520 Stochastic Modeling Covers analytical development and solution to stochastic models in operations research. Topics include Markov chains, queuing theory, inventory models and forecasting using linear regression, method of least squares, and confidence interval estimation. <i>Prereq. MIM U412.</i>	4 SH
		MIM U522 Human Machine Systems Emphasizes human sensory/motor performance, information processing capabilities, learning, memory, and skilled-task performance. Topics include an introduction to the experiment as a source of knowledge of human performance characteristics; vision, visual performance, visual display design; audition, noise, hearing damage, auditory signals; principles of somesthesia; information processing; signal detection; aging effects; and system development. Environments and equipment are subjected to usability tests that take into account principles of human-computer interaction and human anthropometric characteristics. Laboratory experiences include experimental design, data collection and analysis, and laboratory reports generation. <i>Coreq. MIM U523. Prereq. MIM U412.</i>	4 SH

MIM U523 Lab for MIM U522 Accompanies MIM U522. Covers topics from the course through various activities. <i>Coreq. MIM U522.</i>	1 SH	MIM U570 Thermal Systems Analysis and Design Introduces theories of thermal energy transport, including conduction, convection, and thermal radiation, and the design of thermal systems. Solution methods are developed for steady-state and transient conduction problems including thermal circuit analogies, internal energy sources, and extended surfaces. Convective heat transfer mechanisms are introduced and correlations to evaluate the heat transfer coefficient are discussed. Methodologies for calculating the thermal radiation heat transfer between surfaces are introduced. These theories are integrated with thermodynamics and fluid mechanics in the design of thermal systems including heat exchangers. Includes an open-ended design project and students are expected to use computational methods throughout the course. <i>Prereq. MIM U380, MIM U475, and MIM U508.</i>	4 SH
MIM U525 Logistics and Supply Chain Management Introduces students to the analysis, design, control, and operation of logistics and supply chain management systems. Includes the integration of supply chain components, logistics information systems, production scheduling, inventory management, transportation, and warehousing and facility location planning. <i>Prereq. MIM U412 and MIM U515.</i>	4 SH	MIM U615 Expert Systems Introduces students to the theory, topics, and applications of expert systems in engineering. Topics include knowledge representation formats (production rules, frames, networks, and logic systems), heuristics in engineering (deterministic and nondeterministic), fuzzy logic, certainty factors, cognition, memory, decision strategies, design of expert systems, shells machine learning techniques, current research goals, and applications in engineering. Each student must complete a design project in expert systems development and/or application. <i>Prereq. MIM U412 and GE U111.</i>	4 SH
MIM U530 Manufacturing Systems and Techniques Focuses on manufacturing and design and their impact on each other. Covers the basics of design-manufacturing integration, manufacturing systems, manufacturing processes and techniques, manufacturing automation, and production planning and control. Topics include concurrent engineering, design for assembly, design for manufacturability, rapid prototyping, mechanical tolerancing, bill of materials, group technology, computer-aided process planning, NC part programming, programmable logic controllers, flexible manufacturing systems, computer-integrated manufacturing, and just-in-time philosophy. Topics also include traditional manufacturing processes such as casting, forming, machining, welding, molding, and particulate processing, and nontraditional manufacturing processes such as electrical discharge machining, laser machining, and water jet machining. Students are required to conduct manufacturing-related experiments in the manufacturing lab to gain hands-on experience. <i>Coreq. MIM U531. Prereq. Junior or senior standing.</i>	4 SH	MIM U620 Mass Customization Explores the field of mass customization (MC) in which a company provides customers with goods and services that suit their individual needs but does so with the efficiency and cost associated with mass production. MC is important in many sectors including computers, automotive, health care, banking, insurance, and tourism. Provides students with conceptual understanding and implementation strategies of MC, based on principles of industrial engineering, mechanical engineering, management science, and marketing. Topics include typology of mass-customized production systems, manufacturing processes for MC, information needs of MC, customer focus, marketing issues, technology enablers, implementation methods, and case studies. Lectures, case discussions, plant visits, guest lectures, and a term project are used. Cross-disciplinary activities, particularly between engineering and business students, are encouraged wherever possible. <i>Prereq. Junior or senior standing.</i>	4 SH
MIM U531 Lab for MIM U530 Accompanies MIM U530. Covers topics from the course through various activities. <i>Coreq. MIM U530. Prereq. Junior or senior standing.</i>	1 SH	MIM U625 Facilities Planning and Material Handling Explores engineering tools, techniques, and concepts for the design of facilities. The term facility is defined broadly. Industrial plants, schools, hospitals, or places in which things are produced or services are provided to a customer are all considered facilities. Provides students with a broad but practical understanding of the facilities planning and design process. The critical nature of material handling is discussed and	4 SH
MIM U550 Mechanical Engineering Design Explores development of the mechanical design process and its open-ended nature. Reviews fundamentals of stress and theories of failure including fatigue considerations in the analysis of various machine components. Treatment is given to shafts, springs, screws, connections, lubrications, bearings, gears, and tolerances. Includes team-based design projects that involve modeling and the design process. <i>Prereq. MIM U355.</i>	4 SH		
MIM U555 System Analysis and Control Presents the theoretical backgrounds for the analysis and design of simple feedback control systems, differential equations, and Laplace transforms. Treats system modeling, linear approximations, transfer functions, and block diagrams; transient and frequency response and stability-frequency domain and root locus methods. Other topics may include linear systems with time lag and relay servomechanisms with small nonlinearities. <i>Prereq. MIM U455.</i>	4 SH		

approaches to designing optimal handling systems are examined. The tools of operations, research, statistical methods, and software applications are the focus of the problem-solving activities. *Prereq. MIM U412.*

MIM U640 Mechanical Behavior and Processing of Materials 4 SH
Continues studies of the physical basis for the mechanical behavior of solid material including elasticity, plasticity, viscoelasticity, fracture, fatigue, and creep properties. Also covers materials processing and includes casting, forming, joining, and machining. *Prereq. MIM U340 and MIM U355.*

MIM U650 Advanced Strength and Applied Elasticity 4 SH
Introduces plane elasticity problems using rectangular and polar coordinates; Airy stress function. Discusses rotating disks and thick-walled pressure vessels, beams on elastic foundation, energy methods applied to beams and plates, and Rayleigh-Ritz method applied to various structural members in the calculation of deflection and buckling loads. *Prereq. MIM U355.*

MIM U655 Analytical Dynamics and Advanced Vibrations 4 SH
Explores variational methods and Lagrange's equations. Covers single and multiple degrees of freedom, vibration of continuous systems such as beams and plates, and free and forced vibration analysis. Discusses various solution techniques including modal analysis and the convolution integral representation. Numerical and approximate techniques, such as Rayleigh's quotient and the Galerkin method, are also treated. *Prereq. MIM U455.*

MIM U660 Computer-Aided Design 4 SH
Examines the field of computer-aided design. Introduces the concepts of 3-D geometric modeling of mechanical parts and assemblies. Covers the fundamentals of curves and surfaces that are utilized to create "real" parts that have complex shapes. Covers the concepts of parametric solid modeling that are utilized by all commercial CAD/CAM systems. Includes solid modeling techniques such as linear/nonlinear sweep, CSG, and B-rep. Introduces the basics of geometric relations and constraints. Shows how to create assemblies from individual parts. Covers CAD/CAM applications such as mass properties, mechanical tolerances, finite element modeling and analysis, and CNC tool path generation. A commercial CAD/CAM system is used to provide students with hands-on experience in a lab setting to master the concepts covered in the course. *Prereq. GE U110.*

MIM U670 Internal Combustion Engine 4 SH
Presents the concepts and theories of operation of internal combustion engines based upon the fundamental engineering sciences of thermodynamics, gas dynamics, heat transfer, and mechanics. Discusses the design and operating characteristics of conventional spark-ignition, compression-ignition, Wankel, and stratified charge. Explores the relationship between vehicle load and engine load through differential and transmission gear-ratio selections. Includes laboratory experiments. *Prereq. MIM U380 and MIM U475.*

MIM U677, MIM U678, MIM U679 1 SH each
Honors Adjunct

Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MIM U680 Energy Systems 4 SH
Focuses on the design and operating characteristics of thermal energy systems such as steam power plants, gas turbines, fuel cells or heating, ventilation and air-conditioning systems. Reviews selected topics in thermofluids as needed, and introduces new topics such as reacting mixtures and combustion, chemical energy and chemical equilibrium, one-dimensional internal compressible flow through nozzles and diffusers, and normal shock waves. These topics are then applied to the energy systems under study. *Prereq. MIM U380.*

MIM U695 Aerodynamics 4 SH
Focuses on topics of practical importance in applications of fluid mechanics to external flows over bodies. Topics include compressible flow analysis in order to use the concepts of sound speed and Mach number and to design subsonic and supersonic nozzles, diffusers, and airfoils. Normal and oblique shock waves and the Prandtl-Meyer expansion are introduced and applied to supersonic flows over bodies and surfaces. The Bernoulli equation and potential flow theory are studied and applied to external flow analyses and the theory of lift generation on airfoils. Studies external viscous flow to focus on the origin of drag and techniques for drag reduction. Introduces the effects of high-altitude flight and gas rarefaction including the molecular distribution and Knudsen number. Introduces computational methods in fluid mechanics. *Prereq. MIM U475.*

MIM U699 Special Topics in Mechanical Engineering 4 SH
Focuses on advanced mechanical engineering project agreed upon between the student and instructor. *Prereq. Permission of the department.*

MIM U700 Mechanical Engineering Research 4 SH
Focuses on scientific research in mechanical engineering agreed upon between the student and instructor. *Prereq. Permission of the department.*

MIM U701 Capstone Design 1 1 SH
Offers the first in a two-course sequence that culminates the student's education and experience with the design process. Students form teams and are assigned their design project and faculty adviser. Projects can be industrially, departmentally, or externally sponsored. Students are expected to communicate with their faculty adviser, course coordinator, and sponsor using the Internet, teleconferencing, and other electronic methods. Topics include project management, ethics, cost analysis, Internet and library research methods, and engineering codes and standards. Students prepare written reports and make oral presentations. Students are expected to complete a thorough state-of-the-art report on their problem and a problem statement with specifications and requirements. *Prereq. MIM U550, MIM U570, and senior standing.*

MIM U702 Capstone Design 2 5 SH
 Continues MIM U701. Students are expected to apply engineering principles acquired throughout their undergraduate academic and co-op experiences to the design of a system, component, or process. Each project includes the development and use of design methodology, formulation of design problem statements and specifications, consideration of alternative solutions, feasibility considerations, and detailed system descriptions. Projects include realistic constraints such as economic factors, safety, reliability, maintenance, aesthetics, ethics, and political and social impact. Students make oral presentations on their results in a series of design reviews. Students document their solutions using a written report that includes an executive summary. A working prototype or simulation, as appropriate, of their solution is required to complete the course. *Prereq. MIM U701.*

MIM U921 Directed Study 1 SH
 MIM U922 Directed Study 2 SH
 MIM U923 Directed Study 3 SH
 MIM U924 Directed Study 4 SH
 Offers theoretical or experimental work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

MIM U931 Independent Study 1 SH
 MIM U932 Independent Study 2 SH
 MIM U933 Independent Study 3 SH
 MIM U934 Independent Study 4 SH
 Offers theoretical or experimental work under individual faculty supervision. *Prereq. Permission of instructor.*

MIM U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

MIM U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. MIM U970 and honors program participation.*

MANAGEMENT INFORMATION SYSTEMS

COLLEGE OF BUSINESS ADMINISTRATION

MIS U277, MIS U278, MIS U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MIS U301 Management Information Systems 4 SH
 Addresses the role of information and computer-based information systems in managing business organizations. Topics include hardware and software concepts; strategic use of information technology; applications such as databases, decision support systems, and collaboration systems; telecommunications; e-commerce; knowledge management and information-based business processes; ethics, informational privacy and security; the design and development of information systems; and management of the IS function. Focuses on information systems in business from a managerial perspective, rather than teaching specific software skills. *Prereq. Sophomore standing or above.*

MIS U305 Information Resource Management 4 SH
 Examines the strategic and organizational issues associated with implementing and using information systems to achieve competitive advantage, create new products and services, redesign business operations, and alter relations with customers and suppliers. Addresses how information technology is used to support the functional areas of business such as finance, accounting, marketing, manufacturing, and human resource management. Explores the issues involved in investing in new technologies. *Prereq. MIS U301.*

MIS U402 Business Programming 4 SH
 Provides students with experience in structured reasoning and programming. Gives students an opportunity to gain an appreciation for design, coding, debugging, and executing program modules. Emphasizes the design methodologies required to create such modules. *Prereq. MIS U301.*

MIS U403 Data Management and Information Analysis 4 SH
 Provides students with an in-depth understanding of the information systems development life cycle (SDLC), from the conceptual, logical, and physical design stages through the implementation and maintenance stages. Emphasizes the practical application of the SDLC to the detailed design and construction of a departmental-level database in a project-based environment. Database topics include data models and modeling techniques; structured and object design approaches; differing database architecture such as hierarchical, network, relational, and object oriented; the development of the user interface; the function of data dictionaries, repositories, and warehouses; use of CASE tools and data-mining applications; and the role of the database administrator. Students also develop experience in conducting the information analysis required for decision support. *Prereq. MIS U301.*

MIS U404 Business Data Communications 4 SH
 Provides a comprehensive introduction to the principles and techniques of business data communications, from the fundamentals of telecommunications systems to the strategic use of telecommunications. Directed toward the business student who desires a technical overview of the concepts of data transmission and methodologies employed in designing and managing communication networks. *Prereq. MIS U301.*

MIS U406 Designing Web Applications 4 SH
Provides students with the opportunity to design Web-based applications for business. Identifies both software and hardware necessary to implement these applications. Students work on a semester-long project designed to enhance concepts introduced in the class concerning Internet-based applications.
Prereq. MIS U301.

MIS U408 Knowledge Management 4 SH
Provides an overview of the field of knowledge management. Knowledge is a key strategic resource in today's economy, and organizations must create and share it effectively to be successful. Some of the most creative applications of information technology are those that enable teamwork, communication, problem solving, and innovation. Examines how knowledge differs from data and information, the role knowledge plays in organizations, and the role information technology can play in managing that knowledge. *Prereq. MIS U301.*

MIS U410 Multimedia Applications 4 SH
Explores the business uses of audio and video technologies and examines how businesses can use them for future growth.
Prereq. MIS U301.

MIS U477, MIS U478, MIS U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MIS U501 Business Systems Integration 4 SH
Explores strategies for the technical and organizational integration of information systems through a hands-on project requiring students to form companies, analyze their data needs, design and build a set of information systems, and recommend a strategy for their integration within and between companies.
Prereq. MIS U305 and MIS U403.

MIS U512 Special Topics in Information Technology Management 4 SH
Examines various contemporary issues in information technology management. Topics may include wireless technologies for business; the emergence of global information systems; collaborative implementation; and others. *Prereq. Permission of instructor.*

MIS U677, MIS U678, MIS U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MIS U921 Independent Study 1 SH
MIS U922 Independent Study 2 SH
MIS U923 Independent Study 3 SH
MIS U924 Independent Study 4 SH

Allows students who have received approval to undertake independent study in lieu of any course required in the various concentrations. Students present proposals to an Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study takes place. A copy of the final report prepared by the student is presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from concentration coordinators.

Prereq. Permission of instructor.

MIS U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

MIS U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. MIS U970 and honors program participation.*

MARKETING

COLLEGE OF BUSINESS ADMINISTRATION

MKT U201 Introduction to Marketing 4 SH
Provides an overview of the role of marketing in business and society. Considers the planning, implementation, and evaluation of marketing efforts in consumer and business-to-business companies, in service and goods companies, and in for-profit and nonprofit organizations. Also examines contemporary issues in marketing that can affect organizational success. A term project is used to enable students to apply their learning about the fundamentals of marketing. *Prereq. Sophomore standing or above.*

MKT U277, MKT U278, MKT U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

- MKT U301 Marketing Management** 4 SH
Focuses on the marketing process through the use of case studies simulating actual business settings and marketing challenges. Develops skill in marketing decision making, critical analysis, and communication. Topics include techniques for undertaking market analysis, marketing strategy (segmentation and positioning), and marketing implementation (4 P's). A marketing plan project is used to enable students to apply their learning about the marketing process. *Prereq. MKT U201 and junior or senior standing.*
- MKT U310 Retailing** 4 SH
Explores the dynamics of retailing and focuses on the key retailing functions of market orientation, marketplace trends, customer service, operations management, layout and design, merchandising, retail technology, pricing, inventory and expense control, image management, retail promotion, and e-commerce. Students then work as consultants to an actual retailer, providing detailed analysis and recommendations concerning the aforementioned key functions. *Prereq. MKT U201 and junior or senior standing.*
- MKT U401 Marketing Research** 4 SH
Focuses on the marketing research process and the analysis of data using statistical software. Helps students develop an understanding of consumer attitudes and behavior processes as the basis of the design of marketing problems. Topics include problem definition, research design, sampling, attitude measurement, questionnaire design, data collection, and data analysis. Students are expected to work on group projects. The course requires no previous computer experience. *Prereq. MKT U201, MSC U201, and 64 SH toward degree.*
- MKT U420 Sales Management** 4 SH
Focuses on the entire sales effort. Offers students the opportunity to apply a proven selling process and present compelling solutions to customers. Topics include how to translate product features into buyer benefits, how to handle customer objections, and how to close sales and deals. Covers team selling and relationship marketing. Intended for students interested in a sales career as well as future product managers who must rely on the sales force to introduce new products and promotions. *Prereq. MKT U201 and junior or senior standing.*
- MKT U477, MKT U478, MKT U479** 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- MKT U502 Marketing in the Service Sector** 4 SH
Provides a basic treatment of methods and techniques for marketing in the service sector, which includes sports, recreation, public service, banking, insurance, and hotels. Analyzes a number of descriptive studies covering the application of marketing principles in key service areas as well as the principles themselves. *Prereq. MKT U201 and junior or senior standing.*
- MKT U504 Advertising Management** 4 SH
Focuses on the management of the advertising function in relation to a company's overall marketing objectives. Approaches the subject from the perspective of the user of advertising (for example, the product manager and the marketing manager). *Prereq. MKT U201 and junior or senior standing.*
- MKT U506 Consumer Behavior** 4 SH
Focuses on demographics, lifestyle, social and cultural trends, and their impact on consumer motivations and behavior. A thorough understanding of the consumer is at the heart of marketing. Topics include the consumer decision-making process, family, learning, personality, and group dynamics, and their impacts on the business world. Ultimately, we are all consumers and we are all part of society, so consumer behavior is critical to all of us. *Prereq. MKT U201 and junior or senior standing.*
- MKT U508 Electronic Marketing** 4 SH
Examines the impact of technology on the marketing of goods and services. Focuses on the Internet and the World Wide Web. Investigates recent trends in e-business and identifies marketing strategies that work in this new environment. Introduces students to frameworks that help explain current issues in electronic marketing. Although the focus is on Internet marketing strategy, phenomena such as television home shopping and database marketing are also explored. Readings, cases, discussions, lectures, guest speakers, student reports, and exercises on the World Wide Web are all utilized. *Prereq. MKT U201 and junior or senior standing.*
- MKT U510 New Product and Brand Management** 4 SH
Provides an overview of the new-product-development process, with an emphasis on customer involvement in this process. Detailed insights are provided on such topics as new-product strategy; idea generation; idea selection and evaluation; concept development and testing; product development and testing; and market testing. Also focuses on the challenges and decisions that managers face in launching and managing new products and services throughout their life cycle. *Prereq. MKT U401 and junior or senior standing.*
- MKT U512 International Marketing** 4 SH
Introduces those aspects of marketing that are unique to international business within the framework of traditional functional areas of marketing. Focuses on the environment and the modifications of marketing concepts and practices necessitated by environmental differences. Topics include cultural dynamics in international markets, political and legal environmental constraints, educational and economic constraints, international marketing research, international marketing institutions, and marketing practices abroad. *Prereq. MKT U201 and junior or senior standing.*

MKT U602 International Advertising 4 SH
Provides a provocative examination of two emerging forces in global advertising: the commitment of companies to compete in the global marketplace using global brands, and the strong shift in the power base from marketers to consumers in many countries. Examines the global consumer, from local to worldwide, and the complexities of creating global advertising campaigns to communicate with different cultures. Explores consumer insights, product concept and strategy development, and idea placement in a market. Studies actual global advertising campaigns from a major agency, and students develop a prototype campaign for an existing brand. The campaign is meant to satisfy the often differing priorities of advertisers and ad agencies, as discussed in the course. *Prereq. Honors program participation or permission of instructor.*

MKT U921 Independent Study 1 SH
MKT U922 Independent Study 2 SH
MKT U923 Independent Study 3 SH
MKT U924 Independent Study 4 SH
Allows students who have received approval to undertake independent study in lieu of any course required in the various concentrations. Students present proposals to an Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study takes place. A copy of the final report prepared by the student is presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from concentration coordinators. *Prereq. Permission of instructor.*

MKT U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

MKT U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. MKT U970 and honors program participation.*

MEDICAL LABORATORY SCIENCE

BOUVÉ COLLEGE OF HEALTH SCIENCES

MLS U101 MLS Orientation 1 SH
Introduces students to the health-care delivery system and the profession of medical laboratory science. Topics include a brief history of the development of medicine and the profession of medical technology, medical terminology, foundations of

quality assurance and quality control, and career cooperative education preparation skills. Develops an understanding of cooperative education learning objectives. Covers how to prepare résumés, improve interviewing skills, and develop strategies to solve work-related challenges on the job. Modes of instruction include case studies, group exercises, role-play, oral presentations, and written assignments.

MLS U201 Laboratory Techniques 2 SH
Focuses on the principles and theories of basic technical skills needed to work in a clinical or research laboratory. Lecture topics include laboratory safety and OSHA regulations, basic laboratory calculations and solution preparation, phlebotomy collection techniques, quality control and quality assurance, and method evaluation. Spectral and electrochemical instrumentation, pipetting, and microscopy are included. *Coreq. MLS U202. Prereq. CHM U214 or taken concurrently.*

MLS U202 Lab for MLS U201 1 SH
Accompanies MLS U201. Introduces students to essential techniques needed for working in a clinical or research laboratory. Laboratory activities incorporate issues of laboratory safety, aseptic technique and OSHA regulations, and quality assurance and quality control while teaching solution preparation, spectral and electrochemical instrumentation, pipetting, microscopy, and blood collection procedures. *Coreq. MLS U201. Prereq. CHM U214 or taken concurrently.*

MLS U277, MLS U278, MLS U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MLS U299 Foundations of Forensic Lab Science 3 SH
Introduces students to the basis for genetic and chemical analysis of forensic evidence. Discusses scientific information that forms the basis for DNA testing and the identification of drugs of abuse. Provides students with an understanding of how these specific scientific technologies are used in forensic investigations, how the evidence is collected, and how the scientific results are used in court to provide information to those who are charged with determining guilt or innocence. Instructional formats include lecture, discussion, question-and-answer sessions, and reading assignments. Specific case studies are used as illustrations.

MLS U301 Fundamentals of Core Lab Techniques 3 SH
Discusses principle, procedures, and clinical significance of basic hematology procedures, normal cell morphology, urinalysis, serology, body fluids, selected clinical chemistry analyses, and point-of-care testing. An emphasis is placed on both manual and automated methods including quality control, sources of error, data analysis, and results correlation. *Coreq. MLS U302. Prereq. MLS U201, MLS U202, BIO U111, and CHM U211 or permission of instructor.*

- MLS U302 Lab for MLS U301 2 SH
Accompanies MLS U301. Acquaints students with laboratory safety and specimen handling. Laboratory exercises introduce students to the procedures of basic medical laboratory assays including hematology, urinalysis, serology, body fluid analysis, selected clinical chemistry analyses, and point-of-care testing. An emphasis is placed on both manual and automated methods including quality control, sources of error, data analysis, and results correlation. *Coreq. MLS U301. Prereq. MLS U201, BIO U111, and CHM U211 or permission of instructor.*
- MLS U315 Medical Immunology 3 SH
Explores the principles of basic immunology. Topics include innate and acquired immunity, organs and cells of the immune systems, antigens and antibodies, and soluble mediators. Also discusses the immune response in infectious diseases and hypersensitivity reactions. Selected classic case studies are presented to demonstrate the role of immunologic and serologic laboratory testing in the diagnosis and treatment of disease. *Prereq. MLS U301 and MLS U302 or permission of instructor.*
- MLS U477, MLS U478, MLS U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- MLS U505 Medical Microbiology 1 4 SH
Introduces the principles and techniques of organism isolation, cultivation, and identification from clinical specimens. Discusses identifying bacteria, yeast, and fungi that are pathogenic for humans according to the isolated organisms' clinical specimen. Emphasizes how to collect and transport specimens, what laboratory protocols to use in diagnosis, and procedures for identifying organisms. *Coreq. MLS U506. Prereq. MLS U315.*
- MLS U506 Lab for MLS U505 1 SH
Accompanies MLS U505. Practices techniques of organism isolation, cultivation, and identification from clinical specimens. Practices identifying bacteria, yeast, and fungi that are pathogenic for humans according to the isolated organism's clinical specimen. Emphasizes laboratory protocols to use in diagnosis, and procedures for identifying organisms. Focuses on developing skill in the aseptic processing of cultures for various human pathogenic bacteria, yeast, and fungi. An emphasis is placed on traditional methodologies with an introduction to system approaches and automated procedures. *Coreq. MLS U505. Prereq. MLS U315.*
- MLS U520 Fundamentals of Hematology 4 SH
Emphasizes hematopoiesis, maturational characteristics of hematologic cells, and abnormal morphology of erythrocytes, leukocytes, and thrombocytes. The principles of hemostasis and thrombosis are included. Case studies are discussed in each topical category. *Coreq. MLS U521. Prereq. MLS U301 and MLS U302 or permission of instructor.*
- MLS U521 Lab for MLS U520 1 SH
Accompanies MLS U520. Stresses maturation and abnormal morphology of erythrocytes, granulocytes, and thrombocytes. Case studies related to specific smears are discussed. Basic coagulation instrumentation is included. *Coreq. MLS U520. Prereq. MLS U301 and MLS U302 or permission of instructor.*
- MLS U530 Clinical Chemistry 4 SH
Covers the principles of clinical chemistry with an emphasis on the clinical significance and pathophysiology of related disease states, and common methods of quantitating selected important analyses. Discusses acquisition, management, and application of laboratory data. *Coreq. MLS U531. Prereq. MLS U301 and MLS U302.*
- MLS U531 Lab for MLS U530 1 SH
Accompanies MLS U530. Practices basic manual and automated techniques in clinical chemistry. *Coreq. MLS U530. Prereq. MLS U301 and MLS U302.*
- MLS U541 Virology 2 SH
Introduces clinical virology with the focus on the approach used in a clinical virology laboratory to isolate and identify viruses of pathogenic significance. After a general review of the principles of virology, each class of viruses is discussed as it relates to structure, replication mechanisms, pathogenic mechanisms, identification, and treatment protocols. *Prereq. MLS U505, MLS U506, and junior or senior standing.*
- MLS U542 Medical Microbiology 2 2 SH
Continues MLS U505. Examines host and microbial interactions in disease produced by viruses, rickettsia, chlamydia, mycoplasma, mycobacteria, anaerobic bacteria, and actinomycetes. Also covers host and microbial interactions in gastrointestinal, genitourinary, and respiratory tract infections. Discusses disease states, diagnostic procedures, and antimicrobial testing. Also examines parasites and viruses that are pathogenic to man including pathogenesis, relevant clinical symptoms, and diagnostic criteria. The integrated laboratory stresses the isolation and identification techniques of medically important parasites. *Coreq. MLS U543. Prereq. MLS U505, MLS U506, and junior or senior standing.*
- MLS U543 Lab for MLS U542 2 SH
Accompanies MLS U542. Focuses on the principles of immunohematology with specific application to the ABO system, Rh and other blood group systems, antibody detection and identification, crossmatching, transfusion reactions, blood components, and hemolytic disease of the newborn. *Coreq. MLS U542. Prereq. MLS U505, MLS U506, and junior or senior standing.*

MLS U550 Immunohematology Practices ABO grouping and Rh typing, cross matching, antibody identification, and donor screening. <i>Coreq. MLS U551. Prereq. MLS U315 and senior standing or permission of instructor.</i>	3 SH	MLS U700 Undergraduate Research Examines a special problem in lab medicine involving individual research under the direction of a faculty member. <i>Prereq. Permission of instructor.</i>	2 SH
MLS U551 Lab for MLS U550 Accompanies MLS U550. Integrates the fundamental concepts and processes of normal anatomy and physiology, the relationship of developmental stages and other factors related to dysfunction, and specific disorders traditionally organized by body systems. Discussion and problem-solving techniques are used to analyze, apply, and interpret relevant clinical and laboratory data to selected case studies. <i>Coreq. MLS U550. Prereq. MLS U315 and senior standing or permission of instructor.</i>	1 SH	MLS U900 Special Topics Covers current topics in the clinical laboratory. Instructional formats include lecture, discussion, question-and-answer sessions, and reading assignments. <i>Prereq. Permission of instructor.</i>	2 SH
MLS U601 Pathophysiology and Clinical Correlation Integrates the fundamental concepts and processes of normal anatomy and physiology, the relationship of developmental stages and other factors related to dysfunction, and specific disorders traditionally organized by body systems. Discussion and problem-solving techniques are used to analyze, apply, and interpret relevant clinical and laboratory data to selected case studies. <i>Prereq. MLS U506, MLS U520, MLS U530, and senior standing or permission of instructor.</i>	3 SH	MLS U921 Directed Study MLS U922 Directed Study MLS U923 Directed Study MLS U924 Directed Study Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i>	1 SH 2 SH 3 SH 4 SH
MLS U605 Management and Education Focuses on fundamental theories and practices in the fields of management and education. The management portion introduces factors that relate to effective lab administration such as hospital organizational structure; principles of management and supervision; financial management; purchasing; governmental regulatory and certification compliance; voluntary accreditation issues; legal responsibilities; and human resource relations. Other topics include the application of computer technology to the management of biological and medical information, and the role of databases and algorithms in clinical medicine information technology. Comprises case studies, group exercises, role-play, oral presentations, and written assignments. The education portion addresses the topics of development of learning objectives, methods of evaluation and certification, clinical instruction and evaluation, use of media, and other methods of instruction. Comprises lectures, discussions, question-and-answer sessions, and readings. <i>Prereq. Senior standing or permission of instructor.</i>	3 SH	MLS U940 Microbiology Clinical Applied Study Offers clinical practicum in applied microbiology at an affiliated hospital providing MT (ASCP)- and CLA (NCA)-level instruction. <i>Prereq. MT clinical program admission.</i>	4 SH
MLS U606 Lab Management Applications Identifies and resolves management problems encountered in a modern hospital laboratory. <i>Prereq. MLS U605 and MT Clinical Applied Study taken concurrently (MLS U940-MLS U944).</i>	1 SH	MLS U941 Immunology Clinical Applied Study Offers clinical practicum in applied clinical immunology at an affiliated hospital providing MT (ASCP)- and CLA (NCA)-level instruction. <i>Prereq. MT clinical program admission.</i>	2 SH
MLS U677, MLS U678, MLS U679 Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each	MLS U942 Hematology Clinical Applied Study Offers clinical practicum in applied hematology at an affiliated hospital providing MT (ASCP)- and CLS (NCA)-level instruction. <i>Prereq. MT clinical program admission.</i>	3 SH
		MLS U943 Clinical Chemistry Clinical Applied Study Offers clinical practicum in applied clinical chemistry at an affiliated hospital providing MT (ASCP)- and CLA (NCA)-level instruction. <i>Prereq. MT clinical program admission.</i>	4 SH
		MLS U944 Immunohematology Clinical Applied Study Offers clinical practicum in applied immunohematology at an affiliated hospital providing MT (ASCP)- and CLS (NCA)-level instruction. <i>Prereq. MT clinical program admission.</i>	3 SH
		MLS U960 MLS Senior Seminar Reviews current undergraduate medical lab science topics. Instructional formats include lecture, discussion, question-and-answer sessions, and reading assignments. <i>Prereq. Senior standing.</i>	2 SH
		MLS U970 Junior/Senior Project 1 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i>	4 SH

MLS U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. MLS U970 and honors program participation.*

MULTIMEDIA STUDIES

COLLEGE OF ARTS AND SCIENCES

MMS U277, MMS U278, MMS U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MMS U300 Narrative in Multimedia 4 SH
 Explores multimedia of today and the demands of nontraditional methods of storytelling. Integrates components of multimedia including text, video, film, music, audio, and graphics. Instructs students in the art of developing a story to communicate an idea, explores the process of writing narrative through lectures and in class workshops, and instructs students in the art of developing narrative specifically for multimedia production. *Prereq. Multimedia dual majors only or permission of instructor.*

MMS U305 Programming for Multimedia 4 SH
 Exposes students to processes involved with various types of computer programming used in multimedia. Structured in four main sections: overview and history, elements of a general-purpose programming language, introduction to Web design and Web-based languages, and domain-specific multimedia languages. *Prereq. Multimedia dual majors only or permission of instructor.*

MMS U400 Hypermedia 4 SH
 Introduces students to principles of screen-based information and design. Covers first half of the information architecture and user interface curriculum. Exposes students to content within Web sites or computer-based pieces that are largely invisible and often difficult to grasp. Includes principles of organizational structures, planning and mapping of content, content and relationships, and basic design for the digital delivery of information. Offers students the opportunity to create interfaces, which impart meaning through creative organization, transformation, and presentation of data. *Prereq. ART U130.*

MMS U450 Special Topics in Hypermedia 4 SH
 Expands on the information architecture curriculum begun in MMS U400. Concentrates on cognitive and interactive issues. Exposes students to the theories, principles, and process of planning and designing highly usable, experientially transparent user interface (UI). Offers students the opportunity to learn concepts of user-computer interaction, legibility and visual

organization, and interaction topologies, as well as how to apply these ideas in the development of a workable UI. May be taken more than once since topic areas differ every time the class is offered. *Prereq. MMS U400 and junior or senior standing.*

MMS U460 Special Topics in Multimedia 4 SH
 May be taken more than once since topic areas differ every time the class is offered. Topics include video production for the Web; interactive learning modules; DVD development and production; and projects referencing animation, graphic design, digital imaging, and/or music technology. *Prereq. Junior or senior standing.*

MMS U477, MMS U478, MMS U479 1 SH each
 Honors Adjunct
 Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MMS U500 Multimedia Studies History 4 SH
 Surveys the development of multimedia technologies, with particular emphasis on the emergence of the digital age and interactive platforms. Examines the critical and theoretical underpinnings of multimedia practices. Integrates the historical study of multimedia with current work in the field. *Prereq. Junior or senior standing.*

MMS U600 Business, Law, and Multimedia 4 SH
 Educates students in the practical aspects that guide the multimedia industry. Examines major roles in the day-to-day issues of the business of multimedia; includes, in addition to the artist, CD-ROM developers, publishers, distributors, venture capitalists, lawyers, and agents. Familiarizes students with the financing, licensing, copyright, and contracts of multimedia, and, most significantly, the laws associated with the interpretation and use of intellectual property. Covers issues of ethics and morality. *Prereq. Junior or senior standing.*

MMS U677, MMS U678, MMS U679 1 SH each
 Honors Adjunct
 Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MMS U700 Multimedia Capstone 1 4 SH
 Utilizes skills learned in MMS U300, MMS U305, and MMS U400 to research, plan, and design the concept for an entire multimedia project while working in project teams. Projects may include planning and developing an educational CD-ROM, a computer-based entertainment product, or an Internet Web site designed for e-commerce. Fulfills experiential education requirement for multimedia studies dual majors. *Prereq. MMS U300, MMS U305, MMS U400, and senior standing.*

MMS U701 Multimedia Capstone 2 4 SH
Continues MMS U700. Realizes multimedia projects that were planned and developed in the previous course, with students working in project teams. Examples of projects include an educational CD-ROM, a computer-based entertainment product, or an Internet Web site designed for e-commerce. Is the final course in the multimedia studies dual major's curriculum. *Prereq. MMS U700 and senior standing.*

MMS U921 Directed Study 1 SH
MMS U922 Directed Study 2 SH
MMS U923 Directed Study 3 SH
MMS U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

MMS U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

MMS U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. MMS U970 and honors program participation.*

MANAGEMENT SCIENCE

COLLEGE OF BUSINESS ADMINISTRATION

MSC U201 Business Statistics 4 SH
Provides students with the necessary skills to collect, summarize, analyze, and interpret business-related data. Covers the basic language and concepts of statistics including the sources and methods of data collection; useful numeric and graphic summaries; variability; data distributions; sampling and sampling distributions; basic ideas of statistical inference; relationships between variables; and formulating and testing hypotheses. Also explores how to build prediction and forecasting models for chosen variables using related variables, such as time. Statistical software tools, learning aids, and sources on the Internet are used. Students conduct a semester-long data analysis project, and they practice communicating their findings via written reports.

MSC U277, MSC U278, MSC U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MSC U401 Operations Management 4 SH
Considers the productive system of an enterprise whereby inputs of people, materials, information, and technology are transformed into useful goods and/or services. Topics include types of production processes, process flow analysis, capacity analysis, inventory and quality management, and so on. Provides an overview of the problems and issues encountered by an operations manager. Although a variety of models and techniques are discussed, the emphasis is on the problem formulation, managerial implication, and the impact on operations strategy. *Prereq. MSC U201 and sophomore standing or above.*

MSC U477, MSC U478, MSC U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MSC U677, MSC U678, MSC U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MATHEMATICS

COLLEGE OF ARTS AND SCIENCES

MTH U010 Algebra Review 4 SH
Designed for arts and sciences, criminal justice, and other majors who need to build their algebraic skills in order to succeed in the next math or math-related courses required by their major. Most students are directed to this course as a result of placement tests. Concepts include solving first- and second-degree equations, understanding slopes and graphs of lines, solving simultaneous equations in several variables, solving rational equations, and graphing inequalities. Requires the analysis and solution of word problems. (Does not count toward graduation credit.)

MTH U100 Introduction to College 1 SH
Designed for freshman math majors to introduce them to one another, their major, their college, and the University. Students are introduced to our advising system, register for next semester's courses, and learn more about co-op. Also helps students develop the academic and interpersonal skills necessary to succeed as a university student. *Prereq. Math major.*

MTH U110 College Algebra 4 SH
Covers laws of exponents, roots, graphing of equations and inequalities, special curves (that is, conic sections), functions and operations on functions, complex numbers, matrices, and vectors. If time permits, also explores elementary discrete probability and least squares curve fitting. *Prereq. Primarily for BSET majors.*

- MTH U115 Applications of Algebra** 4 SH
Covers linear equations and inequalities, systems of equations, matrices and linear programming (geometric and simplex methods), Markov chains, set and set operations, tree diagrams, combinations and permutations, elementary probability, and statistics.
- MTH U117 Interactive Mathematics** 4 SH
Develops problem-solving skills while simultaneously teaching mathematics concepts; particularly suited to students who work well in collaborative groups and who enjoy writing about the concepts they are learning. Assessment is based on tests, portfolios, written projects, and solutions to “problems of the week.” Each unit centers on a particular applied problem, which serves to introduce the relevant mathematical topics. These include linear programming, curve fitting, elements of probability and statistics, and polling theory.
- MTH U121 Precalculus** 4 SH
Focuses on linear, polynomial, exponential, logarithmic, and trigonometric functions. Emphasis is placed on understanding, manipulating, and graphing these basic functions, their inverses and compositions, and using them to model real-world situations (that is, exponential growth and decay, periodic phenomena). Equations involving these functions are solved using appropriate techniques. Special consideration is given to choosing reasonable functions to fit numerical data.
Prereq. Basic understanding of algebraic manipulation assumed, including exponents and polynomials.
- MTH U130 College Math for Business and Economics** 4 SH
Introduces students to some of the important mathematical concepts and tools (such as modeling revenue, cost and profit with functions) used to solve problems in business and economics. Assumes familiarity with the basic properties of linear, polynomial, exponential, and logarithmic functions. Topics include the method of least squares, regression curves, solving equations involving functions, compound interest, amortization, and other consumer finance models. (Graphing calculator required, see instructor for make and model.) *Prereq. Basic knowledge of algebra, log, and exponential functions.*
- MTH U131 Calculus for Business and Economics** 4 SH
Provides an overview of differential calculus including derivatives of power, exponential, logarithmic, logistic functions, and functions built from these. Derivatives are used to model rates of change, to estimate change, to optimize functions, and in marginal analysis. The integral calculus is applied to accumulation functions and future value. Emphasis is on realistic business and economics problems, the development of mathematical models from raw business data, and the translation of mathematical results into verbal expression appropriate for the business setting. Also features a semester-long marketing project in which students gather raw data, model it, and use calculus to make business decisions; each student is responsible for a ten-minute presentation. (Graphing calculator required, see instructor for make and model.) *Prereq. MTH U130.*
- MTH U141 Calculus 1** 4 SH
Serves as both the first half of a two-semester calculus sequence and as a self-contained one-semester course in differential and integral calculus. Basic concepts and techniques of differentiation and integration are introduced and applied to polynomial, exponential, log, and trigonometric functions. The derivative as rate of change and integral as accumulator are emphasized. Applications include optimization, growth and decay, area, volume, and motion. *Prereq. MTH U121 or equivalent.*
- MTH U142 Calculus 2** 4 SH
Continues MTH U141. Introduces additional techniques of integration and numerical approximations of integrals and the use of integral tables; further applications of integrals. Also introduces differential equations and slope fields, and elementary solutions. Introduces functions of several variables, partial derivatives, and multiple integrals. *Prereq. MTH U141.*
- MTH U151 Calculus and Differential Equations for Biology 1** 4 SH
Begins with the fundamentals of differential calculus and proceeds to the specific type of differential equation problems encountered in biological research. Presents methods for the solutions of these equations and how the exact solutions are obtained from actual laboratory data. Topics include differential calculus: basics, the derivative, the rules of differentiation, curve plotting, exponentials and logarithms, and trigonometric functions; using technology to understand derivatives; biological kinetics: zero- and first-order processes, processes tending toward equilibrium, bi- and tri-exponential processes, and biological half-life; differential equations: particular and general solutions to homogeneous and nonhomogeneous linear equations with constant coefficients, systems of two linear differential equations; compartmental problems: nonzero initial concentration, two-compartment series dilution, diffusion between compartments, population dynamics; and introduction to integration. *Prereq. MTH U121 or equivalent.*
- MTH U152 Calculus and Differential Equations for Biology 2** 4 SH
Continues MTH U151. Begins with the integral calculus and proceeds quickly to more advanced topics in differential equations. Introduces linear algebra and uses matrix methods to analyze functions of several variables and to solve larger systems of differential equations. Advanced topics in reaction kinetics are covered. The integral and differential calculus of functions of several variables is followed by the study of numerical methods in integration and solutions of differential equations. Provides a short introduction to probability. Covers Taylor polynomials and infinite series. Special topics include reaction kinetics such as Michaelis-Menten processes, tracer experiments, and inflow and outflow through membranes. *Prereq. MTH U151.*
- MTH U160 Linear Programming** 4 SH
Covers linear equations and inequalities, systems of linear equations, Gauss-Jordan elimination, graphical solution to linear programming problems, algebraic solution by the Simplex method, and the principle of duality, with applications to optimization and game theory.

- MTH U170 Math Discovery and Computers 4 SH
Provides students with marketable scientific computing skills, and uses those skills to explore open-ended mathematical problems. Through guided processes of computing, reflecting, discussing, and writing, offers students the opportunity to expand their capacities to think productively about problems that are new to them. Such capacities are useful in all future courses and forms of employment.
- MTH U180 Statistical Thinking 4 SH
Introduces statistical thinking to students without using any sophisticated mathematics. Uses extensive class discussion and homework problems to cover statistical reasoning and to evaluate critically the usage of statistics by others. Readings from a wide variety of sources are assigned. Topics include descriptive statistics, sampling theory, and fundamentals of statistical inference (confidence intervals and hypothesis testing).
- MTH U201 History of Mathematics 4 SH
Traces the development of mathematics from its earliest beginning to the present. Emphasis is on the contributions of various cultures including the Babylonians, Egyptians, Mayans, Greeks, Indians, and Arabs. Computations and constructions are worked out using the techniques and notations of these peoples. The role of mathematics in the development of science is traced throughout, including the contributions of Descartes, Kepler, Fermat, and Newton. More modern developments are discussed as time permits. *Prereq. Interest in mathematics, facility in arithmetic and elementary algebra.*
- MTH U203 Foundations of Mathematics 4 SH
Investigates the modern revolutions in mathematics initiated by Cantor, Gödel, Turing, and Robinson in the fields of set theory, provability, computability, and analysis, respectively, as well as provides background on the controversy over the philosophy and underlying logic of mathematics. *Prereq. Interest in mathematics, logic, and philosophy.*
- MTH U230 Discrete Mathematics 4 SH
Provides the discrete portion of the mathematical background needed by students in electrical and computer engineering. Topics include Boolean algebra and set theory, logic, and logic gates; growth of functions, and algorithms and their complexity; proofs and mathematical induction; and graphs, trees, and their algorithms. As time permits, additional topics may include methods of enumeration and finite-state machines.
- MTH U240 Intensive Calculus for Engineers 6 SH
Contains the material from the first semester of MTH U241, preceded by material emphasizing the strengthening of pre-calculus skills. Topics include properties of exponential, logarithmic, and trigonometric functions; differential calculus; and introductory integral calculus.
- MTH U241 Calculus 1 for Science and Engineering 4 SH
Introduces differential calculus and integral calculus, with vectors. Topics include functions, rates of change, velocity and acceleration, tangent lines, rules for differentiation, exponential, logarithmic, trigonometric, and inverse-trigonometric functions, linear approximation, Newton's method, optimization, applications to physics, areas and Riemann sums, displacement, mass, the definite integral, properties of integrals, the fundamental theorem of calculus, integration by substitution, parametric curves, position and velocity vectors, dot product, linear combinations, and lines and planes in three dimensions.
- MTH U242 Calculus 2 for Science and Engineering 4 SH
Continues MTH U241. Topics include integration by parts and tables, numerical approximation techniques, improper integrals, and applications of integration to volumes, arc length, and work including line integrals. Covers separable differential equations with applications. Covers some elementary topics from linear algebra including vectors, matrices, and solutions of systems of linear equations. *Prereq. MTH U241.*
- MTH U243 Calculus 2 for Engineering Technology 4 SH
Builds upon the differential and integral calculus topics in MTH U241 to develop additional tools such as partial derivatives and multiple integrals needed by students of engineering technology. This course is not equivalent to MTH U242. *Prereq. MTH U241.*
- MTH U244 Intensive Calculus 2 for Science 6 SH
Introduces the definite integral, the fundamental theorem of calculus, and methods and applications of integration. Completes all the topics included in MTH U242. Designed for students of computer science (and the physical sciences or engineering) who are familiar with differential calculus at the science/engineering level but are not familiar with integral calculus. *Prereq. Familiarity with differential calculus at the science/engineering level.*
- MTH U277, MTH U278, MTH U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- MTH U280 Statistics and Software 4 SH
Provides an introduction to basic statistical techniques and the reasoning behind each statistical procedure. Covers appropriate statistical data analysis methods for applications in health and social sciences. Also examines a statistical package such as SPSS or SAS to implement the data analysis on computer. Topics include descriptive statistics, elementary probability theory, parameter estimation, confidence intervals, hypothesis testing, nonparametric inference, and analysis of variance and regression with a minimum of mathematical derivations. *Prereq. Non-math majors.*
- MTH U285 Probability with Statistics 4 SH
Presents an introduction to probability and probabilistic reasoning, sample spaces, events, and axioms. Studies conditional probability and Bayes law, independence, random variables and their distributions, distributions, expected value, and variance.

Covers the law of large numbers, and the central limit theorem. Introduces statistical inference such as confidence intervals, hypothesis testing with levels of significance, and Bayesian statistics.

MTH U300 Co-op Reflections Seminar 1 1 SH
Intended for math majors who have completed their first co-op assignment. Examines the mathematical problems encountered on the job, and relates them to courses already taken and to the student's future program. Faculty members and other guests contribute to the discussion. Grades are determined by the student's participation. *Prereq. Math major; after first co-op.*

MTH U341 Calculus 3 for Science and Engineering 4 SH
Continues MTH U242. Introduces linear functions and their matrices, defines the derivative as a linear function (Jacobian), and expresses the general chain rule in matrix form. Topics include partial derivatives and tangent planes; the gradient, divergence, and curl; multiple integrals; change of variable in multiple integrals; vector fields and line integrals; and Green's theorem. Students are expected to be familiar with the calculus of single-variable functions, vectors, and parametric curves. Several computer-lab projects are assigned, using software (Maple, MATLAB) available in University computer labs. *Prereq. MTH U242.*

MTH U343 Differential Equations and Linear Algebra 4 SH
for Engineering
Studies ordinary differential equations, their applications, and techniques for solving them including numerical methods (through computer labs using MS Excel and MATLAB), Laplace transform, and linear algebra. Topics include linear and nonlinear first- and second-order equations and systems of equations, and applications including population models, ecological models, mechanical systems, forced oscillation, and resonance. Techniques from linear algebra are developed and applied to systems of differential equations that include linear systems and matrices, vector spaces, and eigenvalue and eigenvector problems. *Prereq. MTH U242.*

MTH U345 Ordinary Differential Equations 4 SH
Studies ordinary differential equations from both the quantitative and qualitative points of view. They include first-order equations and systems, second-order equations, analytic solution techniques, numerical methods and visualization (through computer labs), and applications to mechanical and electrical oscillations. Emphasizes the dynamical systems approach including instances of chaos. *Prereq. MTH U242.*

MTH U371 Linear Algebra 4 SH
Uses the Gauss-Jordan elimination algorithm to analyze and find bases for subspaces such as the image and kernel of a linear transformation. Covers the geometry of linear transformations including orthogonality, the Gram-Schmidt process, rotation matrices, and least squares fit. Examines diagonalization and similarity, and the spectral theorem and the singular value decomposition. Is primarily for math and science majors; applications are drawn from many technical fields.

Computation is aided by the use of software such as Maple or MATLAB, and graphing calculators. *Prereq. MTH U242.*

MTH U400 Co-op Reflections Seminar 2 1 SH
Intended for math majors who have completed their second co-op assignment. Its goal is to examine the mathematical problems encountered on the job, and relate them to courses already taken and to the student's future program. Faculty members and other guests contribute to the discussion. Grades are determined by the student's participation in the course. *Prereq. Math major; after second co-op.*

MTH U430 Number Theory 4 SH
Introduces number theory. Topics include linear Diophantine equations; congruences; design of magic squares; Fermat's little theorem; Euler's formula; Euler's phi function; computing powers and roots in modular arithmetic; the RSA encryption system; primitive roots and indices; and the law of quadratic reciprocity. As time permits, may cover diophantine approximation and Pell's equation, elliptic curves, points on elliptic curves, and Fermat's last theorem.

MTH U433 Combinatorial Mathematics 4 SH
Introduces techniques of mathematical proofs including mathematical induction. Explores various techniques for counting such as permutation and combinations, inclusion-exclusion principle, recurrence relations, generating functions, Polya enumeration, and the mathematical formulations necessary for these techniques including elementary group theory and equivalence relations. *Prereq. Two semesters of calculus.*

MTH U441 Chaotic Dynamical Systems 4 SH
Presents an experimental study using simple mathematical models of chaotic behavior in dynamical systems. (Such systems are frequently found in science and industry.) Goals include the development of skills of experiment and inquiry, integration of visual and analytical modes of thought, and appreciation of issues of problem formulation and representation. *Prereq. Two semesters of calculus.*

MTH U477, MTH U478, MTH U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MTH U481 Probability and Statistics 4 SH
Focuses on probability theory. Topics include sample space; conditional probability and independence; discrete and continuous probability distributions for one and for several random variables; expectation; variance; special distributions including binomial, Poisson, and normal distributions; law of large numbers; and central limit theorem. Also introduces basic statistical theory including estimation of parameters, confidence intervals, and hypothesis testing. *Prereq. MTH U341.*

- MTH U525 Applied Analysis 4 SH
Demonstrates the applications of mathematics to interesting physical and biological problems. Methods are chosen from ordinary and partial differential equations, calculus of variations, Laplace transform, perturbation theory, special functions, dimensional analysis, asymptotic analysis, and other techniques of applied mathematics. *Prereq. MTH U341, MTH U371, and MTH U545.*
- MTH U530 Numerical Analysis 4 SH
Considers various problems including roots of nonlinear equations; simultaneous linear equations using direct and iterative methods of solution; eigenvalue problems; interpolation; and curve fitting. Emphasizes understanding issues rather than proving theorems or coming up with numerical recipes. *Prereq. Three semesters of calculus.*
- MTH U532 Numerical Solutions of Differential Equations 4 SH
Covers numerical problems in interpolation, differentiation, integration, Fourier transforms, and the solving of differential equations. Emphasizes practical methods and techniques. The heart of the course is a study of modern methods for finding numerical solutions of ordinary differential equations, both initial value problems and boundary value problems. Homework and projects are based on MATLAB. *Prereq. Three semesters of calculus.*
- MTH U541 Advanced Calculus 4 SH
Offers a deeper and more generalized look at the ideas and objects of the study of calculus. Topics include the generalized calculus of n -space, the inverse and implicit function theorems, differential forms and general Stokes-type theorems, geometry of curves and surfaces, and special functions. *Prereq. MTH U341 and MTH U371.*
- MTH U545 Fourier Series and PDEs 4 SH
Provides a first course in Fourier series, Sturm-Liouville boundary value problems, and their application to solving the fundamental partial differential equations of mathematical physics: the heat equation, the wave equation, and Laplace's equation. Green's functions are also introduced as a means of obtaining closed-form solutions. *Prereq. MTH U345.*
- MTH U550 Real Analysis 4 SH
Provides the theoretical underpinnings of calculus and the advanced study of functions. Emphasis is on precise definitions and rigorous proof. Topics include the real numbers and completeness, continuity and differentiability, the Riemann integral, the fundamental theorem of calculus, inverse function and implicit function theorems, and limits and convergence. Required of all mathematics majors. *Prereq. MTH U371 and three semesters of calculus.*
- MTH U555 Complex Variables 4 SH
Provides an introduction to the analysis of functions of a complex variable. Starting with the algebra and geometry of complex numbers, basic derivative and contour integral properties are developed for elementary algebraic and transcendental functions as well as for other analytic functions and functions with isolated singularities. Power and Laurent series representations are given. Classical integral theorems, residue theory, and conformal mapping properties are studied. Applications of harmonic functions are presented as time permits. *Prereq. MTH U341.*
- MTH U560 Geometry 4 SH
Studies classical geometry and symmetry groups of geometric figures, with an emphasis on Euclidean geometry. Teaches how to formulate mathematical propositions precisely and how to construct and understand mathematical proofs. Provides a line between classical and modern geometry with the aim of preparing students for further study in group theory and differential geometry. *Prereq. MTH U343 or MTH U371.*
- MTH U565 Topology 4 SH
Introduces the student to fundamental notions of topology. Introduces basic set theory, then covers the foundations of general topology (axioms for a topological space, continuous functions, homeomorphisms, metric spaces, the subspace, product, and quotient topologies, connectedness, compactness, and the Hausdorff condition). Also introduces algebraic and geometric topology (homotopy, covering spaces, fundamental groups, graphs, surfaces, and manifolds) and applications. Other topics are covered if time permits. *Prereq. MTH U341 and MTH U371.*
- MTH U571 Advanced Linear Algebra 4 SH
Provides a more detailed study of linear transformations and matrices such as LU factorization, QR factorization, Spectral theorem and singular value decomposition, Jordan form, positive definite matrices, quadratic forms, partitioned matrices, and norms and numerical issues. Topics and emphasis change from year to year. *Prereq. MTH U371.*
- MTH U575 Group Theory 4 SH
Presents basic concepts and techniques of the group theory including symmetry groups, axiomatic definition of groups, important classes of groups (abelian, cyclic, additive, and multiplicative groups of residues, permutation groups), Cayley table, subgroups, group homomorphism, cosets, the Lagrange theorem, normal subgroups, quotient groups, and direct products. Studies structural properties of groups. Possible applications include geometry, number theory, crystallography, physics, and combinatorics. *Prereq. MTH U371.*
- MTH U576 Rings and Fields 4 SH
Introduces commutative rings, ideals, integral domains, fields, and the theory of extension fields. Topics include Gaussian integers, Galois groups, and the fundamental theorem of Galois theory. Applications include the impossibility of angle-trisection and the general insolvability of fifth- and higher-degree polynomials. Other topics are covered as time permits. *Prereq. MTH U371.*

MTH U581 Statistics and Stochastic Processes 4 SH
Continues topics introduced in MTH U481. The first part of the course covers classical procedures of statistics including the t-test, linear regression, and the chi-square test. The second part provides an introduction to stochastic processes with emphasis on Markov chains, random walks, and Brownian motion, with applications to modeling and finance. *Prereq. MTH U481.*

MTH U585 Introduction to Actuarial Math 4 SH
Introduces basic aspects of life contingencies. The theory is illustrated by worked examples and reinforced through numerous exercises. Prepares students to take the relevant actuarial exam. *Prereq. MTH U481 is recommended.*

MTH U677, MTH U678, MTH U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MTH U725 Applied Mathematics Capstone 4 SH
Offers students of mathematics the experience of utilizing their skills to study problems that arise in industry and other “real world” settings. Provides students the opportunity to build on exciting industrial experiences they may have had through co-op or other employment. Fulfills the Arts and Sciences experiential education requirement, and is intended for juniors and seniors with some experience or interest in applications of mathematics. *Prereq. Two years of calculus and junior or senior standing.*

MTH U790 Actuarial Practice 4 SH
Prepares students for the first actuarial exam by covering material omitted from MTH U481, and by practice with actual exam questions. Introduces utility and risk theory. Students submit a major project analyzing data from their co-op experience or from current actuarial, financial, or health-care policy literature. *Prereq. MTH U481 and MTH U581 is recommended.*

MTH U921 Directed Study 1 SH
MTH U922 Directed Study 2 SH
MTH U923 Directed Study 3 SH
MTH U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

MTH U951 Experiential Education Directed Study 4 SH
Draws upon the student’s approved experiential activity and integrates it with study in the academic major. Restricted to those junior and senior mathematics majors who are using it to fulfill their experiential education requirement; for these students it may count as a mathematics elective, subject to approval by instructor and adviser. *Prereq. Math major with junior or senior standing.*

MTH U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student’s major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

MTH U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student’s major field. Culminating experience in the University Honors Program. *Prereq. MTH U970 and honors program participation.*

MUSIC

COLLEGE OF ARTS AND SCIENCES

MUS U100 College: An Introduction 1 SH
Intended for freshmen in the College of Arts and Sciences. Introduces freshmen to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

MUS U101 Introduction to Music 4 SH
Offers an introduction to selected works of our Western musical heritage, from earliest to contemporary styles. Consists primarily of a survey and listening format, with emphasis on styles, basic theory, forms, and the historical, social, and artistic periods that these works represent.

MUS U102 Music as a Listening Experience 4 SH
Offers a self-paced, computer-mediated, Internet-communicated introduction to music course. Offers students the opportunity to listen to classical music. No previous musical knowledge is required or assumed. Draws all musical examples from the masterworks of Western classical music. No classes are scheduled for this course and all learning takes place at a computer, either in one of the on-campus computer labs or at any other location.

MUS U103 Music as a Social Expression 4 SH
Examines the processes of music making and the perceptions of music’s functions in our culture. Considers how music is made, what music means, what kind of music is made, and what music is made to be meaningful. Identifies styles and genres of music and examines them within an ever-shifting context of aesthetics, social history, and cultural change.

MUS U104 Survey of African-American Music 4 SH
Explores the various musical traditions of African Americans, with a specific focus on the United States. Examines the impact of African, European, and Native American traditions

on African-American music as well as the role of music as an expression of African-American aesthetics, traditions, and life. Considers historical and contemporary forms of African-American music, with selected video presentations of musical styles.

MUS U105 Music of the USA 4 SH
Examines American music from the time of Puritan psalm singing to the present. Covers a wide variety of music including concert music, traditional folk music, jazz, and contemporary styles.

MUS U106 Women in Music 4 SH
Examines the multifaceted role of women in music from the Renaissance to the present. Discusses the fact that for centuries women have been active and influential patrons, composers, teachers, conductors, and performers in Europe and the United States. Examines their contributions to classical and popular music and to jazz, with emphasis on such widely varying figures as Elizabeth Jacquet de la Guerre, Fanny Mendelssohn Hensel, Clara Schumann, Amy Beach, Germaine Tailleferre, Billie Holiday, Carla Bley, Ruth Crawford Seeger, Pauline Oliveros, Sarah Caldwell, Antonia Brico, and Nadia Boulanger.

MUS U107 Introduction to Opera 4 SH
Offers a historical, social, political, economic, and artistic overview of the evolution of opera from its beginnings to the present day. Examines basic musical concepts (harmony, melody, and orchestration), structures of opera (aria, ensemble, and recitative), vocal categories and schools, and the relationship between literature, history, and librettos. Offers close study of selected operas in various styles (bel canto, verismo, and so on) by Mozart, Rossini, Verdi, Puccini, Tchaikovsky, Wagner, and others.

MUS U108 Music and Poetry 4 SH
Examines the art of setting words to music. Confronts the aesthetic problems encountered in a synthesis of two different art forms. Examines that synthesis in selected songs, choral works, tone poems, and operas of diverse periods and styles (classical, folk, and popular).

MUS U109 Introduction to Art, Drama, and Music 4 SH
Offers an interdisciplinary approach to music and other arts including painting, film, and theatre. Examines works of art from various periods in the context of the cultures that produced them. Supplements regular classes with visits to art museums or attendance at concerts and theatrical performances.

MUS U110 Music in Popular Culture 4 SH
Explores the nature of music composed for the mass market. Discusses techniques of recording and merchandising music. Selected songs are analyzed for their musical content. Traces the evolution of various styles including ragtime, jazz, blues, rock, and music for the media.

MUS U111 Rock Music 4 SH
Examines the development of rock-and-roll and its relationship to blues, rhythm and blues, country, folk, and other styles of music. Considers themes such as the role of rock as youth music, the reflections of social realities in rock songs, the relationship of rock to the recording industry and the mass media, and the changing styles of rock. Emphasizes listening skills.

MUS U112 Jazz 4 SH
Examines the evolution of the creative improvisational musical styles commonly called jazz, from its African-American roots to its status as one of America's classical musics and an internationally valued art form. Explores the contributions of African and European musical traditions and African-American spirituals, work songs, and blues. Examines major contributors and stylistic development and change through selected audio and audio-visual presentations. Also considers the sociocultural dynamics that have affected musical evolution and acceptance.

MUS U113 Film Music 4 SH
Surveys the use of music in film and video and gives an overview of the mechanics of synchronization and the psychological implications of applying music to film. Analyzes specific dramatic situations, followed by discussion of such scoring techniques as click tracks and picture recording. Studies films such as *The Informer*, *Alexander Nevsky*, *Citizen Kane*, *Forbidden Planet*, *Woman in the Dunes*, and *Tron*. Discusses the works and careers of specific film composers such as David Raksin, Aaron Copland, Jerry Goldsmith, Sergei Prokofiev, and John Williams.

MUS U114 Mozart 4 SH
Traces Mozart's musical development from child prodigy to mature artist through personal letters and biographies. Analyzes many of his major compositions including symphonies, concertos, operas, and chamber works.

MUS U115 Debussy and the Music of Paris 4 SH
Recognizes that Claude Debussy, impressionist in sound, composed music that marked a turning point toward modern trends. Covers much of his music for piano, orchestra, and voice, including *Suite Pour le Piano*, *Suite Bergamasque*, *Images* (for piano and orchestra), *Nocturnes*, *La Mer*, and *Pelleas et Melisande*. Discusses the music of Satie, Ravel, and Fauré as it relates to that of Debussy.

MUS U116 Beethoven 4 SH
Analyzes the complex personality and art of Beethoven, his relation to the turbulent times in which he lived, and his role in classical and romantic music.

MUS U117 George Gershwin 4 SH
Studies the life and works of George Gershwin (1898–1937) including popular song, musical comedy, opera, and orchestral compositions. Explores the relationship of George Gershwin to his times, both musically and historically. Takes as a critical starting point Gershwin's famous statement, "My people are American; my time is today."

- MUS U118 Music Therapy 1 4 SH
Examines the application of music as a therapeutic vehicle to release suppressed emotions, to encourage self-expression in psychiatric patients, and to treat a wide variety of disorders. Examines music therapy, in a modern approach to health services, as a supplement to other treatments.
- MUS U120 Sound Health 4 SH
Gives both musicians and non-musicians the opportunity to experience a heightened awareness of the power of music to effect physical and emotional change. Examines the effects of music on the body, mind, and spirit. Begins with an exploration into the awareness of sound and the physiological changes in the body caused by music, and moves through a variety of theories and techniques used to facilitate positive change, relaxation, and reduction of stress. Also considers sound pollution, the effects of vibrations on the body, guided imagery, music and meditation, and new-age environmental music.
- MUS U121 Medieval and Renaissance Music 4 SH
Offers an introduction to European music from the sixth through the sixteenth centuries. Covers a wide variety of music, ranging from the serene elegance of sacred Gregorian chant and the plaintive love songs of the medieval troubadours to the lively dances and humanistic vocal music of the Renaissance. Examines representative works by composers such as Machaut, Landini, Josquin, Palestrina, and Dowland.
- MUS U122 Music of the Baroque Era 4 SH
Focuses on music of the seventeenth and early eighteenth centuries in Italy, Germany, France, and England. Discusses the emergence of important new genres (such as opera, sonata, and concerto) and examines representative works of major composers (such as Bach, Handel, Corelli, Vivaldi, Rameau, and Purcell).
- MUS U123 Music of the Classical Era 4 SH
Focuses on crucial developments in musical styles and forms of the late eighteenth century and on emerging genres, such as the symphony, the concerto, and the string quartet. Emphasizes the vocal and instrumental works of Haydn and Mozart and the early works of Beethoven.
- MUS U124 Music of the Romantic Era 4 SH
Focuses on romantic realism and idealism as expressed in the music of the nineteenth century. Emphasizes historical, nationalistic, and literary influences. Includes composers such as Beethoven, Schumann, Schubert, Berlioz, Liszt, Verdi, Wagner, Brahms, Tchaikovsky, and Mahler.
- MUS U125 Twentieth-Century Music 4 SH
Focuses on developments in music from 1900 to 2000. Examines a broad range of musical styles including expressionism, neoclassicism, and other major trends in music of the twentieth century.
- MUS U126 New Directions in Music 4 SH
Recognizes that music from 1950 to the present has changed more radically than during any other era in history. Examines new elements in classical and popular music and focuses on the relationship between the two styles.
- MUS U127 Introduction to World Music 4 SH
Introduces musical traditions from around the world using ethnomusicological approaches to examine the role of music in culture. Focuses on various world music from the perspectives of the people who create the music and compares these perspectives with our own.
- MUS U128 Music of Africa 4 SH
Surveys various African musical traditions with respect to their historical, social, and cultural heritage. Examines traditional and contemporary African music, instruments, and performance traditions.
- MUS U129 Music of the Middle East 4 SH
Presents an introduction to the music of selected Near Eastern and Arab cultures (such as Persian in the East and Ethiopic and Berber in Africa). Includes the cantillation styles and practices of various chants of the Hebrew, Christian, and Islamic traditions.
- MUS U130 Music of Asia 4 SH
Introduces the student to the musical heritage of Asia by examining music history, the relationship of music cultures to each other, the organization of musical sounds, and music as an aspect of culture. Emphasizes the development of basic listening skills.
- MUS U131 Music of Latin America and the Caribbean 4 SH
Examines the highly diverse and unique musical practices of South America, Latin America, and the Caribbean. Focuses on the traditions of native, African, and European heritage in these geographical areas. Provides exposure to musical repertoires, ideas about music, the relationship of music to culture, musical instruments, musical contexts, and musical syncretism.
- MUS U132 Music of the Jewish People 4 SH
Investigates the role that music has played in Jewish life from ancient to modern times. Topics include music in the time of the Bible, rabbinic attitudes toward music, music and mysticism, the development of the modes for prayer and scriptural cantillation, church and synagogue music compared, music of the holidays and the life cycle, folk and popular music in the Diaspora, the development of art music in the modern era, and music in modern Israel. Prior knowledge of music is not required.
- MUS U133 Voice Class 4 SH
Gives students the opportunity to learn the basic vocal production required for fine singing. Chooses repertoire, both classical and contemporary, for each student to learn and perform in lessons and before the entire class. Topics include

diction, the physiology of singing, resonance, registers, and interpretation. Also studies the basics of music reading and sight-singing. Discusses some interpretation, and plays recordings of the greatest vocal artists for class analysis.

Prereq. Permission of instructor.

MUS U134 Guitar Class 4 SH
Provides an introduction to the fundamentals of classical guitar playing for those with or without prior knowledge of the guitar. Covers music reading and theory. Requires students to perform alone and in ensemble with other members of the class. Augments the syllabus by live performances from outside professional and student classical guitarists. Bases final grades on several written examinations and student performance.

MUS U201 Music Theory 1 4 SH
Introduces melodic and harmonic practices in tonal music with additional work in chord and melody construction. Develops ear-training and sight-singing skills.

MUS U202 Music Theory 2 4 SH
Continues MUS U201. Focuses on harmonic practices in tonal music. Examines the role and function of harmony through analysis of musical examples and composition of four-voice chorales. Introduces study of advanced harmony. Further develops ear-training and sight-singing skills. *Prereq. MUS U201.*

MUS U203 Music Theory for Music Industry 1 4 SH
Provides basic instruction in reading and writing music. Introduces melodic and harmonic practices, concentrating in popular music styles. Develops ear-training and sight-singing skills.

MUS U204 Music Theory for Music Industry 2 4 SH
Continues MUS U203. Examines the role and function of various musical elements through analysis of examples from popular music. Examines structure, lyrics, and instrumentation in popular music. Further develops ear-training and sight-singing skills. *Prereq. MUS U203.*

MUS U205 Piano Class 1 4 SH
Provides introductory-level study of piano designed for students with or without previous experience. Combines skills in reading music with improvisation and functional piano. Introduces some basic theory to help clarify the structure of class repertoire. Allows students to progress at their own pace. Determines grades by the amount of repertoire mastered during the semester.

MUS U208 Jazz Improvisation 4 SH
Focuses on repertory as well as performance. Examines the great improvisational artists in American music, such as Charlie Parker, Miles Davis, and John Coltrane. Approaches analysis from a theoretical as well as a practical perspective. Explores the use of rhythm, chords, scales, and modes in the creative improvisation process.

MUS U209 Conducting 4 SH
Provides instruction in the basic gestures used in conducting vocal and instrumental ensembles. Topics include beat patterns, conveying phrasing and articulation, cueing, controlling tempo and dynamics, score study, and rehearsal techniques. Provides an opportunity for students to constitute a laboratory ensemble for regular practicum.

MUS U220 Music and Technology 1 4 SH
Provides students with training in the use of a computer for numerous music applications including music transcription and notation, sequencing, orchestration, sound design, and computer-assisted instruction. Students undertake various projects in each of these areas to prepare themselves for the computer-related components of courses throughout their music curriculum. *Prereq. Restricted to music majors and MMS dual majors only.*

MUS U221 Music and Technology 2 4 SH
Continues MUS U220. Presents advanced topics related to music composition with computers. Emphasizes the completion of original music works that employ various methods of sound synthesis, such as additive synthesis, frequency modulation, subtractive synthesis, physical modeling, resynthesis, and MIDI. Students use both hardware and software production tools for the completion of these works. *Prereq. MUS U220.*

MUS U230 Music Industry 1 4 SH
Examines business-related areas of the music industry. Topics include music publishing, copyright, the function of performing rights organizations (ASCAP and BMI), talent agents, artist management, concert promotion, and royalties and contracts.

MUS U231 Music Industry 2 4 SH
Continues MUS U230. Topics include the music products industry, theatrical production, arts administration, the recording industry, music in broadcasting, music in advertising, and royalties and contracts. *Prereq. MUS U230.*

MUS U232 Music Recording 1 4 SH
Introduces the history and practice of recording music. Covers recording apparatus; microphones; monophonic, stereophonic, and digital theory and techniques; field recording; studio terminology; basic sound theory; and development of rudimentary editing skills. Also examines the role of the producer vs. that of the technician, preparation for recording sessions, and basic legal regulations regarding copyrights and compensation.

MUS U233 Music Production for Radio and Web 4 SH
Introduces core skills required for production of music programs for radio and the Web. Instructs students in technical, contextual, and compositional aspects including transmission chains and signal processing, audience targeting using Modal techniques and music demographic analysis, talent selection, and program clock structuring. Discusses emerging techniques relevant to music production for the Web.

- MUS U277, MUS U278, MUS U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- MUS U303 Music Theory 3 4 SH
Continues MUS U202. Examines representative examples of structural principles governing the melodic, harmonic, rhythmic, and formal components of music. Focuses on music from the sixteenth to the mid-nineteenth centuries. Further develops ear-training and sight-singing skills. *Prereq. MUS U202.*
- MUS U304 Music Theory 4 4 SH
Continues MUS U303. Examines works from the late nineteenth century to the present. Includes selected readings by prominent twentieth-century theorists. Further develops ear-training and sight-singing skills. *Prereq. MUS U303.*
- MUS U305 Piano Class 2 4 SH
Continues MUS U205. Emphasizes increasing students' flexibility at the keyboard through the study of scales, transposition, and modulation. *Prereq. MUS U205.*
- MUS U306 Diction for Singers 4 SH
Designed for singers as well as students interested in acting and public speaking. Students receive instruction in the IPA (International Phonetic Alphabet) and the rules of formal English diction.
- MUS U307 Sight-Singing 4 SH
Offers students the opportunity to learn how to read music at sight without the aid of a musical instrument, an essential skill for every musician. Emphasizes mastery of the skills of rhythm reading, as well as solfège and triad recognition in all diatonic keys, through class instruction and daily practice. *Prereq. MUS U201 or MUS U203.*
- MUS U308 Principles of Music Literature 4 SH
Examines the evolution and application of each major structural element of music through a historical perspective. Also links larger categories of music such as classical, popular, and non-Western by examining their common elements. *Prereq. MUS U201 or MUS U203.*
- MUS U311 Historical Traditions 1: America 4 SH
Provides an overview of music in the United States in cultural and stylistic contexts. Introduces historical methods of music. Studies a broad range of styles including folk, popular, and classical music. *Prereq. MUS U308.*
- MUS U312 Historical Traditions 2: Classical 4 SH
Provides an overview of eighteenth-, nineteenth-, and early twentieth-century Western music in cultural and stylistic contexts. Covers some of the best-known figures in classical music: Bach, Mozart, Beethoven, Wagner, and Stravinsky. Considers why and how the great tradition of tonal music defines classical music even today. Uses scores to help understand the different ways music can be written and the different aesthetic definitions of beauty, pleasure, and meaning in sound. *Prereq. MUS U308.*
- MUS U313 Historical Traditions 3: World 4 SH
Examines the historical musical traditions of selected music-cultures of Africa, Asia, Oceania, and indigenous cultures of the Americas. Provides an in-depth study of the evolution of the selected music-cultures, focusing on the following: ethnomusicological historical approaches to the study of music-cultures including music and the belief system, aesthetics, context for music, repertoires, organization of musical sound, instruments and performance techniques, and learning and transmission of musical knowledge (performance and non-performance). Explores why music is different among the world's peoples; what music of the past sounded like and its impact on how music sounds today; what happens to music over time and space; and why music should be preserved and by whom. *Prereq. MUS U308.*
- MUS U315 History of Electronic Music 4 SH
Exposes students to the history of electronic music from its conception in the late 1800s to the present day. Requires extensive listening and analysis of representative works to ensure students have the opportunity to acquire a clear understanding of the music in question. Studies technical innovations that affected the creation of electronic compositions. *Prereq. MUS U221.*
- MUS U318 Music Therapy 2 4 SH
Continues MUS U118. Examines the etiologies, characteristics, and applications of music therapy with the physically handicapped, hearing impaired, visually impaired, learning disabled, emotionally disturbed, speech/language impaired, and geriatric populations in one-to-one and group settings. Also studies improvisations and appropriate music materials for the non-musician and adapted instrument designs tailored to each disability, while exploring the correlation of music and movement. Compares various musical therapy approaches. *Prereq. MUS U118.*
- MUS U320 Sound Design 4 SH
Instructs students in the art of producing and designing musical accompaniments for a variety of media including film, TV commercials, industrial video, animation, games, theatre, and radio drama. Focuses on abstract thinking regarding sound theory and practice and includes hands-on skills. *Prereq. MUS U221.*
- MUS U330 Music Administration 4 SH
Introduces music management including the structure of nonprofit organizations (such as arts service organizations, arts centers, symphony orchestras, chamber orchestras, ensembles, opera companies, and university arts programs) and the structure of for-profit enterprises. Examines financial management, funding, and audience development. *Prereq. MUS U231.*

MUS U331 Music Recording 2	4 SH	student's primary instrumental or vocal instructor. Minirecitals are usually shared by more than one student. Students take MUS U410 in place of MUS U921.
Offers students the opportunity to learn additional skills in the recording process such as material marketing and distribution, contracts and negotiations, and establishing distribution channels. Includes hands-on studio production of record-quality material. <i>Prereq. MUS U232.</i>		
MUS U332 Artist Management	4 SH	MUS U420 Music Composition
Provides an in-depth investigation of the field of musical artist management. Explores the artist-manager relationship, the management contract, artist evaluation, image formulation, the artist's development team, achieving a recording contract, merchandising, endorsements, sponsorships, touring, and financial management. <i>Prereq. MUS U231.</i>		4 SH
		Exposes students to the basic methods of music composition. Analyzes examples from music literature to gain an understanding of the methods employed; students complete several compositions of their own. <i>Prereq. MUS U303.</i>
MUS U333 The Record Industry	4 SH	MUS U470 War and Music
Examines the domestic and international record industry. Topics include industry structure, business and legal affairs, the recording contract, royalties, manufacturing, distribution, promotion, publicity, advertising, licensing, and piracy. Offers students the opportunity to explore major record labels and independent labels. Addresses the past, present, and future. <i>Prereq. MUS U231.</i>		4 SH
		Offers an interdisciplinary and comparative exploration of the diverse ways in which composers, artists, novelists, poets, and dramatists have depicted the excitement, glory, agony, and sacrifice of war both at the dawn of modern gunpowder-based warfare in the seventeenth and eighteenth centuries, and as the full impacts of "industrialized killing" became visible in the twentieth. Drawing on artistic and literary artifacts and the massive cultural outpourings that the slaughter and destruction of the two world wars of the twentieth century elicited, students will investigate how artists' interactions with the experience and meaning(s) of war have developed and changed in the modern world and how those changes have affected our own understanding of its impact and significance. <i>Prereq. Permission of instructor.</i>
MUS U334 Music Merchandising	4 SH	MUS U477, MUS U478, MUS U479
Provides a thorough examination of business organization, marketing, distribution, and sales techniques in the diverse field of the music products industry. Investigates market sectors such as musical instruments; professional, semiprofessional, and home audio equipment; the recording industry; and print music. <i>Prereq. MUS U231.</i>		1 SH each
		Honors Adjunct
		Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>
MUS U335 Copyright Law for Musicians	4 SH	MUS U520 Interactive Real-Time Performance
Explores the unique character of music-related copyright issues. Investigates common law copyright; statutory copyright; ownership, duration, and transfer of copyright; fair use; works for hire; infringements and remedies; public domain works; and international copyright. Also examines related legal aspects of the music industry. <i>Prereq. MUS U231.</i>		4 SH
		Focuses on three high-end skills: advanced software-based synthesis and production, abstract reasoning and computer programming, and performing live with electronic instruments in an interactive human-computer environment. Utilizes the MAX programming language, enhanced with MSP, a set of extensions to the MAX graphical programming environment that provides for real-time synthesis and signal processing with a PowerPC Mac OS computer. <i>Prereq. MUS U320.</i>
MUS U336 Computer Applications in Music Business	4 SH	MUS U550 Historical Traditions 4: Special Topics
Uses state-of-the-art computer applications in an advanced exploration of the business of music. Investigates computer applications in the record industry, artist management, arts administration, the music products industry, and music publishing. <i>Prereq. MUS U231.</i>		4 SH
		Provides an advanced seminar examining topics and issues surrounding musical cultures and histories. Topics vary with each offering. <i>Prereq. MUS U308.</i>
MUS U337 Writing about Music	4 SH	MUS U551 Special Topics in Music Technology
Provides an overview of various types of musical journalism including criticism, reviews, feature articles, program notes, promotional material, and so on. Offers students significant opportunity to develop their own skills in writing, editing, research, and interview techniques as they apply to writing about music and the music industry. <i>Prereq. MUS U231.</i>		4 SH
		Focuses on topics related to current trends in the area of music technology. Topics vary with each offering. <i>Prereq. MUS U221.</i>
MUS U410 Recital 1	4 SH	MUS U601 Seminar in Music Industry
Offers preparation for and performance of a mini-recital (twenty to thirty minutes of music) under the guidance of the		4 SH
		Presents a capstone course for music industry students. Offers advanced students the opportunity to explore contemporary events and issues in the music industry. Allows students to reflect upon, distill, and apply knowledge accumulated in prior courses and previous experiential learning. This reflection and

application occurs through substantial writing assignments and classroom discussion. Fulfills the college's experiential education requirement for music industry majors. *Prereq. MUS U231 and senior standing.*

MUS U611 Composition for Electronic Instruments 4 SH
Instructs in the composition of original music for various media. Students undertake projects to create music to accompany video, animation, and film, and they also learn suitable methods for creating original music for the Internet. Another component of the class deals with electronic music in concert performance. Covers numerous examples of existing music written for similar contexts and evaluates these examples for their suitability to the task. Also prepares students for their required senior recital. Fulfills the college's experiential education requirement for music technology majors. *Prereq. MUS U320 and senior standing.*

MUS U621 Seminar in Performance Practice 4 SH
Provides students with the opportunity to reflect on their research as it applies to their performances. Students present written reports to be discussed at the seminar. Students are also expected to research and write the program notes for their performances. Fulfills the college's experiential education requirement for literature and performance majors. *Prereq. MUS U311 and junior or senior standing.*

MUS U622 Recital 2 4 SH
Offers preparation for and performance of a senior recital (forty to sixty minutes of music) under the guidance of the student's primary instrumental or vocal instructor. *Prereq. Senior standing.*

MUS U677, MUS U678, MUS U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

MUS U699 Advanced Television Production 4 SH
Provides students with guidance in the development of special projects in television and video production. Studies include advanced directing (studio and field), lighting, scriptwriting, editing, graphics, and postproduction technology.

MUS U901 Music Lessons 1 1 SH
MUS U902 Music Lessons 2 1 SH
Offers private instruction in voice or in an instrument. Arranges weekly lessons on a half-hour basis. Contact the music department for arrangements. Requires lab fee.

MUS U903 Composition Lessons 1 SH
Offers private instruction in music composition. Contact the music department for arrangements. Requires lab fee.

MUS U904 Chorus 1 SH
Allows students to participate as performers in one or more ensembles under the direction of a faculty conductor.

MUS U905 Band 1 SH
Allows students to participate as performers in one or more ensembles under the direction of a faculty conductor.

MUS U906 Orchestra 1 SH
Allows students to participate as performers in one or more ensembles under the direction of a faculty conductor.

MUS U911 Jazz Ensemble 1 SH
Designed to serve both music majors and non-majors, this is a performance/theory/history offering of the varied styles and techniques of performance in the jazz tradition of African-American music. Students are drawn from all segments of the University. Repertory is taken from the standard jazz literature as well as investigations of new works. Improvisational and interpretational techniques are the core content of the course. Both the NU Jazz Ensemble and the NU Jazz Combo are represented together in this course.

MUS U912 Rock Ensemble 1 SH
Allows students to participate as performers in one or more ensembles under the direction of a faculty conductor.

MUS U913 Blues/Rock Ensemble 1 SH
Allows students to participate as performers in one or more ensembles under the direction of a faculty conductor.

MUS U914 Create Your Own Music 1 SH
Allows students to participate as performers in one or more ensembles under the direction of a faculty conductor.

MUS U915 Chamber Ensembles 1 SH
Allows students to participate as performers in one or more ensembles under the direction of a faculty conductor.

MUS U921 Directed Study 1 SH

MUS U922 Directed Study 2 SH

MUS U923 Directed Study 3 SH

MUS U924 Directed Study 4 SH

Focuses on independent work in a selected area of music under the direction of a member of the department. Enrollment is limited to qualified students by special arrangement with the supervising faculty member and with the approval of the department chair. *Prereq. Permission of instructor.*

MUS U951 Experiential Education Directed Study 4 SH
Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement.

MUS U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

MUS U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. MUS U970 and honors program participation.*

NAVY ROTC

NAV U001 Naval Science Laboratory 0 SH
 Focuses on either drill instruction or practical work to complement classroom instruction. Must be taken in each class semester by all NROTC nursing students.

NAV U101 Introduction to Naval Science 3 SH
 Presents a general introduction to the naval profession and the concepts of sea power. Emphasizes the mission, organization, and warfare components of the United States Navy and Marine Corps. Includes an overview of officer and enlisted ranks and rates, training and education, and career patterns. Also covers naval courtesy and customs, military justice, leadership, and nomenclature. Exposes the student to the professional competencies required to become a naval officer.

NAV U202 U.S. Naval History 3 SH
 Surveys United States naval history from the American Revolution to the present with emphasis on major developments. Includes an in-depth discussion of the geopolitical theory of Mahan. Also treats present-day concerns in sea power and maritime affairs including the economic and political issues of merchant marine commerce, the law of the sea, the Russian navy and merchant marine, and a comparison of United States and Russian naval strengths.

NAV U501 Leadership and Management 3 SH
 Studies at an advanced level organizational behavior and management in the context of the naval organization. Topics include the management functions of planning, organizing, and controlling; individual and group behavior in organization; and motivation and leadership. Explores major behavioral theories in detail. Investigates practical applications by the use of experiential exercises, case studies, and lab discussions. Develops other topics including decision making, communication, responsibility, authority, and accountability.

NAV U702 Leadership and Ethics 3 SH
 Provides a foundation of leadership principles and management tools and skills to prepare and motivate students to assume the responsibilities of a commissioned officer in the United States Navy confidently. Reinforces leadership principles through leadership case studies with emphasis on core values, responsibility, accountability, loyalty, and professional ethics. Provides a basic background in the responsibilities of a junior division officer and watch officer, with emphasis on training, counseling, career development, military law, and special programs. This is the capstone course of Naval Science.

NURSING

BOUVÉ COLLEGE OF HEALTH SCIENCES

NUR U101 Nurses as Caregivers 3 SH
 Introduces students to contemporary professional nursing. Introduces the concepts of a wellness program as well as the nursing process as the framework for nursing practice. Topics include activities of daily living, principles of communication and teaching, and learning. In the nursing lab students practice basic skills related to self-care and hygiene, safety, nutrition, elimination, and mobility. Clinical experiences in the community emphasize the themes of health promotion and cultural-sensitive care and include the opportunity to complete a teaching and learning plan. *Coreq. NUR U102.*

NUR U102 Lab for NUR U101 0 SH
 Accompanies NUR U101. Covers topics from the course through various activities. *Coreq. NUR U101.*

NUR U103 Assessment Across the Life Cycle 5 SH
 Emphasizes the dimensions of collecting data relevant to health status across the life span. Provides an opportunity to use tools and skills of health assessment. Discusses ethnic, cultural, spiritual, social, psychological, development, gender, and physical aspects of health assessment. Explores formulation nursing diagnosis and examines the relationship of the nursing-care plan to the overall resources of the client. Explores the professional nursing role in the context of the nursing diagnosis and observes the relationship of the nursing-care plan to overall resources of the client. Examines the professional nursing role in the context of the student's developing self-awareness and personal goals. Includes practicing skills in the nursing laboratory. *Coreq. NUR U104. Prereq. BIO U117.*

NUR U104 Lab for NUR U103 0 SH
 Accompanies NUR U103. Covers topics from the course through various activities. *Coreq. NUR U103.*

NUR U200 Nursing as a Practice-Based Profession 5 SH
 Examines the role of the professional nurse in promoting healthy children and adults through concepts of human development of individual, family, and community. Clinical experiences in the community and long-term-care settings extend the health promotion to families and assist students in identifying potential alterations in function and their impact on daily family life, and the appropriate use and evaluation of nursing interventions. In the nursing lab students practice basic skills related to the administration of medications and fluid and electrolyte balance. *Coreq. NUR U201. Prereq. NUR U101 and BIO U117.*

NUR U201 Lab for NUR U200 0 SH
 Accompanies NUR U200. Covers topics from the course through various activities. *Coreq. NUR U200.*

NUR U205 Wellness	4 SH	Explores the concept of wellness; examines behaviors and lifestyle choices that lead to a high level of physical, emotional, and spiritual well-being. Topics include health risk, behavioral change, lifestyle analysis, the life cycle, and stress management through self-analysis.	with health problems. Analyzes the client's health-care needs and the resources to meet them, in collaboration with the client and health providers. Discusses ethical and legal dimensions of nursing care of adults. Emphasizes discharge planning and teaching. Includes clinical learning experiences in a variety of settings. <i>Coreq. NUR U307 and NUR U310. Prereq. NUR U302.</i>		
NUR U210 Influences on Health and Illness	3 SH	Enables the student to understand the values that underlie health-seeking behavior and the provision of care. Uses value clarification to appreciate an individual's rights and responsibilities vs. the common good. Examines cultural differences in light of individual and group behavior, as well as life span issues and family and group responsibilities. Helps students to build a caring ethic and a sense of professional responsibility through self-examination.	NUR U307 Lab for NUR U306	0 SH	Accompanies NUR U306. Covers topics from the course through various activities. <i>Coreq. NUR U306.</i>
NUR U277, NUR U278, NUR U279	1 SH each	Honors Adjunct Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	NUR U310 Nursing Adults in the Community	2 SH	Emphasizes the promotion of health in adults and includes common health problems of adults at critical life stages, from the young adult to the frail, elderly years. Analyzes potential and actual health-risk factors and the discovery of risk-reduction strategies by applying the nursing process to the care of adults living within families and communities. Enables students to use health education and teaching methods in assessing and intervening therapeutically to meet the primary health-care needs of adults. Assesses the role of the nurse in partnership with the family and community in disease prevention. Includes clinical learning experiences in a variety of settings. <i>Coreq. NUR U306 and NUR U311. Prereq. NUR U302.</i>
NUR U300 Pathophysiology	3 SH	Reviews human physiology related to oxygenation, nutrition, elimination, protective mechanisms, neurological functions, endocrine functions, and skin integrity. Explores how the human body uses its adaptive powers to maintain equilibrium and how alterations affect normal processes. Examines disease processes and implications for nursing practice. <i>Prereq. BIO U119.</i>	NUR U311 Lab for NUR U310	0 SH	Accompanies NUR U310. Covers topics from the course through various activities. <i>Coreq. NUR U310.</i>
NUR U302 Nursing with Women and Families	5 SH	Emphasizes the promotion of health for women and their families. Self-care and empowerment are an integral focus in examining women's health from a developmental perspective. The nursing process provides the framework for students to assess and intervene therapeutically in promoting healthy childbearing and the health of the woman during the life span. Emphasis is placed on caregiving of the woman, the fetus, and the infant within the family environment. Concepts of human development of individual, family, and community form the context in examining the caregiving role of the professional nurse. Discusses the effects of cultural, social, economic, and ethical influences and the impact of health-care technology. <i>Coreq. NUR U303. Prereq. NUR U103, NUR U200, and BHS U105.</i>	NUR U400 Nursing and the Promotion of Mental Health	5 SH	Focuses on primary, secondary, and tertiary prevention as it relates to individuals with mental health issues. Incorporates principles of communication, with particular focus on individuals with altered patterns of communication. Helps students provide nursing care to individuals, families, and groups with a variety of mental health and mental illness-related issues. Provides students information about the spectrum of mental illnesses and about factors that predispose people to developing mental health problems. Critical thinking skills are employed to explore the legal and ethical issues of providing nursing care for mentally ill persons. Use of psychotropic drugs is integrated throughout the course as it applies to specific psychiatric illnesses. Inpatient and community settings are utilized as learning arenas to assist students to meet the course objectives. <i>Coreq. NUR U401. Prereq. NUR U200.</i>
NUR U303 Lab for NUR U302	0 SH	Accompanies NUR U302. Covers topics from the course through various activities. <i>Coreq. NUR U302.</i>	NUR U401 Lab for NUR U400	0 SH	Accompanies NUR U400. Covers topics from the course through various activities. <i>Coreq. NUR U400.</i>
NUR U306 Nursing with Acutely Ill Adults and Families	8 SH	Focuses on the therapeutic nursing interventions used to restore health to adults who are experiencing acute and/or complex health problems. Analyzes deviations from health with attention to the implications for the individual and the family in coping	NUR U477, NUR U478, NUR U479	1 SH each	Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>

<p>NUR U500 Nursing with Acutely Ill Children and Families 5 SH Builds upon knowledge of normal growth and development, and the health needs of the well child to examine the impact of acute illness on the adaptation of children and their families. Emphasizes nursing strategies of caregiving that maximize the return to health of children and their families. Students explore evidenced-based practices within the framework of the nursing process. Clinical experiences in acute-care services for children are integral to the course. Students plan and implement caring interventions for children, including their family members, as appropriate. <i>Coreq. NUR U501 and NUR U510. Prereq. NUR U306.</i></p>	<p>change, motivation, environmental safety, quality improvement, collective bargaining, and conflict resolution—to give students an understanding of the knowledge base for the management role of the baccalaureate nurse. Provides the opportunity to apply principles and practice skills in planning and delegating nursing care using different organizational models and approaches. Discusses the developing creative role for managing and leading in nursing. Includes case-based educational learning experiences and projects. <i>Prereq. Senior standing.</i></p>
<p>NUR U501 Lab for NUR U500 0 SH Accompanies NUR U500. Covers topics from the course through various activities. <i>Coreq. NUR U500.</i></p>	<p>NUR U677, NUR U678, NUR U679 1 SH each Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>
<p>NUR U510 Caregiving: Children across the Continuum 2 SH Focuses on the integration of the range of services available to children and their families in the face of illness, and recovery or the management of chronicity or terminal illness. In a community-based experience, students explore, assess, and use resources that support and foster the health of the community for families requiring various health services. <i>Coreq. NUR U500 and NUR U511. Prereq. NUR U306.</i></p>	<p>NUR U921 Directed Study 1 SH NUR U922 Directed Study 2 SH NUR U923 Directed Study 3 SH NUR U924 Directed Study 4 SH NUR U925 Directed Study 5 SH Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i></p>
<p>NUR U511 Lab for NUR U510 0 SH Accompanies NUR U510. Covers topics from the course through various activities. <i>Coreq. NUR U510.</i></p>	<p>NUR U945 Comprehensive Nursing Practicum 4 SH Helps students to synthesize nursing knowledge, skills, and experience and facilitate their transition to professional nursing practice and case management of clients with complex health problems. Enables students to demonstrate leadership and collaborative skills in working with other members of the health-care team through a weekly eight-hour precepted relationship with a registered nurse. Examines patient-care experiences in weekly seminars. Includes clinical learning experiences in a variety of settings. <i>Prereq. Senior standing.</i></p>
<p>NUR U600 Nursing with Vulnerable Populations 5 SH Analyzes the factors that contribute to vulnerability in selected population groups and the relative costs of prevention. Enables students to understand the value and use of assessment from the point of view of human biology, maturation and aging, physiologic function, physical, psychological, and social environment, and lifestyle. Examines types of community-based strategies to help underserved urban populations. Areas of care include family as client; assessment of communities and target groups; care of older clients; care of the homeless; care of children in school; substance abuse; and violence. Helps students define the role of the community health nurse as a primary-care provider, case manager, deliverer of nursing care, coordinator of care, collaborator, liaison between agencies, and user of nursing research. <i>Coreq. NUR U601. Prereq. NUR U200.</i></p>	<p>NUR U970 Junior/Senior Project 1 4 SH Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i></p>
<p>NUR U601 Lab for NUR U600 0 SH Accompanies NUR U600. Covers topics from the course through various activities. <i>Coreq. NUR U600.</i></p>	<p>NUR U971 Junior/Senior Project 2 4 SH Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. NUR U970 and honors program participation.</i></p>
<p>NUR U610 Managing and Leading in Health Care 3 SH Focuses on the knowledge and skills related to the delivery of health services within a nursing management context. Presents theories, concepts, and models—such as managed care, organization and management, authority, delegation, resource allocation, budgeting, leadership and empowerment,</p>	

PHYSICAL EDUCATION AND DANCE

PED U101 Beginning Swimming 1 SH
Focuses on basic swimming skills for nonswimmers, with emphasis on personal water safety.

PED U106 Beginning Scuba 2 SH
Focuses on basic skin diving and scuba diving skills, with emphasis on safety. Prereq. PED U101.

PED U107 Sailing 1 SH
Focuses on basic skills in sailing. Taught at Community Boathouse. Requires lab fee.

PED U114 Beginning Badminton 1 SH
Focuses on basic badminton strokes, concepts, rules, strategies, and game play.

PED U116 Beginning Tennis 1 SH
Focuses on basic tennis strokes (forehand, backhand, serve, volley, lob, overhead), concepts, rules strategies, and game play.

PED U124 Beginning Fencing 1 SH
Focuses on the fundamental principles and techniques of fencing at the beginner level.

PED U131 Yoga 1 SH
Introduces yoga skills and techniques for men and women at the beginning level.

PED U132 Weight Training 1 SH
Introduces the principles and use of resistive exercises: isotonic exercise (weights), isometric exercise, and the appropriateness of each.

PED U133 Physical Conditioning 1 SH
Focuses on assessing one's personal fitness level, with emphasis on establishing a personal exercise regimen based on scientific principles of training. Utilizes special sections for different mediums of exercise, such as aerobic training, running, weights, and circuit training.

PED U134 Aerobic Exercise and Dance 1 SH
Focuses on aerobic fitness, with strong emphasis on concepts of exercise, safety, and conditioning.

PED U138 Beginning Skiing 1 SH
Focuses on the fundamental techniques of downhill skiing. Requires lab fee.

PED U140 Basketball 1 SH
Focuses on knowledge and skills appropriate for playing basketball at the beginning level.

PED U142 Volleyball 1 SH
Focuses on the knowledge and skills appropriate for playing volleyball at the beginning level.

PED U144 Personal Safety and Self-Defense 1 SH
Designed to introduce the principles and techniques of personal crime prevention. Covers factors that cause crime and the resources available to avoid becoming a victim. Offers students the opportunity to learn personal safety assessment and strategies to make them a less likely target for criminal activity. Course examples focus on safety and security on a college campus.

PED U150 Soccer 1 SH
Focuses on knowledge and skills appropriate to play soccer at the beginning level.

PED U151 Beginning Racquetball 1 SH
Focuses on knowledge and skills appropriate to play racquetball at the beginning level.

PED U153 Modern Dance 1 1 SH
Introduces modern dance technique and style.

PED U156 Ballet 1 1 SH
Introduces ballet fundamentals, with emphasis on alignment.

PED U159 Jazz Dance 1 1 SH
Introduces the fundamentals of jazz dance, with emphasis on alignment. A variety of jazz styles and routines are explored.

PED U163 Ballroom Dance 1 1 SH
Introduces traditional and contemporary partner dancing.

PED U166 Choreography and Performance 1 1 SH
Offers students an opportunity to explore the choreographic process and perform choreography drawn from modern, ballet, and jazz dance repertory. Prereq. Permission of the department.

PED U180 Health and PE in the Elementary School 4 SH
Focuses on introductory knowledge and skills necessary for teaching health and physical education to elementary school children. Emphasizes the importance of the elementary school years for health promotion and positive health behaviors, motor skill development, the implications of health-related fitness, and activities that maximize participation for children in vigorous activity promoting wellness.

PED U181 Health and Motor Development in Early Childhood 4 SH
Focuses on social, cognitive, and physical aspects influencing health and motor development in preschoolers and across the life span. Emphasis is on the importance of the early childhood years for health promotion and positive health behaviors. Studies the development of fundamental motor patterns (walking, running, catching, throwing, striking, climbing, and so on) including perceptual motor implications. Provides an opportunity to work directly with a preschooler in a laboratory setting observing and assessing fundamental motor patterns and behavior.

PED U182 Coaching Youth Sports	4 SH
Attempts to prepare the untrained and inexperienced volunteer to relate better to young athletes ages eight to fourteen. Addresses developing a coaching philosophy; teaching developmentally appropriate motor skills and strategies to young athletes; reinforcing youngsters positively; and planning practices, safety implications, and liability concerns. Stresses providing youngsters with an experience that values sportsmanship and citizenship; teaching young athletes respect for self and others; keeping unwanted behavior out of the program; and training athletes first, winning second.	
PED U301 Intermediate Swimming	1 SH
Focuses on basic and advanced swimming skills, with emphasis on form and efficiency. <i>Prereq. PED U101.</i>	
PED U339 Intermediate Skiing	1 SH
Focuses on downhill skiing including intermediate and advanced techniques. Emphasizes skill development. Snowboarding instruction is an option. Requires lab fee.	
PED U354 Modern Dance 2	1 SH
Continues PED U153 with progression to more complex modern dance techniques and combinations. <i>Prereq. PED U153.</i>	
PED U357 Ballet 2	1 SH
Continues PED U156 with emphasis on further developing lyrical style. <i>Prereq. PED U156.</i>	
PED U360 Jazz Dance 2	1 SH
Continues PED U159 with emphasis on further developing jazz dance style. <i>Prereq. PED U159.</i>	
PED U364 Ballroom Dance 2	1 SH
Continues PED U163 with progression into more complex dance steps, partnering techniques, and amalgamations. Expands upon dances taught in the previous course and introduces additional ballroom dances. <i>Prereq. PED U163.</i>	
PED U367 Choreography and Performance 2	1 SH
Continues PED U166 with progression into more complex dance repertory. Introduces criteria used in the critical evaluation of choreography, and addresses aspects of dance history. <i>Prereq. PED U166.</i>	
PED U555 Modern Dance 3	1 SH
Continues PED U354 with progression into the expressive and choreographic use of modern dance techniques. <i>Prereq. PED U354.</i>	
PED U931 Independent Study 1	1 SH
PED U932 Independent Study 2	2 SH
PED U933 Independent Study 3	3 SH
PED U934 Independent Study 4	4 SH
Offers students the opportunity for concentrated planning and research in a topic area of physical education, sport, or dance. Requires students to submit outline of proposed study.	

PHILOSOPHY AND RELIGION

COLLEGE OF ARTS AND SCIENCES

PHL U100 College: An Introduction	1 SH
Intended for freshmen in the College of Arts and Sciences. Introduces freshmen to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.	
PHL U101 Introduction to Philosophy	4 SH
Introduces students to philosophy by acquainting them with the theories and arguments of classical and contemporary philosophers and by teaching skills of constructing and analyzing arguments. Emphasizes philosophical inquiry. Topics include the basis of morality, free will vs. determinism, the existence of God, the problem of suffering, and the nature of knowledge.	
PHL U103 Women's Studies	4 SH
Overviews an interdisciplinary field that continues to vitalize our understanding of the world theoretically, methodologically, and practically. Seeks to understand and change the gender hierarchies that shape and constrain people's lives. Examines various perspectives on the social construction of gender—what it means socially to be a woman or man—and the ways in which gender is a central organizing principle in our lives. Examines, analyzes, and challenges gender differences, stereotypes, and inequalities. Researchers in the field also inquire into the ways in which women deploy their gender identities to participate in social movements, both political and religious; to address issues of women's health and control over reproduction; as well as to challenge social norms in their roles as writers, artists, and activists.	
PHL U105 Introduction to Scientific Method	4 SH
Offers a philosophical introduction to the scientific world picture. Traces the development of the concepts basic to science from the Greeks to the present century, emphasizing the scope and limits of scientific explanation, the relation of theory and observation, and the relations between the sciences.	
PHL U110 Introduction to Religion	4 SH
Seeks to identify and appraise different ways of being religious: primitive, mystical, dogmatic, and ritual. Emphasizes appreciating the unique standpoint that each requires, how each sees the world in a radically different way, and how that leads to distinctive ways of life.	
PHL U114 Critical Reasoning	4 SH
Introduces the skills and techniques of reasoning, stressing applications to issues in diverse professional, personal, and social contexts.	

- PHL U115 Introduction to Logic 4 SH
Introduces the logic of propositions and the syllogism. Examines principles of critical reasoning and fallacies. Offers practice in applying logical techniques to the creation and criticism of arguments.
- PHL U130 Ethics: East and West 4 SH
Explores claims in both Eastern and Western philosophy that a way of life exists that leads to happiness, power, and wisdom. Focuses on such questions as: Is there a best way to live? Is there a way a human being should live? Studies the thought of such philosophers as Socrates, Buddha, Plato, Aristotle, Lao Tzu, Epictetus, Marcus Aurelius, Aquinas, and Spinoza, as well as studies some of the classical Hindu and Buddhist texts.
- PHL U135 Philosophical Problems of Law and Justice 4 SH
Focuses on general questions about the law: What is the nature and proper scope of the law? How should the law be enforced and are there alternatives to punishment? How can laws be properly interpreted? Examples of legal controversies are related to the theories studied.
- PHL U137 Philosophical Problems of War and Peace 4 SH
Concentrates on ethical and philosophical issues about war and peace. Focuses on the nature and justification of war; moral questions about tactics in war; ideas for avoiding war; concepts of and strategies for attaining peace; and the morality of relations between nations.
- PHL U140 Social and Political Philosophy 4 SH
Focuses on basic questions about the nature of the state and the relationship of individuals to the state. What basis is there for individuals to obey the laws of the state? What conditions must a government meet to be legitimate? What justification can be given for democratic forms of government? Also examines what sorts of controls the state should exert over citizens, and what benefits citizens have a right to expect from the state. Includes readings from both classical and contemporary sources.
- PHL U145 Technology and Human Values 4 SH
Examines the changing values of the modern, technologically advanced world. Attempts to increase our understanding of the supposed breach between the literary and scientific cultures, the diverse approaches toward their reconciliation, and the human dimensions of science and technology. Topics include the neutrality of technology with respect to good or evil uses, technology as an instrument for human liberation, and the issue of proper and effective modes of controlling technology in today's world.
- PHL U150 Understanding the Bible 4 SH
Introduces students to the Old and New Testaments, so that they may enter into a dialogue with the Bible, understanding not only what it says, but why it is said that way. To do this, discussion focuses on the Bible's social, political, and cultural backgrounds.
- PHL U160 Philosophical Problems of Economic Justice 4 SH
Attempts to answer the questions: What is economic justice? What are the criteria by which we tell whether a society is (or is not) an economically just society? Looks at views on these issues developed by advocates of capitalism, socialism, and the welfare state.
- PHL U165 Moral Problems in Medicine 4 SH
Introduces ethical theories and moral principles, and then uses these theories and principles to analyze the moral problems that arise in the medical context. Topics include euthanasia, medical paternalism, informed consent, patient confidentiality, the right to die, the ethics of medical research, abortion, the right to health care, distribution of scarce medical resources, and the ethical implications of health maintenance organizations.
- PHL U170 Business Ethics 4 SH
Examines ethical principles and considerations involved in making moral business decisions. Studies basic ethical viewpoints as a foundation; analyzes specific characteristics of business life through case studies and examples. Topics include corporate responsibility, employee rights, conflict of interest and roles, advertising and information disclosure, environmental issues, and self- and governmental regulations.
- PHL U180 Ecology Ethics 4 SH
Focuses on a current ecological crisis and addresses the values that underlie our concern over this crisis, whether the values at issue are anthropocentric or biocentric. Explores the ethical implications these ecological concerns have for our individual lifestyles, and for our role as members of communities.
- PHL U215 Symbolic Logic 4 SH
Focuses on the syntax and semantics of propositional logic and first-order quantification theory. Considers relations between these systems and natural language. Covers analysis of the notion of derivation within a system, the notion of logical consequence, and practice in analyzing logical structure in natural language sentences.
- PHL U220 The Meaning of Death 4 SH
Offers an inquiry into different philosophical and religious perspectives on death and life after death, including an examination of some powerful contemporary accounts of personal confrontation with death along with investigations into attitudes toward death in other traditions (for example, Hinduism and Buddhism).
- PHL U265 Latin American Religions 4 SH
Explores the major religious traditions of Latin America—indigenous, Christianity, and African—and how they have influenced one another, resulting in the syncretisms and religious cultures of our own day.

- PHL U270 Western Religions 4 SH
Explores how Western religion is grounded in the experience of God's presence, which transcends and transfigures the life of the individual and the community. This encounter is the essence of Judaism, Christianity, and Islam. Drawing on autobiography and biography, this course delves into the personal religious quests of such major religious thinkers as St. Augustine, St. Theresa, Martin Luther, Elie Wiesel, Richard Rubenstein, Dietrich Bonhoeffer, and Mohammed.
- PHL U275 Eastern Religions 4 SH
Focuses on various forms of Hinduism and Buddhism. Begins with Theravada Buddhism, a religion that rests on the insights that everything is impermanent and that it is possible to live fully in the present without any suffering. Explores Hahayana Buddhism and then Taoism, a subtle view that emphasizes the "flow" of life and that "the way to do is to be." Focuses on the Hinduism of the Upanishads. As part of the exploration of this form of Hinduism, students are given the opportunity to examine meditation intellectually and also to practice a few methods of meditation. Also investigates the devotional aspect of Hinduism as expressed in the *Bhagavad-Gita*. Explores Zen Buddhism as well.
- PHL U277, PHL U278, PHL U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- PHL U280 Islam 4 SH
Explores the history of Islam, its conflicts with the West past and present, Islamic beliefs, the future of Islam as a world religion, and relations of Islamic faith. Examines social, political, and legal issues as well as the more familiar religious and theological questions.
- PHL U285 Jewish Religion and Culture 4 SH
Explores the basic features of Judaism in the ancient, rabbinic, and modern periods. Employs an historical critical approach to the formative texts and their interpreters. Analyzes Jewish practices within specific historical contexts and discusses the ways in which practices relate to the texts and history of Judaism. Examines the rich varieties of Jewish cultural expressions.
- PHL U290 Chinese Philosophy and Religion 4 SH
Offers a study of Chinese philosophy as developed in the traditions of Confucianism, Taoism, and the I Ching.
- PHL U295 Religious Perspectives on Health and Healing 4 SH
Explores aspects of the historical, religious, and cultural context for contemporary alternatives in health care, beginning with an examination of several examples of traditional healing practices and their accompanying religious and philosophical views about human life. Explores this "holistic" tradition in two frames of reference: the ascendancy of scientific rationalism over religion; and the takeover, by male-dominated professions, of healing functions that society has traditionally assigned to women (that is, the rise of obstetrics and the suppression of midwifery). Emphasizes major women healers of the nineteenth century. Includes some contemporary efforts at integration of scientific and traditional values in the modern health-care system.
- PHL U316 Interpreting the Bible 4 SH
Offers students the opportunity to understand the Bible as it is continually interpreted by believing communities in their own social and religious contexts. By appreciating the process of scriptural interpretation and the various sources of authority for it, allows us to see contemporary theological conflicts in a broader perspective. *Prereq. PHL U150.*
- PHL U322 Responses to the Holocaust 4 SH
Explores the variety of responses to the mass death brought on by the Holocaust. Examines the responses of theology, literature, as well as relevant ethical issues. *Prereq. One philosophy course.*
- PHL U325 Ancient Philosophy 4 SH
Examines the philosophy of classical Greece. The philosophers considered have distinctive views of the nature of the material world and of the person, so the course covers both metaphysical and moral writings. Texts are primarily from Socrates, Plato, and Aristotle. Some consideration is given to early Greek philosophers, to the Sophists, and to later developments. Requires written analysis of philosophical texts. *Prereq. One philosophy course.*
- PHL U330 Modern Philosophy 4 SH
Focuses on the hundred years between 1650 and 1750, sometimes called "the century of genius." It was a period in which philosophers reacted to the new scientific discoveries of Copernicus, Kepler, and Galileo. Out of this reaction came new ways of thinking about the nature of knowledge and the nature of reality. Focuses on such major figures as the rationalists Descartes, Leibniz, and Spinoza, and the empiricists Locke, Berkeley, and Hume. *Prereq. Two philosophy courses.*
- PHL U335 Nineteenth-Century Philosophy 4 SH
Focuses on a variety of nineteenth-century thinkers, such as Hegel, Feuerbach, Kierkegaard, Schopenhauer, Marx, and Darwin. *Prereq. Two philosophy courses.*
- PHL U340 Philosophy of Human Nature 4 SH
Focuses on various attributes of human beings, such as intelligence, sexuality, and language in the context of biological, psychological, linguistic, and philosophical views of human nature. *Prereq. Two philosophy courses.*
- PHL U343 Existentialism 4 SH
Examines existentialist philosophy in its greatest representatives, such as Kierkegaard, Nietzsche, Heidegger, Camus, and Sartre. Focuses on central themes including self-alienation, inauthenticity, authenticity, and existential experiences. *Prereq. Three philosophy courses.*

- PHL U350 Twentieth-Century Continental Philosophy 4 SH
Examines some of the main ideas and thinkers in twentieth-century continental philosophy as represented by such philosophers as Husserl, Heidegger, Sartre, Ricoeur, Gadamer, Habermas, and Derrida. *Prereq.* PHL U325 and PHL U330.
- PHL U355 Twentieth-Century Analytic Philosophy 4 SH
Explores some of the main ideas and thinkers in twentieth-century analytic philosophy as represented by such philosophers as Moore, Russell, Wittgenstein, the logical positivists, Quine, Popper, and Rawls. *Prereq.* PHL U325 and PHL U330.
- PHL U360 American Philosophy 4 SH
Studies major American thinkers including the classic pragmatists Charles Sanders Peirce, William James, John Dewey, as well as their predecessors and successors. *Prereq.* Two philosophy courses.
- PHL U387 Modern Jewish Thought 4 SH
Examines the thought of major Jewish thinkers of the modern era. May include such figures as Spinoza, Mendleson, Buber, Rosenzweig, Kaplan, Heschel, and Rubenstein. *Prereq.* Two philosophy courses.
- PHL U390 Cults and Sects 4 SH
Offers an examination of the varieties of religious experience from the perspectives of sociology and psychology of religion. Focuses on such cultic and sectarian groups as Christian Science, the American Shakers, the Unification Church, the Hare Krishna movement, and the Black Muslims. Provides students the opportunity to acquire critical investigative tools with which to analyze different religious expressions. *Prereq.* PHL U150 or two philosophy courses.
- PHL U410 Religion and Spirituality in the African Diaspora 4 SH
Examines religious thought and rituals and its diaspora in a comparative context. Topics include traditional religions, Islam, Christianity, and Judaism in Africa and the diaspora. Considerable attention is also given to the transformation of religions practiced in Africa when African captives were forced into the three slave trades affecting the continent of Africa: trans-Saharan, Indian Ocean, and transatlantic. *Prereq.* Sophomore standing or above.
- PHL U435 Moral Philosophy 4 SH
Explores two basic questions: What sorts of things are good or bad? What actions are right or wrong? Covers major philosophical theories about the nature of morality—whether it is relative or absolute, whether it accords or conflicts with self-interest. Such classic theories as utilitarianism and Kant are examined as well as contemporary developments and debates. *Prereq.* Two philosophy courses.
- PHL U440 Aesthetics 4 SH
Explores aesthetics, the philosophical analysis of concepts and the solution of problems that arise contemplating the arts. It is concerned with the nature of artistic expression and with the standards for judging art. Aesthetics asks the following questions: What features make objects beautiful or ugly? Are aesthetic qualities objective or “in the eye of the beholder”? Are there objective standards for the evaluation of art? Also considers how we can justify interpretations of art, music, or literature. *Prereq.* Two philosophy courses.
- PHL U445 Philosophy of Religion 4 SH
Asks the basic question, Does God exist? Examines several major arguments affirming and criticizing the notion of God’s existence. Explores a central problem in recent philosophy of religion of whether or not it makes any sense to speak of the truth or falsity of religious belief, as well as the implication an answer to that issue has for religious life. *Prereq.* Two philosophy courses.
- PHL U460 Philosophy and Literature 4 SH
Provides the student the opportunity to learn to recognize, appreciate, and criticize philosophical themes in literature. Includes readings from acknowledged classics by philosophical authors. *Prereq.* Two philosophy courses.
- PHL U465 Advanced Medical Ethics 4 SH
Designed for students with a background in moral philosophy or medical ethics. Takes an in-depth look at one major moral problem in medicine. Topics may include AIDS, euthanasia, or reproduction. *Prereq.* PHL U165 or PHL U435.
- PHL U477, PHL U478, PHL U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.
- PHL U500 Theory of Knowledge 4 SH
Focuses on questions about the nature and justification of claims to knowledge. Is there genuine knowledge? How do we tell when a belief or theory is sufficiently justified to count as knowledge? Discusses theories such as various forms of rationalism, empiricism, and skepticism. Requires careful reading of works by such influential thinkers as René Descartes, Bertrand Russell, A. J. Ayer, and T. S. Kuhn. *Prereq.* PHL U330 and two philosophy courses.
- PHL U505 Metaphysics 4 SH
Considers central problems and theories concerning the nature of reality, with special attention to such areas as the relation between mind and matter, free will and determinism, and criteria of existence. *Prereq.* PHL U330 and two philosophy courses.
- PHL U510 Philosophy of Science 4 SH
Focuses on the nature of scientific method, scientific theories, and scientific explanations. Examines the central question of why science is thought to provide the most reliable account of the nature of reality. Considers various theories about the nature and reliability of science. *Prereq.* Three philosophy courses.

PHL U515 Advanced Logic	4 SH	PHL U902 Great Philosophers Seminar	4 SH
Studies the major results in the metatheory of first-order logic. Examines consistency, completeness, and decidability. Discusses the general notion of an effectively computable process, Church's thesis, and the existence of unsolvable problems. <i>Prereq. PHL U215.</i>		Focuses on the writings of a major philosopher. Subjects include Plato, Aquinas, Locke, Hegel, and Heidegger. Specific philosophers vary, and students may register for the course more than once. <i>Prereq. Four philosophy courses.</i>	
PHL U520 Philosophy of Logic	4 SH	PHL U903 Seminar in Religion	4 SH
Examines philosophical problems and theories about the nature of logic. <i>Prereq. Permission of instructor.</i>		Examines topics including theodicy, cosmogony, contemporary issues in religion, and comparative ethics. Topics vary, and students may register for the course more than once. <i>Prereq. Three religious studies courses.</i>	
PHL U525 Philosophy of Social Science	4 SH	PHL U904 Major Figures in Religious Studies	4 SH
Examines philosophical issues that arise in the social scientific study of human beings and human societies. Do the social sciences use the same means as the natural sciences? Or must human beings be understood in special ways? Are there laws of human and social behavior? <i>Prereq. Three philosophy courses.</i>		Focuses on the work of one figure important in the field of religion. Subjects include Augustine, Calvin, Luther, Weber, and Eliade. Topics vary, and students may register for the course more than once. <i>Prereq. Four religious studies courses.</i>	
PHL U530 Philosophy of Psychology	4 SH	PHL U910 Research Internship	4 SH
Examines issues and problems that arise in the study of the mind and consciousness. <i>Prereq. PHL U330 and two philosophy courses.</i>		Seeks to familiarize students with at least one of the three stages of an advanced research project: securing research funds; using substantive research and research techniques; and publishing and presenting research results. Students may opt to take this practicum in conjunction with a writing project of their own. In addition to helping students develop additional knowledge of the research resources that are available, this course is intended to develop their critical skills. Fulfills the College of Arts and Sciences experiential education requirement for philosophy majors. <i>Prereq. Permission of instructor.</i>	
PHL U535 Philosophy of Mind	4 SH	PHL U915 Teaching Internship	4 SH
Seeks to show what puzzles and problems result from an honest attempt to answer these questions in a reasonable way: What is the relation between mind and body? Is the mental merely a function of bodily process and behavior, or does it somehow exist "over and above" the material? How are self-knowledge and knowledge of other minds achieved, and what is the relation between words and thoughts? Examines classical sources, such as Descartes and Locke, and contemporary sources, such as Wittgenstein and Putnam. Also seeks to arrive at some answers—however tentative or provisional—to these questions. Constantly challenges students to think and write well about these difficult subjects. <i>Prereq. PHL U330 and two philosophy courses.</i>		Centers on two issues central to the pedagogical enterprise; namely, course design and implementation. Involves discussions with the supervisor, observation of teaching techniques, test development, discussion leading, and lecture presentation. Students work with the instructor in one course, assist in syllabus development, observe and lead several discussions, and present a lecture or lectures on one topic to be determined during the syllabus development. Fulfills the College of Arts and Sciences experiential education requirement for philosophy majors. <i>Prereq. Six philosophy courses and permission of instructor.</i>	
PHL U540 Philosophy of Language	4 SH	PHL U921 Directed Study	1 SH
Examines prospects for a theory of language, its syntax, and its semantics. Examines contrasts between theory of reference and theory of meaning. Asks whether there are universals of language. Analyzes relations between linguistics and psychology. Includes readings from Frege, Quine, Russell, Chomsky, and Fodor. <i>Prereq. PHL U115 or LIN U115 and PHL U215 or LIN U215 or permission of instructor.</i>		PHL U922 Directed Study	2 SH
PHL U677, PHL U678, PHL U679	1 SH each	PHL U923 Directed Study	3 SH
Honors Adjunct		PHL U924 Directed Study	4 SH
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>		Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i>	
PHL U901 Topics in Philosophy Seminar	4 SH	PHL U954 Experiential Education Directed Study	4 SH
Focuses on one specific problem or issue in philosophy. Topics vary, and students may register for the course more than once. <i>Prereq. Four philosophy courses.</i>		Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement. <i>Prereq. Permission of instructor.</i>	

PHL U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

PHL U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. PHL U970 and honors program participation.*

PHYSICS

COLLEGE OF ARTS AND SCIENCES

PHY U100 College: An Introduction 1 SH
 Intended for freshmen in the College of Arts and Sciences. Introduces freshmen to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

PHY U111 Astronomy 4 SH
 Introduces modern astronomical ideas designed for non-science majors. Topics include an introduction to the cosmos; the earth and its relation to the universe; our solar system (planets, moons, asteroids, and comets); the sun and how it works; stars and their classification; and the life and death of stars. Introduces various tools of the astronomer (the nature of light and radiation, telescopes, the types of spectra, and what they tell us).

PHY U121 Introduction to Science 4 SH
 Provides non-science majors with an interdisciplinary treatment of the basic ideas of the natural sciences. Discusses concepts such as particles and waves, heat, optics, energy, gravity, and the atom, followed by a consideration of the ways in which atoms combine to form the substances that compose matter.

PHY U132 Energy, Environment, and Society 4 SH
 Provides non-science students with a practical knowledge of our present use of the earth's energy resources and the environmental consequences. Topics include solar energy, nuclear energy, global warming, oil politics, pollution, and electric cars. Draws upon multimedia presentations, a tour of MIT's fusion reactor, and Web-based sources. No knowledge of physics is assumed.

PHY U141 Physics for Engineering Technology 4 SH
 Focuses on units and scientific notation, force, Newton's first law, static equilibrium, Newton's second law, momentum,

work, kinetic energy, potential energy, power, rotational motion, Pascal's law, hydrostatic pressure, molecular mass, ideal gas law, and first and second laws of thermodynamics. A laboratory is included. *Coreq. PHY U142. Prereq. MTH U110 or taken concurrently; BSET majors only.*

PHY U142 Lab for PHY U141 0 SH
 Accompanies PHY U141. Covers topics from the course through various experiments. *Coreq. PHY U141.*

PHY U145 Physics for Life Sciences 1 5 SH
 Covers mechanics, fluids, and kinetic theory. The application of physics to a variety of problems is emphasized. Applications are largely taken from the life and health sciences. Topics include forces, torque, and static equilibrium; one-dimensional motion; Newton's laws; dynamics; work, energy, and power; friction, drag, pressure, and fluids; momentum and collisions; thermodynamics and kinetic theory; strength and materials; and radiation and radioactivity. A laboratory is included. *Coreq. PHY U146.*

PHY U146 Lab for PHY U145 0 SH
 Accompanies PHY U145. Covers topics from the course through various experiments. *Coreq. PHY U145.*

PHY U147 Physics for Life Sciences 2 5 SH
 Continues PHY U145. Covers electricity, oscillations, and waves. The application of physics to a variety of problems is emphasized. Applications are largely taken from instruments employed in life and health sciences. Topics include electrostatics, resistivity, and direct-current circuits; capacitors and RC circuits; oscillations and resonance; and waves and magnetism. *Coreq. PHY U148. Prereq. PHY U145.*

PHY U148 Lab for PHY U147 0 SH
 Accompanies PHY U147. Covers topics from the course through various experiments. *Coreq. PHY U147.*

PHY U149 Physics for Pharmacy 5 SH
 Offers an integrated lecture and laboratory course for pharmacy students. *Coreq. PHY U150.*

PHY U150 Lab for PHY U149 0 SH
 Accompanies PHY U149. Covers topics from the course through various experiments. *Coreq. PHY U149.*

PHY U151 Physics for Engineering 1 5 SH
 Offers the first semester of a three-semester integrated lecture and laboratory sequence intended primarily for engineering students. Covers Newtonian mechanics and fluids. The stress is balanced between understanding the basic concepts and solving specific problems. Topics include one-dimensional and three-dimensional motion; Newton's laws; dynamics; friction; drag; work; energy and power; momentum and collisions; rotational dynamics; forces; torque and static equilibrium; pressure and fluids; and gravity. *Coreq. PHY U152 and PHY U153. Prereq. MTH U241.*

PHY U152 Lab for PHY U151 Accompanies PHY U151. Covers topics from the course through various experiments. <i>Coreq. PHY U151 and PHY U153.</i>	0 SH	PHY U277, PHY U278, PHY U279 Honors Adjunct Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each
PHY U153 Interactive Learning Session for PHY U151 Accompanies PHY U151. Offers an opportunity for interactive problem solving. <i>Coreq. PHY U151 and PHY U152.</i>	0 SH		
PHY U155 Physics for Engineering 2 Continues PHY U151. Offers integrated lecture and laboratory. Topics include electrostatics; capacitors; resistors and direct-current circuits; magnetism and magnetic induction; RC, LR, and LRC circuits; oscillations; waves; electromagnetic waves; and radiation and radioactivity. <i>Coreq. PHY U156 and PHY U157. Prereq. PHY U151.</i>	5 SH	PHY U303 Modern Physics Reviews experiments demonstrating the atomic nature of matter, the properties of the electron, the nuclear atom, the wave-particle duality, spin, and the properties of elementary particles. Discusses, mostly on a phenomenological level, such subjects as atomic and nuclear structure, properties of the solid state, and elementary particles. Introduces the special theory of relativity. <i>Prereq. PHY U165 or equivalent.</i>	4 SH
PHY U156 Lab for PHY U155 Accompanies PHY U155. Covers topics from the course through various experiments. <i>Coreq. PHY U155 and PHY U157.</i>	0 SH	PHY U305 Thermodynamics and Statistical Mechanics Focuses on first and second laws of thermodynamics, entropy and equilibrium, thermodynamic potentials, elementary kinetic theory, statistical mechanics, and the statistical interpretation of entropy. <i>Prereq. PHY U165 and MTH U541.</i>	4 SH
PHY U157 Interactive Learning Session for PHY U155 Accompanies PHY U155. Offers an opportunity for interactive problem solving. <i>Coreq. PHY U155 and PHY U156.</i>	0 SH		
PHY U161 Physics 1 Offers the first semester of a two-semester integrated lecture and laboratory sequence intended primarily for science students. Covers Newtonian mechanics and fluids. The underlying principles and concepts are emphasized. Applications are taken from a wide variety of fields including life sciences and medicine, astro- and planetary physics, and so on. Topics include forces; torque and static equilibrium; one-dimensional and three-dimensional motion; Newton's laws; dynamics; friction; drag; work; energy and power; momentum and collisions; rotational dynamics; pressure and fluids; and gravity. <i>Coreq. PHY U162. Prereq. MTH U241.</i>	5 SH	PHY U371 Electronics Covers electronic techniques for experimental research in many different fields of science. Focuses on principles of semiconductor devices; analog techniques (amplification, feedback, and integration); digital techniques (counting, multiplexing logic); design of electronic subsystems (analog-to-digital converters, phase-sensitive detectors, and data-logging systems); and understanding specifications of commercial electronic equipment. In lab examples, makes use of up-to-date integrated discrete devices such as are currently used in the electronics industry. <i>Coreq. PHY U372. Prereq. PHY U165 or equivalent.</i>	4 SH
PHY U162 Lab for PHY U161 Accompanies PHY U161. Covers topics from the course through various experiments. <i>Coreq. PHY U161.</i>	0 SH	PHY U372 Lab for PHY U371 Accompanies PHY U371. Covers topics from the course through various experiments. <i>Coreq. PHY U371.</i>	0 SH
PHY U165 Physics 2 Continues PHY U161. Offers the second semester of a two-semester integrated lecture and laboratory sequence intended primarily for science students. Topics include electrostatics; capacitors; resistors and direct-current circuits; magnetism and magnetic induction; RC, LR, and LRC circuits; oscillations; waves; electromagnetic waves; and radiation and radioactivity. <i>Coreq. PHY U166. Prereq. PHY U161 and MTH U141 or equivalent.</i>	5 SH	PHY U477, PHY U478, PHY U479 Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each
PHY U166 Lab for PHY U165 Accompanies PHY U165. Covers topics from the course through various experiments. <i>Coreq. PHY U165.</i>	0 SH	PHY U500 Physics with Computers Introduces the use of computer software to solve scientific problems. Various problems from the physical and biological sciences are studied using MATLAB. Topics vary from term to term but may include basic probability and statistics, simulation of random processes, data fitting and presentation, graphical presentations, and use of specialized packages (such as differential equation-solving routines) to perform numerical calculations. <i>Prereq. Permission of instructor.</i>	4 SH

- PHY U600 Advanced Physics Laboratory 1 4 SH
Offers a general treatment of the problems of mechanical and electromagnetic radiation as wave phenomena. Focuses on the differential wave equation and its application to selected topic interference and diffraction theory from the standpoint of the Huygens-Fresnel and Kirchhoff formulations; selected experiments in acoustics, optics, and microwaves illustrate these problems. *Prereq. PHY U303.*
- PHY U601 Classical Dynamics 4 SH
Covers advanced topics in classical mechanics including vector kinematics, harmonic oscillator and resonance, generalized coordinates, Lagrange's equations, central forces and the Kepler problem, rigid body motion, and mathematical methods in physics. *Prereq. PHY U165, MTH U345, and PHY U232 or equivalent.*
- PHY U602 Electricity and Magnetism 4 SH
Covers electrostatics and dielectric materials, magnetostatics and magnetic materials, currents in conductors, induction, displacement currents, computer solutions of EM problems, and Maxwell's equations. *Prereq. PHY U165 and PHY U232 or equivalent.*
- PHY U603 Electromagnetic Waves and Optics 4 SH
Focuses on electromagnetic waves in vacua and matter, electrodynamics and radiation, and computer visualization of electromagnetic fields. Also considers special relativity. *Prereq. PHY U602 or equivalent.*
- PHY U611 Astrophysics and Cosmology 4 SH
Introduces current ideas in astrophysics and cosmology with emphasis on recent advances in the field. Topics include tools of the astronomer (telescopes, spectroscopy, and methods of distance measurement); the solar system; stellar properties (stellar spectra, stellar energy sources such as gravitational or nuclear); Hertzsprung-Russell diagram; evolution of stars (birth, life, and ultimate collapse); our Milky Way galaxy; extragalactic objects (galaxies, clusters of galaxies, radio galaxies, and quasars); cosmology (Olber's paradox, recession of galaxies, big bang theory, cosmic background radiation, formation of galaxies, and the future of the universe). *Prereq. PHY U165 and PHY U303.*
- PHY U613 Particle and Nuclear Physics 4 SH
Introduces the physics of atomic nuclei and elementary particles. Topics include classification of nuclei, strong and weak nuclear forces, mesons and nucleons, quarks and gluons, and unified theories of elementary particle interactions. *Prereq. PHY U303.*
- PHY U614 Condensed Matter Physics 4 SH
Offers a semiclassical treatment of the thermal, magnetic, and electrical properties of crystalline solids. Examines X-ray diffraction and the reciprocal lattice; elasticity and lattice vibrations; specific heat, properties of insulators; magnetism in insulators and metals; and introduction to the band theory of metals. *Prereq. MTH U541, PHY U303, and PHY U305.*
- PHY U617 Quantum Mechanics 4 SH
Focuses on observation of macroscopic and microscopic bodies; the uncertainty principle; wave-particle duality; probability amplitudes; Schrödinger wave theory and one-dimensional problems; Schrödinger equation in three dimensions; angular momentum; and the hydrogen atom. *Prereq. PHY U165 and PHY U303.*
- PHY U621 Biological Physics 1 4 SH
Examines the physical principles of bioelectricity. Covers the anatomical and physiological basis of signal propagation in nerve and muscle cells; the active properties of cell membranes; electrophysiological models of charge and ion transport across membranes; action potential propagation in excitable tissues; the behavior of bioelectric and biomagnetic fields in and around the volume conductors formed by the body; and the theoretical foundations of electrocardiology and electroencephalography. *Prereq. PHY U303, BIO U403, and permission of instructor.*
- PHY U623 Medical Physics 4 SH
Introduces the physical principles and basic mathematical methods underlying the various modalities of medical imaging. These include computed tomography (CT), magnetic resonance (MRI), positron emission tomography (PET), single-photon emission tomography (SPECT), and ultrasound. Covers nuclear physics and the interaction of radiation with biological matter with application to radiation therapy. *Prereq. MTH U541 and permission of instructor.*
- PHY U651 Medical Physics Seminar 1 4 SH
Offers the first part of a seminar series conducted by expert practitioners from Boston-area hospitals. Examines the clinical applications of medical imaging methods (CT, MRI, and PET), the clinical applications of radiation therapy, and the clinical applications of lasers and optical techniques. Includes site visits to local hospitals and medical instrumentation companies. *Prereq. PHY U623.*
- PHY U652 Medical Physics Seminar 2 4 SH
Continues PHY U651. Further examines the clinical applications of medical imaging methods (CT, MRI, and PET), the clinical applications of radiation therapy, and the clinical applications of lasers and optical techniques. *Prereq. PHY U651.*
- PHY U673 Project Laboratory 4 SH
Allows students to select and carry out individual projects involving instrumentation and computation. Involves the development of some aspect of instrumentation and/or computation in an ongoing research project and the preparation of a final report. The student is supervised by the project leader and the course instructor. *Prereq. Permission of instructor.*
- PHY U677, PHY U678, PHY U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

PHY U700 Advanced Physics Laboratory 2 4 SH
 Continues PHY U600. Presents special projects in modern experimental physics including electronic instrumentation used in measuring physical quantities and use of micro-processors. *Prereq. PHY U371, PHY U600, and junior or senior standing.*

PHY U921 Directed Study 1 SH
 PHY U922 Directed Study 2 SH
 PHY U923 Directed Study 3 SH
 PHY U924 Directed Study 4 SH
 Offers independent work under the direction of a member of the department on a chosen topic. Course content depends on instructor. *Prereq. Junior or senior standing.*

PHY U954 Experiential Education Directed Study 4 SH
 Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement.

PHY U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

PHY U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. PHY U970 and honors program participation.*

DOCTOR OF PHARMACY

BOUVÉ COLLEGE OF HEALTH SCIENCES

PMD U101 Introduction to the Profession of Pharmacy 1 SH
 Introduces the profession of pharmacy in this 1-credit course. Lectures cover pharmacists' responsibilities, pharmacy organizations, ethical issues related to health care, and the education and training of pharmacists. Covers the role of the pharmacist within different health-care systems. Guest speakers from several areas of pharmacy practice provide firsthand information on career options. *Prereq. PharmD students or permission of instructor.*

PMD U201 Introduction to Pharmacy Practice 1 SH
 Provides students with the knowledge and skills used during the first cooperative education assignment. Topics include the top one hundred medications, pharmacy calculations, pharmacy law, interpreting prescriptions and medication orders, and sterile products. *Prereq. CHM U214 and BIO U113.*

PMD U277, PMD U278, PMD U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

PMD U310 Communications 3 SH
 Provides students with various frameworks for understanding and practicing tools for engaging in effective interpersonal communication, with emphasis on the health-care contexts. Pharmacist-patient, pharmacist-physician, pharmacist-supervisor, and pharmacist-health professional communications are examined. Consists of lectures, discussions of assigned material, and individual and group exercises. *Prereq. CHM U214, BIO U113, and second-year PharmD standing.*

PMD U341 Pharmacy Seminar 1 SH
 Allows students to reflect with faculty upon their experiences, and to reinforce pharmacy skills learned in PMD U101 and PMD U201. Focuses on connecting theory to practice utilizing pharmaceutical calculations and drug names. Allows students to gain an understanding of many workplace issues they may encounter during their co-op experience. Students complete an assignment in pharmaceutical calculations with their pharmacy preceptor or other pharmacist while on co-op as well as orally present a calculation problem that they encountered on co-op. Students also review the "early experiential competency set" with their co-op faculty coordinator. When necessary, students are referred to appropriate faculty for remediation. Meets ACE objectives of developing skills related to effective thinking, communication, connecting theory to practice, and interpersonal skills. *Prereq. Third-year PharmD standing and first co-op.*

PMD U350 Health-Care Systems 3 SH
 Examines the evolution of the health-care system in the United States, from the early forms of organized institutional care to the dynamic, increasingly integrated, managed-care system of present health-care delivery. Examines the interaction of regulatory, economic, political, social, and ethical aspects of the health-care system, with emphasis on issues related to pharmacy practice. Current proposals for health-care and drug-related reform and regulation are considered. Considers the impact and consequences of action in one era on the structure and function of health care in later years. *Prereq. Third-year PharmD standing.*

PMD U370 Pharmacotherapeutics 2 SH
 for Physical Therapy Practice
 Covers the effects and side effects of medications that are encountered by the physical therapy practitioner. *Prereq. Physical therapy majors only.*

- PMD U401 Pathophysiology** 4 SH
Examines the mechanisms of human disease, emphasizing fundamental principles of cellular biology. Dedicates early sessions to understanding normal cell biology, cell vulnerabilities, and cellular responses to injury. Discusses systemic responses to injury including inflammation, immunity, and hemostasis. A detailed discussion of oncogenesis is followed by a system-by-system review of disease states. *Prereq. PSC U301 and third-year PharmD standing.*
- PMD U440 Self-Care Therapeutics** 4 SH
Examines the types of medications available without a prescription, traditionally referred to as over-the-counter (OTC). The class is team-taught by the pharmacy practice faculty, and students are exposed to several different teaching styles: didactic teaching, small group discussions/projects, large classroom case discussions, and hands-on learning (for example, using a variety of glucometers, understanding/performing a monofilament exam, or performing subcutaneous injection technique). Covers the recommendation/selection of a specific nonprescription product that would relieve signs and symptoms of common self-treatable illnesses and proper patient education (proper dose, directions for use, possible adverse effects, and contraindications of these medications). *Prereq. Fourth-year PharmD standing.*
- PMD U450 Research Methodology and Biostatistics** 4 SH
Covers aspects of experimental design and hypothesis testing. Uses critical reading of clinical trials, observational studies, and problem sets to illustrate principles of research design, conduct, and analysis. Discusses statistical tests that are appropriate for the selected study design. Students are required to complete a research protocol. *Prereq. Fourth-year PharmD standing.*
- PMD U477, PMD U478, PMD U479** 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- PMD U510 Therapeutic Drug Monitoring and Applications** 2 SH
Covers the developing, monitoring, and modifying of drug dosage regimens as applied in clinical practice. Examines the use of pharmacokinetic factors influencing the selection of dosage regimens for various therapeutic drug categories. Develops the application of test performance characteristics in interpreting drug-serum concentrations and the application of these principles and concepts to the monitoring of drug therapy. *Prereq. Fourth-year PharmD standing.*
- PMD U530 Jurisprudence** 3 SH
Covers all federal and state laws and regulations that affect the practice of pharmacy. Sources of law discussed include the U.S. Constitution, statutes, administrative regulations, and case law. Introduces federal and state administrative agencies that regulate pharmacy including the Drug Enforcement Administration (DEA), Food and Drug Administration (FDA), Consumer Products Safety Commission (CPSC), Massachusetts Board of Registration in Pharmacy, and Massachusetts Department of Public Health. Students research a pharmacy case decided by a court and give an oral presentation. Centers on the individuals who operate a pharmacy: pharmacists, pharmacy technicians, and pharmacy interns; the workplaces where they perform their duties: pharmacy, pharmacy department, hospital, restricted pharmacy, managed care, nuclear pharmacy, and wholesale businesses; and duties performed by pharmacy personnel: dispensing medication and counseling patients. *Prereq. Fourth-year PharmD standing.*
- PMD U539 Introduction to Therapeutics** 4 SH
Emphasizes the medical management of the disease states most frequently encountered in practice, considerations and precautions that are required in the proper selection and dosing of drugs most frequently used in these disease states, and the recognition of clinically significant, efficacious, and/or toxic drug effects. Topics include the clinical approach to pharmaceutical care and drug-related problems, and disease state management. *Coreq. PMD U540. Prereq. Fourth-year PharmD standing.*
- PMD U540 Therapeutics Lab 1** 0 SH
Accompanies PMD U539. Discusses clinical cases. Students are expected to contribute to discussions of cases and lead discussions involving the entire conference group. Emphasis is on integration and problem solving. Students are encouraged to verbalize, integrate, and reinforce information learned from lectures, readings, and previous course work. *Coreq. PMD U539.*
- PMD U541 Therapeutics 1** 4 SH
Emphasizes the medical management of the disease states most frequently encountered in practice, considerations and precautions that are required in the proper selection and dosing of drugs most frequently used in these disease states, and the recognition of clinically significant, efficacious, and/or toxic drug effects. Topics include disease state management, endocrinology, and renal diseases. *Coreq. PMD U542 and PMD U543. Prereq. PMD U539 and fifth-year PharmD standing.*
- PMD U542 Therapeutics 2** 4 SH
Emphasizes the medical management of the disease states most frequently encountered in practice; considerations and precautions that are required in the proper selection and dosing of drugs most frequently used in these disease states; and the recognition of clinically significant, efficacious, and/or toxic drug effects. Topics include cardiovascular diseases, gastrointestinal diseases, and diseases of the critically ill. *Coreq. PMD U541 and PMD U543. Prereq. PMD U539 and fifth-year PharmD standing.*

PMD U543 Therapeutics Lab 2 0 SH
 Accompanies PMD U541 and PMD U542. Discusses clinical cases. Students are expected to contribute to discussions of cases and lead discussions involving the entire conference group. Emphasis is on integration and problem solving. Students are encouraged to verbalize, integrate, and reinforce information learned from lectures, readings, and previous course work. *Coreq. PMD U541 and PMD U542.*

PMD U544 Therapeutics 3 4 SH
 Continues PMD U542. Emphasizes the medical management of the disease states most frequently encountered in practice; considerations and precautions that are required in the proper selection and dosing of drugs most frequently used in these disease states; and the recognition of clinically significant, efficacious, and/or toxic drug effects. Topics include infectious diseases, pediatrics, and geriatrics. *Coreq. PMD U545 and PMD U546. Prereq. PMD U542 and fifth-year PharmD standing.*

PMD U545 Therapeutics 4 4 SH
 Emphasizes the medical management of the disease states most frequently encountered in practice; considerations and precautions that are required in the proper selection and dosing of drugs most frequently used in these disease states; and the recognition of clinically significant, efficacious, and/or toxic drug effects. Topics include neurology, psychiatry, hematology, and oncology. *Coreq. PMD U544 and PMD U546. Prereq. PMD U542 and fifth-year PharmD standing.*

PMD U546 Therapeutics Lab 3 0 SH
 Accompanies PMD U544 and PMD U545. Discusses clinical cases. Students are expected to contribute to discussions of cases and lead discussions involving the entire conference group. Emphasis is on integration and problem solving. Students are encouraged to verbalize, integrate, and reinforce information learned from lectures, readings, and previous course work. *Coreq. PMD U544 and PMD U545.*

PMD U550 Pharmacy Care Management 3 SH
 Focuses on the managerial and administrative skills required by a contemporary pharmacist practicing in either a community or hospital setting. Covers classical management principles of planning, decision making, organizing, hiring, and controlling. Case study methods are used as an interactive teaching tool. Also covers pertinent current events. *Prereq. PMD U350 and fifth-year PharmD standing.*

PMD U560 Drug Information and Evaluation 3 SH
 Allows students to develop the skills necessary to become effective providers of drug information. An effective provider assesses and evaluates drug information needs, and evaluates, communicates, and applies data from the published literature and other sources to optimize patient care. These skills are developed by using didactic instruction, providing responses to several drug information requests, and writing one drug information paper. *Prereq. ENG U306 and fourth-year PharmD standing.*

PMD U569 Pharmaceutical Care Practice 2 SH
 Offers a simulation of the problems and activities commonly seen in both ambulatory/community and institutional pharmacy practice in this lab. Students receive patients with drug-related needs and problems to be resolved. Students are required to complete activities to resolve the need or problem for their patient. Students are also required to provide information to both health professionals and patients with regard to drug therapy. Students use computers to maintain patient profiles, document drug-related problems, and find appropriate resolutions to problems. *Prereq. PMD U530 and fifth-year PharmD standing.*

PMD U570 Pharmacoeconomics 4 SH
 Compares and contrasts the principles and applications of benefit-cost analysis, cost-effectiveness analysis, and cost-utility analysis in the evaluation of pharmaceutical products, drug delivery systems, and health-care organization structure. Techniques of cost analyses and outcomes assessment are applied to drug-drug evaluations. Working in groups, students are required to conduct an original, modeled pharmacoeconomic decision analytic study and present it in a platform PowerPoint presentation, article suitable for journal submission, and professional poster. *Prereq. PMD U450, PMD U541, PMD U560, and fifth-year PharmD standing.*

PMD U579 Pharmaceutical Care Practice 2 2 SH
 Provides students with functional knowledge and skills in the area of physical assessment. Students are taught through a variety of methods: didactic teaching, videos/simulators, classroom discussions, and hands-on learning. Offers students an opportunity to learn to perform a medical history (medication history) and a general assessment of a patient, perform vital signs on a patient (weight, blood pressure, pulse, and respiration), and interpret the physical assessment as documented by other clinicians. *Prereq. CPR certification and fifth-year PharmD standing.*

PMD U677, PMD U678, PMD U679 1 SH each
 Honors Adjunct
 Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

PMD U921 Directed Study 1 SH
 PMD U922 Directed Study 2 SH
 PMD U923 Directed Study 3 SH
 PMD U924 Directed Study 4 SH
 Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

PMD U940 Internal Medicine Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communications to the pharmaceutical-care management of individual patients. In collaboration with other members of the health-care team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. Sixth-year PharmD standing.

PMD U941 Acute Care Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communications to the pharmaceutical-care management of individual patients. In collaboration with other members of the health-care team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. Sixth-year PharmD standing.

PMD U942 Ambulatory Care Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communications to the pharmaceutical-care management of individual patients. In collaboration with other members of the health-care team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. Sixth-year PharmD standing.

PMD U943 Community Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communications to the pharmacy-care management of individual patients in the community setting. In collaboration with other members of the health-care team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. PMD U940 and sixth-year PharmD standing.

PMD U944 Internal Medicine Elective 6 SH
Advanced Practice Experience
Applies principles of pathophysiology, therapeutics, and communications to the pharmaceutical-care management of individual patients. In collaboration with other members of the health-care team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. PMD U941 and sixth-year PharmD standing.

PMD U945 Ambulatory Care Elective 6 SH
Advanced Practice Experience
Applies principles of pathophysiology, therapeutics, and communications to the pharmaceutical-care management of individual patients. In collaboration with other members of the health-care team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. PMD U943 and sixth-year PharmD standing.

PMD U946 Psychiatry Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communication to the pharmaceutical-care management of individual patients in the community practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, students are responsible for identifying appropriate drug therapy, monitoring parameters, and providing pertinent patient education for common pathophysiologic processes based on the unique characteristics of individual patients. Students may also receive experience and training in community pharmacy administration and management. Prereq. Sixth-year PharmD standing.

PMD U947 Community Elective Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communications to the pharmacy-care management of individual patients in the community setting. In collaboration with other members of the health-care team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. Sixth-year PharmD standing.

PMD U948 Long-Term Care Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. Sixth-year PharmD standing.

PMD U949 Geriatrics Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a geriatric practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. Sixth-year PharmD standing.

PMD U950 Pediatrics Advanced Practice Experience 6 SH
 Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a pediatric practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. *Prereq. Sixth-year PharmD standing.*

PMD U951 Neonatology Advanced Practice Experience 6 SH
 Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in the community practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. *Prereq. Sixth-year PharmD standing.*

PMD U952 Critical Care Advanced Practice Experience 6 SH
 Applies principles of pathophysiology, therapeutics, and communications to the pharmaceutical-care management of individual patients. In collaboration with other members of the health-care team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. *Prereq. PMD U940 or PMD U941 and sixth-year PharmD standing.*

PMD U953 Surgery Advanced Practice Experience 6 SH
 Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a surgical practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. *Prereq. Sixth-year PharmD standing.*

PMD U954 Cardiology Advanced Practice Experience 6 SH
 Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a cardiology practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. *Prereq. Sixth-year PharmD standing.*

PMD U955 Pharmacokinetics Advanced Practice Experience 6 SH
 Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in an institutional practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. *Prereq. Sixth-year PharmD standing.*

PMD U956 Drug Information Advanced Practice Experience 6 SH
 Applies drug information skills in an institution practice setting under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the site team. Using appropriate sources, students analyze drug information findings including dosing, monitoring, indications, efficacy, and adverse drug reactions. *Prereq. Sixth-year PharmD standing.*

PMD U957 Oncology Advanced Practice Experience 6 SH
 Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of patients in an oncology practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. *Prereq. Sixth-year PharmD standing.*

PMD U958 Drug Utilization Advanced Practice Experience 6 SH
 Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in the community practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. *Prereq. Sixth-year PharmD standing.*

PMD U959 Home Health Advanced Practice Experience 6 SH
 Applies principles of pathophysiology, therapeutics, and communication to the design and completion of drug use evaluation. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of topics and design of methodology for drug use evaluation and completion of data collection, data evaluation, and presentation of results. *Prereq. Sixth-year PharmD standing.*

PMD U960 Nutritional Support Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a home-based care practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. Sixth-year PharmD standing.

PMD U961 Infectious Disease Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in an institutional practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. Sixth-year PharmD standing.

PMD U962 Pharmacy Industry Advanced Practice Experience 6 SH
Applies health-care and regulatory affairs principles with emphasis on the pharmaceutical industry. Under the supervision of a preceptor, and, when appropriate, in conjunction with other members of the site team, offers participation in appropriate activities related to drug research and development, marketing, medical affairs, and information service. Prereq. Sixth-year PharmD standing.

PMD U963 Pharmacy Administration 6 SH
Advanced Practice Experience
Applies health-care and management principles with emphasis on pharmacy administration under the supervision of a preceptor, and, when appropriate, in conjunction with other members of the site team. Prereq. Sixth-year PharmD standing.

PMD U964 Regulatory Advanced Practice Experience 6 SH
Applies health-care and regulatory affairs principles with emphasis on the pharmaceutical industry. Under the supervision of a preceptor, and, when appropriate, in conjunction with other members of the site team, offers participation in appropriate activities related to drug development and delivery. Prereq. Sixth-year PharmD standing.

PMD U965 Managed-Care Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patient in a managed-care practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and,

when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. Sixth-year PharmD standing.

PMD U966 Transplantation Advanced Practice Experience 6 SH
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a transplantation unit. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the health-care team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. Prereq. Sixth-year PharmD standing.

PMD U967 Directed Practice Advanced Practice Experience 6 SH
Provides nontraditional experience with an approved preceptor at an appropriate site, based on availability. Prereq. Sixth-year PharmD standing.

PMD U968 International Advanced Practice Experience 6 SH
Provides an international experience with an approved preceptor at an appropriate site, based on availability. Prereq. Sixth-year PharmD standing.

PMD U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. Prereq. Honors program participation.

PMD U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Prereq. PMD U970 and honors program participation.

POLITICAL SCIENCE

COLLEGE OF ARTS AND SCIENCES

POL U100 College: An Introduction 1 SH
Introduces first-year political science majors to the discipline, the department, and the University as a whole; familiarizes students with the skills needed for success as a university student.

POL U101 Experiential Education Preparatory Workshop 1 SH
Required of all political science majors prior to going into the first cooperative education assignment. Covers such topics as current social and economic conditions, workplace expectations, professional and ethical behavior, résumé writing, and interviewing skills.

POL U150 American Government	4 SH	Participants; and how all of this is affected by the structure of Congress and the process embedded in the legislative body. <i>Prereq. POL U150.</i>
Analyzes the functions of the systems of government and politics in the United States. Includes the philosophical origins and design of the Constitution, public opinion, political behavior and participation, parties and interest groups, and formal governmental institutions. <i>Coreq. POL U151.</i>		
POL U151 Recitation for POL U150	0 SH	POL U305 The American Presidency
Provides small-group discussion format to cover material in POL U150. <i>Coreq. POL U150.</i>		4 SH
POL U155 Comparative Politics	4 SH	Examines the presidential electoral process and the constitutional and extra-constitutional powers of the U.S. President. Studies the presidential leadership styles and analyzes the relationship between the executive branch and Congress, the Supreme Court, the bureaucracy, and the media. <i>Prereq. POL U150.</i>
Presents a comparative study of political organization and behavior in a range of countries beyond the United States. Topics includes political culture, political economy, governing institutions, leadership, and political participation. <i>Coreq. POL U156.</i>		POL U310 Parties and Elections
POL U156 Recitation for POL U155	0 SH	4 SH
Provides small-group discussion format to cover material in POL U155. <i>Coreq. POL U155.</i>		Analyzes political parties and the American system of elections. Focuses on structural and constitutional biases, the organizational aspects of the parties, mass voting behavior, the impact of elections on public policymaking, and national and state historical trends. <i>Prereq. POL U150.</i>
POL U160 International Relations	4 SH	POL U315 Interest Groups and Public Policy
Examines major issues in the international system. Covers topics of international trade and monetary affairs; war, weapons of mass destruction, and disarmament; international law and organizations; human rights; international and regional integration; and the impact of technology on the functioning of the international system. <i>Coreq. POL U161.</i>		4 SH
POL U161 Recitation for POL U160	0 SH	Surveys the roles of organized interests in American public policymaking. Examines why groups are formed, how they work, why they succeed or fail, and what cumulative impacts groups have on policy. Spans a variety of groups, from the traditional economic interests to social movements, public interest organizations, and professional lobbyists. <i>Prereq. POL U150.</i>
Provides small-group discussion format to cover material in POL U160. <i>Coreq. POL U160.</i>		POL U320 Politics and Mass Media
POL U165 Public Policy and Administration	4 SH	4 SH
Analyzes the structure of and dynamics inherent in public policymaking and public administration in the United States. Introduces such concepts as problem definition, agenda development, policy formation, program implementation, and policy evaluation. Covers key issues in public administration including budgeting, personnel, and organizational design. <i>Coreq. POL U166. Prereq. POL U150.</i>		Analyzes several facets of the mass media: the role of newspapers, radio, television, and the Internet in public opinion formation; their use and effectiveness in political campaigns; their objectivity and/or bias in reporting the news; and their impact on public policymaking. <i>Prereq. POL U150.</i>
POL U166 Recitation for POL U165	0 SH	POL U322 Political Behavior
Provides small-group discussion format to cover material in POL U165. <i>Coreq. POL U165.</i>		4 SH
POL U277, POL U278, POL U279	1 SH each	Examines selected topics in political science from a political behavior perspective. Focuses on political attitude formation and change; ideology; public opinion and voting behavior; political campaigning; political violence; and empirical democracy theory. <i>Prereq. POL U150.</i>
Honors Adjunct		POL U324 Law and Society
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>		4 SH
POL U300 The U.S. Congress	4 SH	Examines the sociological understanding of legal phenomena. Places special emphasis on the role of the law in cultural and social conflicts in American society. <i>Prereq. 64 SH toward degree or junior or senior standing.</i>
Explores the structures, dynamics, and styles inherent in public policymaking within the U.S. Congress. Focuses on elections; representations of constituents' interests; the roles that members play: the president, interest groups, and other		POL U326 Premodern Political Thought
		4 SH
		Presents an analytical and historical examination of the great political thinkers and the main trends of political thought from classical Greece to the Renaissance. <i>Prereq. 64 SH toward degree or junior or senior standing.</i>
		POL U328 Modern Political Thought
		4 SH
		Presents an analytical and historical examination of the great political thinkers and the main trends in political thought from the Renaissance to the twentieth century. <i>Prereq. 64 SH toward degree or junior or senior standing.</i>

- POL U330 American Political Thought 4 SH
Analyzes the main streams in American political thought including liberalism, neoliberalism, conservatism, and nationalism. Examines the historic roots of each viewpoint and its impact on American politics. Explores the ongoing interaction of political thought and the political process in contemporary American society. *Prereq. POL U150 is recommended; 64 SH toward degree or junior or senior standing.*
- POL U332 Contemporary Political Thought 4 SH
Analyzes current ideals, ideologies, ethics, and political values including, but not limited to, issues of economic and social power; competing views on ethnic, racial, and sexual identity; and animal rights. *Prereq. 64 SH toward degree or junior or senior standing.*
- POL U334 Bureaucracy and Government Organizations 4 SH
Examines the general principles underlying the structures, processes, and operation of public organizations. Examines the role of bureaucracies within the larger political system as well as how public agencies develop and change over time. *Prereq. POL U150.*
- POL U335 Budgeting and Taxation 4 SH
Focuses on the function of budgeting in a variety of governmental contexts—specifically, the appropriations process, the budget as a management tool, and the public-policy impacts of the budget. Emphasizes budgeting techniques within this context. *Prereq. POL U150.*
- POL U340 Business and Government 4 SH
Surveys the relationship between economics and politics in the United States. Considers the role of government in a market economy including the efforts to manage economic growth, prevent monopoly, promote social welfare, and balance the power of business with the demands of democracy. *Prereq. POL U150.*
- POL U344 Contemporary Black Politics 4 SH
Analyzes the evolution of black political thought in America and examines the sociopolitical contests that have served as catalysts to modern black political movements. *Prereq. Sophomore standing or above.*
- POL U345 Urban Policies and Politics 4 SH
Analyzes the political, administrative, economic, and social dynamics of urban areas. Highlights the diversity of political institutions and practices in American cities. Introduces key policy areas at the city level such as land use, economic development, and education. *Prereq. POL U150.*
- POL U350 State and Local Politics 4 SH
Examines the political and administrative context of the state and local government in the United States; surveys the structure, function, and politics of states and localities within the context of the U.S. federal system; and highlights the diversity of political institutions and practices at the state and local levels. *Prereq. POL U150.*
- POL U355 Intergovernmental Relations 4 SH
Analyzes the relationship among national, state, and local levels of government in the United States and the changing patterns of those relationships. Highlights the political, legal, and fiscal nature of intergovernmental relations. *Prereq. POL U150.*
- POL U357 Growth/Decline of Cities and Suburbs 4 SH
Introduces students to the field of urban studies. Focuses on three central issues: how cities and suburbs evolve, what makes a city or suburb a good place to live, and how cities and suburbs are (or are not) planned. Students review the ways in which urban scholars and practitioners study cities and suburbs, their research methodologies, definition of issues, and division of labor among different disciplines. Students explore the roles of individuals, communities, the private sector, and government in planning and shaping the city.
- POL U358 Current Issues in Cities and Suburbs 4 SH
Introduces students to pressing urban issues: urban sprawl, poverty, education, transportation, economic development, and housing, through an intensive analysis of the Boston metropolitan area. The course is co-taught by University faculty and practitioners in government, community, and nonprofit organizations throughout the metropolitan area. Offers students the opportunity to analyze Boston data, go on outings to see development in progress, talk with urban practitioners about what they do, and conduct research on an urban issue of their choice.
- POL U360 Politics of Poverty 4 SH
Explores how and why there is poverty, how it affects people's lives, and how it can be eliminated. Examines the relations between poverty, racial and ethnic factors, and the economic, political, and administrative systems. Evaluates a number of alternatives and provides an opportunity for clarifying individual assumptions and feelings about poverty. *Prereq. POL U150 is recommended.*
- POL U365 Blacks and Jews 4 SH
Compares the black and Jewish experiences in the United States. Themes include remembered slavery and commemoration of freedom; Holocaust and genocide; religious expressions of politics; black-Jewish relations; and black Judaism. *Prereq. POL U150 is recommended or any other introductory social science course.*
- POL U370 Religion and Politics 4 SH
Explores the role of religion in domestic and international politics. Examines religion as a source of political tension and strife. Draws examples from the United States and the developing world. Covers Islamic fundamentalism in Africa and the Near East, Orthodox Jewish parties in Israel, Catholic liberation theology in Latin America, and Protestant fundamentalism and the religious right in the United States. *Prereq. POL U150.*

- POL U375 Gender and Politics 4 SH
Explores the relation between what is and what ought to be—and why—in the roles of women in American politics. Examines the traditional roles of women in politics, the suffrage movement, the woman as citizen and voter, the role of gender in achieving power and in political efficacy, and the place of women in politics. Also covers political action to promote women's issues and modern feminism. *Prereq. POL U150 is recommended.*
- POL U380 Latino Politics in the United States 4 SH
Focuses on the largest minority in the United States, Latinos. Explores the unique aspects of this group within the U.S. political system in addition to shared experiences with other minority groups, particularly African Americans. Topics include bilingualism, immigration, relations with other racial and ethnic groups, and relations with other countries of origin. *Prereq. POL U150.*
- POL U385 U.S. Health and Welfare Policy 4 SH
Examines social welfare policy with an emphasis on the United States. Reviews a theoretical framework for analyzing social welfare policymaking, then focuses on the areas of welfare and poverty, health care, mental health, and Social Security. Is concerned both with substantive program issues and the design, administration, and implementation of policy in the American sociopolitical context. *Prereq. POL U150.*
- POL U390 Science, Technology, and Public Policy 4 SH
Considers the effects of science and technology on politics and policymaking, and how politics influences science and technology. Focuses on the differences between scientific and democratic values and definitions of rationality, the nature of problems, and why some problems are easier to “solve” than others. Examines such issues as nuclear power, genetics, and computer technology. *Prereq. POL U150.*
- POL U395 Environmental Politics 4 SH
Examines the policymaking processes, historical and socio-economic factors, political forces, governmental institutions, and global trends that shape environmental policy at national and subnational levels in the United States. Gives attention to a wide range of environmental policy areas, with comparisons made between the United States and other nations. *Prereq. POL U150 is recommended.*
- POL U400 Quantitative Techniques 4 SH
Teaches methods of quantitative analysis including descriptive statistics, hypothesis testing, cross-tabulation, regression, and multiple regression. Develops computer skills through use of the SPSS program. Practical applications of statistical techniques are emphasized by means of examples in political behavior, public policy analysis, public opinion, and others. *Coreq. POL U401. Prereq. POL U150 and MTH U115 or MTH U141.*
- POL U401 Recitation for POL U400 0 SH
Provides small-group discussion format to cover material in POL U400. *Coreq. POL U400.*
- POL U405 International Political Economy 4 SH
Focuses on international political and economic relations. Examines how nations interact in such areas as trade, finance, and labor relations. Includes such topics as the International Monetary Fund, multinational corporations, economic sanctions, military interventions, technology transfer, and foreign aid. *Prereq. POL U160 is recommended.*
- POL U415 Ethnic Conflict in Comparative Politics 4 SH
Analyzes the causes and consequences of contemporary ethnic political violence. Examines selected cases on their importance and their usefulness for understanding ethnic conflict (such as Bosnia, Canada, Northern Ireland, and states of the former Soviet Union). Considers various policies for preventing and resolving ethnic political violence. *Prereq. POL U155.*
- POL U420 War and Political Violence 4 SH
Analyzes the causes and consequences of war and considers ways to prevent it. Also examines the use of terrorism by groups as well as governments, and explores counterterrorism and conflict resolution techniques. *Prereq. POL U155.*
- POL U425 U.S. Foreign Policy 4 SH
Examines the formulation and conduct of U.S. foreign and national security policy, with major emphasis on the period following the end of the Cold War. *Prereq. POL U150 or POL U160.*
- POL U435 Politics in Western Europe 4 SH
Offers a comparative survey of the societies, economies, and political systems in the democracies of Western Europe. Examines governing structures and major political developments within the major European states, as well as major policy issues (such as nationalism, federalism, and environmentalism) and issues of European integration within the European Union. *Prereq. POL U155.*
- POL U440 Politics in Northern Ireland 4 SH
Analyzes contemporary politics in Northern Ireland and the Republic of Ireland. Emphasizes the conflict in Northern Ireland with particular attention paid to the roles played by the United States and Great Britain. Considers lessons for other countries. *Prereq. POL U155 is recommended.*
- POL U441 Third World Political Relations 4 SH
Offers a comparative regional analysis of the political systems of Third World nations of Africa, Asia, Latin America, and the Caribbean. Emphasis is on development strategies; problems of development including national identity, political socialization and participation, national defense, and urbanization; and the positions of Third World nations in the international community. *Prereq. Sophomore standing or above.*
- POL U445 Politics in Central and Eastern Europe 4 SH
Studies the six former Soviet bloc socialist countries, as well as Albania and Yugoslavia, and examines political, economic, social, and international problems of postcommunist development. *Prereq. POL U155.*

- POL U450 Government and Politics in Russia 4 SH
Presents an analysis of the roots of the collapse of the Soviet Union in 1991 and studies problems of political development after Communism. Emphasizes the introduction of democracy, the movement toward a market economy, the reorganization of the military, and the control of interethnic strife. *Prereq. POL U155.*
- POL U455 Russian Foreign Policy 4 SH
Presents an analysis of the goals, methods, and achievements of Russian policy in the post-Soviet era toward Eastern Europe, Western Europe, the Middle East, Central and East Asia, and the United States against the background of Soviet behavior toward these areas in the recent past. *Prereq. POL U155 or POL U160.*
- POL U460 Government and Politics in Africa 4 SH
Explores contemporary politics in African nations south of the Sahara. Studies South Africa, Nigeria, Kenya, and Ethiopia, among others. Examines apartheid, colonialism, Afro-Marxism, chieftaincy, development, and Pan-Africanism.
- POL U465 Government and Politics in the Middle East 4 SH
Approaches the political, economic, military, and ideological factors within the Arab states and Israel, inter-Arab politics, Pan-Arabism, the Arab-Israeli conflict, and the great power rivalry in the region. *Prereq. POL U155.*
- POL U470 Arab-Israeli Conflict 4 SH
Analyzes the effects of the Arab-Israeli confrontation on the internal politics of the Arab states and Israel, Pan-Arab politics, and the role of the great powers in the region. *Prereq. POL U160.*
- POL U475 Government and Politics in Latin America 4 SH
Focuses on political change in governmental systems, political parties, socioeconomic problems, and foreign policies of Latin American states. *Prereq. POL U155.*
- POL U477, POL U478, POL U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- POL U480 Government and Politics in Japan 4 SH
Focuses on the development of Japan's political system since World War II. Examines Japan's political institutions and practice of democracy in the context of its political culture; the interrelationship between business and government; Japan's foreign policy; and business practices and organization. Raises issues concerning Japan's extraordinary economic success and the limitations of Japan as a model for other countries. *Prereq. POL U155.*
- POL U485 Government and Politics in China 4 SH
Focuses on China's political system and addresses issues facing its government including leadership recruitment and succession; economic policies; class and class struggle; political culture; education; and China's participation in the international system. Examines how ideology, development, and culture affect these issues. *Prereq. POL U155.*
- POL U487 Politics of Developing Nations 4 SH
Examines the political, governmental, social, economic, cultural, environmental, and geopolitical dimensions of change in nations regarded as "developing" by international standards. Covers a broad spectrum of types of nations including those in Eastern and Central Europe, but pays particular attention to those in Asia, Africa, and Central and South America. *Prereq. POL U155.*
- POL U500 U.S. Constitutional Law 4 SH
Employs excerpts of United States Supreme Court decisions and other reading materials to analyze some of the theoretical, structural, and substantive issues inherent in and relevant to the American constitutional system. *Prereq. POL U150 and junior or senior standing.*
- POL U505 U.S. Civil Liberties 4 SH
Uses United States Supreme Court decisions and other reading material to examine the substantive and procedural guarantees of the Bill of Rights and the Fourteenth Amendment and their relation to a liberal democratic society. *Prereq. POL U150 and junior or senior standing.*
- POL U510 International Law 4 SH
Focuses on public international law and its key policymaking institutions including the United Nations and the International Court of Justice. Also explores the influence of key regional organizations such as the European Union, Arab League, NATO, and the Organization of American States. Topics include state sovereignty, human rights, diplomatic relations, and treaties. *Prereq. POL U160 and junior or senior standing.*
- POL U515 Democracy in Comparative Politics 4 SH
Assesses the development of democracy in a variety of nations and examines the fundamental problems facing nations in establishing and maintaining democratic forms of government. Explores ways to evaluate democratic institutional performance and the difficulties inherent in making the transition from non-democratic to democratic systems. *Prereq. POL U150 or POL U155 and junior or senior standing.*
- POL U530 Revolution and International Conflict 4 SH
Examines the causes and consequences of revolution, with cases including Russia, China, and Cuba. Also considers internal conflicts, such as civil wars and military overthrows, and analyzes the policy implications for the United States and the international system. *Prereq. POL U160 and junior or senior standing.*

POL U544 Seminar in Black Leadership	4 SH	Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>
Enables students to conduct in-depth studies of significant black leaders—male and female—in a wide range of fields. The main focus is on black leadership in the political arena as elected officials; leaders of pressure groups; leaders of protest organizations, black nationalist organizations, and feminist/womanist groups; and as advisers to political parties and presidential administrations. <i>Prereq. 64 SH toward degree.</i>		
POL U575 Special Topics: U.S. Politics	4 SH	POL U700 Political Science Senior Capstone Course
Analyzes the constitutional, political, economic, and societal dimensions of selected contemporary public issues in U.S. politics. <i>Prereq. POL U155 and junior or senior standing.</i>		2 SH
POL U580 Special Topics: Comparative Politics and International Relations	4 SH	Required of all graduating political science seniors. Emphasizes “lessons learned” in the classroom and in the workplace as the students prepare to enter the next phase of their lives. Topics vary broadly depending on faculty and contemporary events, with emphasis on enabling graduates to think about their place in the world beyond the University. <i>Prereq. Senior standing in political science only.</i>
Analyzes the constitutional, political, economic, and societal dimensions of selected contemporary public issues in comparative politics and international relations. <i>Prereq. POL U155 or POL U160 and junior or senior standing.</i>		POL U900 Special Topics
POL U600 Seminar in United States Government	4 SH	1 SH
Offers an in-depth study of selected topics in government and politics in the United States. <i>Prereq. Senior standing in political science only.</i>		Studies selected topics in government and politics.
POL U605 Seminar in Comparative Politics	4 SH	POL U905 Moot Court
Offers an in-depth study of selected topics in comparative politics. <i>Prereq. Senior standing in political science only.</i>		4 SH
POL U610 Seminar in International Relations	4 SH	Offers students the opportunity to participate in a simulation in which they research existing legal controversies, prepare legal briefs, and present their respective cases before a mock judicial panel. <i>Prereq. POL U500 or POL U510.</i>
Offers an in-depth study of selected topics in international relations. <i>Prereq. Senior standing in political science only.</i>		POL U910 Model United Nations
POL U615 Seminar in Public Law	4 SH	4 SH
Explores the various attempts to give law a satisfactory philosophical foundation and the major critiques of the role of law in modern society. Places special emphasis on the attempt by courts to render justice in various areas of law. The critical issue is whether law is a source of objective and determinate answers to contentious legal questions, rather than merely to personal or political questions. <i>Prereq. Junior or senior standing.</i>		Offers students the opportunity to participate in teams that research assigned nations and represent those nations in a model United Nations role-playing exercise. <i>Prereq. Permission of instructor.</i>
POL U620 Literature and Politics	4 SH	POL U915 Model Arab League
Uses a variety of fictional readings to gain fresh insight into basic political concepts such as power, leadership, socialization, corruption, and electoral competition. Attention is also given to contemporary issues ranging from minority rights to tobacco control, abortion, or gun control. <i>Prereq. Junior or senior standing.</i>		4 SH
POL U625 Seminar in Political Science	4 SH	Offers students the opportunity to participate in teams that research assigned nations and represent those nations in a model Arab League role-playing exercise. <i>Prereq. Permission of instructor.</i>
Offers an in-depth study of selected topics in political science. <i>Prereq. Senior standing in political science or permission of instructor.</i>		POL U921 Directed Study
POL U677, POL U678, POL U679	1 SH each	1 SH
Honors Adjunct		POL U922 Directed Study
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor.		2 SH
		POL U923 Directed Study
		3 SH
		POL U924 Directed Study
		4 SH
		Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Junior or senior standing.</i>
		POL U940 Internship in Politics
		4 SH
		Gives students the opportunity to engage in a political or governmental internship under the supervision of a faculty member with departmental approval. <i>Prereq. 64 SH toward degree.</i>
		POL U942 Internship in American Government
		4 SH
		Gives students the opportunity to engage in a political or governmental internship under the supervision of a faculty member with departmental approval. <i>Prereq. 64 SH toward degree.</i>
		POL U943 Community-Based Research Practicum
		4 SH
		Involves students in applied social research projects that are defined in partnership with local civic, public affairs, and social service groups. Students collaborate on a final report that is presented to the community partner at the end of the course. <i>Prereq. Permission of instructor.</i>

POL U944 Group Internship 4 SH
Offers group internship experience based at varying agency sites as available. Readings and seminar meetings including agency staff and political science faculty members supplement students' organizational assignments. *Prereq. 64 SH toward degree.*

POL U946 Internship in State Government 4 SH
Combines academic studies with part-time work experience in a state or local government agency. Students complete the requirements of an internship in a government office and also attend periodic classes in which work experience and related readings are discussed. *Prereq. 64 SH toward degree.*

POL U951 Experiential Education Directed Study 1 SH
POL U952 Experiential Education Directed Study 2 SH
POL U953 Experiential Education Directed Study 3 SH
POL U954 Experiential Education Directed Study 4 SH
Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement. *Prereq. Permission of instructor.*

POL U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

POL U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. POL U970 and honors program participation.*

PHARMACEUTICAL SCIENCE

BOUVÉ COLLEGE OF HEALTH SCIENCES

PSC U277, PSC U278, PSC U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

PSC U301 Human Physiology and Anatomy 1 3 SH
Provides students with an understanding of the principles of physiology. Discusses physiological information mostly related to cardiovascular, respiratory, digestive, urinary, and endocrine systems. Focuses on the physiological mechanisms of the major organ systems. Physiological information is related to the specific areas of pharmacology. *Coreq. PSC U302. Prereq. CHM U214, BIO U113, and second-year PharmD standing.*

PSC U302 Human Physiology and Anatomy 1—Lab 1 SH
Accompanies PSC U301. Focuses on the anatomy of the major organ systems. Interactive CD-ROMs allow each student to study in-depth the structure of each organ system. *Coreq. PSC U301. Prereq. CHM U214, BIO U113, and second-year PharmD standing.*

PSC U303 Human Physiology and Anatomy 2 3 SH
Continues PSC U301. Provides students with an understanding of the principles of physiology. Discusses physiological information mostly related to cell physiology, muscle physiology, and physiology of the nervous system. Focuses on the physiological mechanisms of the major organ systems. Physiological information is related to the specific areas of pharmacology. *Coreq. PSC U304. Prereq. CHM U214, BIO U113, PSC U301, and second-year PharmD standing.*

PSC U304 Human Physiology and Anatomy 2—Lab 1 SH
Accompanies PSC U303. Covers topics from the course through various experiments. *Coreq. PSC U303. Prereq. CHM U214, BIO U113, PSC U301, and second-year PharmD standing.*

PSC U320 Biochemistry 4 SH
Introduces the structures, functions, and metabolism of amino acids, proteins, carbohydrates, lipids, and nucleic acids. Discusses the mechanisms of enzyme reactions, enzyme kinetics, vitamins, biological oxidation-reduction reactions, and bioenergetics, as well as various inborn errors of metabolism. *Prereq. PSC U301, BIO U113, and CHM U313.*

PSC U330 Immunology 3 SH
Provides students with an understanding of the principles, mechanisms, organs, cells, and molecules of the innate and adaptive immunity. Monoclonal antibodies, organ transplant immunity, hypersensitivity, tolerance, tumor immunity, autoimmunity, and immunodeficiencies are discussed in light of potential therapeutic interventions. Weekly journal club-style presentation of related assigned topic is required. *Prereq. PSC U303, PSC U320, and third-year PharmD standing.*

PSC U340 Pharmacology for the Health Professions 4 SH
Provides the fundamentals of pharmacology to students entering the health professions. Topics include the general principles of drug action, drug distribution, and drug elimination, with attention to the development of reasoning skills necessary to identify, avoid, and solve practical drug-related problems. Drugs are presented according to therapeutic or functional classification. *Prereq. PSC U303 or BIO U119.*

PSC U360 Medical Microbiology 3 SH
Reviews the structure and physiology of bacteria, fungi, parasites, and viruses, and then surveys the members of each of these groups of organisms that commonly colonize and/or cause significant disease in humans. The survey focuses on human organ systems such as skin and mucous membranes, gastrointestinal, respiratory, and urinary tracts, central nervous system, blood and lymphatics, and others. When possible,

demonstration cultures of microorganisms are made available to students, and computer study guides or Kodachrome slide sets are available for review. *Prereq. PSC U320 and third-year PharmD standing.*

PSC U411 Pharmaceutics 1 4 SH
Develops an understanding of pharmaceutical dosage forms, with emphasis on solids, liquids, semisolids, parenterals, inhalation, and novel drug delivery systems. Combines the discussion of pharmaceutical products developed in industry and those compounded in local pharmacies. Focuses on application of mathematical principles and problem-solving skills in pharmaceutical compounding. *Prereq. MTH U141, CHM U313, and PHY U149, and third-year PharmD standing.*

PSC U412 Pharmaceutics 2 4 SH
Continues PSC U411. Examines the physical and chemical properties of the drug as it relates to pharmaceutical product development. Covers concepts of thermodynamics; colligative properties; ionic equilibria and buffers; solubility; complexation and protein binding; reaction kinetics; mass transport; interfacial phenomena and dispersion; and rheology. *Prereq. PSC U411 and third-year PharmD standing.*

PSC U419 Pharmaceutics Laboratory 1 SH
Formulates pharmaceutical dosage forms such as powders, capsules, solutions, suspensions, emulsions, ointments, gels, creams, lotions, and suppositories, and tests the quality of the products in the lab using approved methods of analysis. Also provides an understanding of the physical and chemical properties of drugs as they relate to formulation development through experimental observation of dissolution, stability, and effects of pH and co-solvent on solubility of drugs. *Prereq. PSC U411 and third-year PharmD standing.*

PSC U430 Pharmacokinetics and Biopharmaceutics 3 SH
Focuses on the basic principles and methods of biopharmaceutics and pharmacokinetics. Covers the kinetics of drug absorption, distribution, metabolism, and excretion; linear and nonlinear pharmacokinetics; general concept of one- and two-compartment models with instantaneous (i.v. bolus), zero order (i.v. infusion), or first order (oral administration or i.m. injection) input; evaluation of bioavailability and investigation of the factors affecting drug availability; influence of the route of administration, dosage form, and regimen on bioavailability of drugs; bioequivalence study; multiple dosing kinetics; general approaches to dosage adjustment in renal disease; noncompartmental analysis; and pharmacokinetic-pharmacodynamic modeling. *Prereq. PSC U412 and third-year PharmD standing.*

PSC U477, PSC U478, PSC U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

PSC U501 Pharmacology/Medicinal Chemistry 1 5 SH
Introduces the principles and basic concepts of pharmacology and the general mechanisms of drug action including drug receptor interactions. Discusses the major drug classes affecting the peripheral autonomic and central nervous systems including anxiolytics, sedative-hypnotics, anesthetics, anticonvulsants, neuroleptics, antidepressants, and antimanic agents. Considers therapeutic uses, mechanisms of drug action, and undesirable actions including side effects and adverse reactions. *Prereq. PSC U303 and third-year PharmD standing.*

PSC U502 Pharmacology/Medicinal Chemistry 2 5 SH
Continues PSC U501. Covers the mechanisms of action, structure-activity relationships, therapeutic uses, and adverse effects of drugs including cardiovascular agents, hormones, anticancer drugs, antibiotics, and anti-inflammatory agents. *Prereq. PSC U501 and fifth-year PharmD standing.*

PSC U503 Pharmacology 3 3 SH
Continues discussion of topics introduced in PSC U502. Deals primarily with major drug classes including anti-infective and antineoplastic agents and drugs affecting the gastrointestinal, endocrine, reproductive, and hematopoietic systems. *Prereq. PSC U502.*

PSC U677, PSC U678, PSC U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

PSC U921 Directed Study 1 SH
PSC U922 Directed Study 2 SH
PSC U923 Directed Study 3 SH
PSC U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

PSC U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

PSC U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. PTH U970 and honors program participation.*

PSYCHOLOGY

COLLEGE OF ARTS AND SCIENCES

PSY U100 College: An Introduction 1 SH
Introduces students to the major and field of behavioral neuroscience, and the professional and academic resources available to students at Northeastern University. Introduces students to their faculty, advisers, and fellow students; educates students about the cooperative education program; familiarizes students with undergraduate research and technological resources; and introduces problem-solving and leadership skills, which students need to succeed in school and in their professional endeavors.

PSY U101 Foundations of Psychology 4 SH
Surveys the fundamental principles, concepts, and issues in the major areas of contemporary scientific psychology. Approaches the study of psychology as a method of inquiry as well as a body of knowledge. Emphasizes the biological, behavioral, cognitive, and social factors that influence and regulate learning and motivation; personality dynamics; psychopathology and its treatment; life-span development; sensory and perceptual processes; and communication and social behaviors. The influence of cultural factors on psychological studies and theories are also explored.

PSY U200 Psychology of Women 4 SH
Introduces students with little or no background in psychology to the current theories and research on the psychology of women. Critically examines psychological, biological, and social influences on gender differences, gender roles, and gender stereotypes in light of scientific evidence and individual experience. Assesses their consequences for society. Uses the unique perspective generated in the field of the psychology of women to evaluate the traditional research methods in psychology as well as the major psychological theories formulated to explain women and the differences between women and men. Emphasizes critical thinking skills.

PSY U202 Biological Basis of Mental Illness 4 SH
Examines current hypotheses of brain dysfunction involved in mental illness. Explores the field of biological psychiatry including events in the brain that can be linked to mental disorder. Studies current neurochemical and genetic theories of diseases such as schizophrenia and depression. Emphasizes recent research and critically assesses treating mental disorders biologically, such as with drug therapy.

PSY U204 Psychology of Prejudice 4 SH
Searches for universal characteristics of prejudice by examining its expression toward various minorities including colonized peoples, culturally Deaf people, Hispanic and African Americans, women, gays and lesbians, people with disabilities, and those with status in multiple minorities. Reviews research in social psychology on stereotyping and ethnocentrism for the insight it gives into the nature of prejudice. Uses selected films and student minority advocates to allow class members to hear the authentic voice of targets of prejudice.

PSY U206 Food, Behavior, and Eating Disorders 4 SH
Investigates what starts and stops eating behavior. Examines taste, nutrition, metabolism, the brain, food experiences, and societal factors that control feeding behavior. Emphasizes the biological/psychological interaction in normal eating and in pathological eating, such as anorexia, bulimia, and extreme obesity.

PSY U208 Psychology and the Law 4 SH
Traces the effects of psychological factors through the course of a trial including such issues as accuracy of eyewitness identification, plea bargaining, jury selection, persuasion tactics in the courtroom, presumption of innocence, jury size, jury decision rules, and sentencing and punishment.

PSY U277, PSY U278, PSY U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

PSY U300 Research in Psychology 4 SH
Introduces research methods in psychology such as field research, content analysis, case research, survey methods, simulations, and laboratory experiments. Examines issues of research fairness and evaluating research methods. Explores basic statistical notions including sampling, variability, and correlation. *Prereq. PSY U101 and psychology majors only.*

PSY U320 Statistics in Psychological Research 5 SH
Offers an integrated lecture/lab one-semester course covering descriptive and inferential statistics with a focus on psychological applications. Includes a lab to provide hands-on experience with important concepts. Covers standard material in undergraduate statistics including distributions, central tendency, variability, z-scores, the normal distributions, correlation, regression, probability, hypothesis testing (using the z, t, F, and Chi-square statistics), and confidence intervals. This course should be taken before the end of the sophomore year. *Coreq. PSY U321. Prereq. PSY U101.*

PSY U321 Lab for PSY U320 0 SH
Accompanies PSY U320. Covers topics from the course through various experiments. *Coreq. PSY U320. Prereq. PSY U101.*

PSY U350 Researching Consciousness 4 SH
Introduces the varied scientific approaches to the study of consciousness and the diverse theories of consciousness and the mind. Explores biology and consciousness; drug-induced states of consciousness, dreaming, hypnosis, meditative states, pain perceptions, and anomalistic psychology (that is, near-death experiences and ESP). Examines data, theory, and methodological and conceptual problems. *Prereq. PSY U101.*

- PSY U352 Childhood Mental Illness 4 SH
Focuses on mental illnesses that are first diagnosed in childhood—such as autism, phobias, conduct disorders, and attention deficit disorder. Overviews childhood depression and suicide and disorders of eating and sleeping. *Prereq. PSY U101.*
- PSY U354 Psychology and Film 4 SH
Uses selected films to investigate psychological subjects including human development over the life cycle (particularly childhood and adolescence), family dynamics, sexuality, and psychopathology (trauma, anxiety and eating disorders, and psychosis). *Prereq. PSY U101.*
- PSY U356 Nonverbal Communication 4 SH
Examines the messages we send by posture, facial expression, voice quality, gestures, touch, gaze, and interpersonal distance. Examines origins and consequences of these behaviors as well as differences related to culture, personality, power, gender, and age. *Prereq. PSY U101.*
- PSY U358 Behavior Therapies 4 SH
Offers a study of successful projects that have provided effective remediation and rehabilitation in institutions for the mentally ill, the mentally retarded, and the developing human (schools). *Prereq. PSY U101 or permission of instructor.*
- PSY U360 Applied Mental Health Psychology 4 SH
Introduces the etiology, development, and diagnosis of psychopathology. Lectures, discussions, readings, and assignments focus on various theoretical perspectives on psychopathology. Addresses individual, interpersonal, contextual, and cultural factors contributing to the development of psychopathology. Highlights and discusses specific psychological disorders. Students participate in a “service learning track.” Students are placed in a facility for treating emotionally disturbed children or adolescents, and/or mentally ill adults. Students spend at least three hours each week participating in the milieu and/or treatment hospital of these clients/patients, working under the supervision of a volunteer coordinator and instructor. Weekly discussion groups help students process and learn from their experiences. Required papers focus on integrating practical (service learning) experiences and assigned readings. Fulfills the CAS experiential education requirement for psychology majors. *Prereq. PSY U101 or permission of instructor.*
- PSY U362 Aggression and Antisocial Behavior in Youth 4 SH
Examines maladaptive aggression and antisocial behavior in children and adolescents. Explores the origins, development, outcomes, and treatment of what appears to be a growing epidemic among today’s youth. Topics include the types and prevalence of aggressive and antisocial behavior; the interplay among psychiatric, psychosocial, and psychobiologic processes in etiology; known risk and protective factors; gender variables; and why and how some children “grow out of” aggressive tendencies. Also addresses current approaches to clinical assessment and diagnosis as well as the evidence for widely used psychosocial and pharmacological interventions. *Prereq. PSY U101.*
- PSY U364 Studies in College Eating Behavior 4 SH
Offers students the opportunity to investigate and identify the reasons for the increasing incidence of maladaptive eating behaviors in college populations. Students focus on a specific area of interest including sociocultural, cross-cultural, developmental, and gender factors involved in unhealthy dieting and exercise patterns in college students. Students survey the clinical literature to evaluate current models of intervention and prevention of eating disorders on campus, as well as school policies and strategies to cope with this growing health problem. Introduces participants to such interventions as peer counseling, in-service training to campus residential, athletic, and social organizations, community outreach, as well as development of a referral and resource center. *Prereq. PSY U206 or permission of instructor.*
- PSY U400 Personality 4 SH
Offers a systematic study of the normal personality and its development. Focuses on behavioral, dynamic, social, and cognitive determinants, assessment of personality, and current research topics. Surveys the major theories of personality. *Prereq. PSY U101.*
- PSY U402 Social Psychology 4 SH
Provides an introductory survey of social psychology. Topics include aggression, attribution, attitude formation; and change, attraction, gender and culture, conformity, impression formation, and group processes. *Prereq. PSY U101.*
- PSY U404 Developmental Psychology 4 SH
Examines change throughout the life span in social relationships, emotional functioning, language, cognition, and other psychological domains, with emphasis on infancy through adolescence. Introduces major theories of development. Stresses the interaction of social and cognitive factors in development, and the interaction of the developing person with the environment. Also explores individual and cross-cultural differences in patterns of development, and research issues in developmental psychology. *Prereq. PSY U101.*
- PSY U406 Abnormal Psychology 4 SH
Surveys patterns of psychological abnormality. Addresses diagnosis, theoretical perspectives, anxiety, and defense mechanisms. Examines the symptomatology, etiology, and treatment of a number of disorders including anxiety, dissociative, somatoform, affective (depression, mania), and schizophrenic disorders. *Prereq. PSY U101.*
- PSY U450 Learning and Motivation 4 SH
Offers an introduction to the basic learning and motivational principles that permit humans and animals to adapt effectively to a changing environment. Emphasizes research and theories of operant and Pavlovian conditioning, with discussions of discriminations and generalization; avoidance and punishment; acquired motivational states (for example, addiction); concept formation; biological constraints on learning and behavior; animal cognition; and other related topics. Relates learning

and motivational principles to the understanding and treatment of behavioral, affective, cognitive, and motivational disorders.

Prereq. PSY U101.

PSY U452 Introduction to Sensation and Perception 4 SH

Discusses how our five senses work to aid us in perceiving states of the body and of the world, how our perceptions are modified by what we know and expect, and how sensation and perception develop (especially in infancy). Includes discussion of neural and anatomical bases of sensation and perception.

Prereq. PSY U101 or permission of instructor; PSY U458 is highly recommended.

PSY U458 Psychobiology 4 SH

Focuses on the relation between brain function and human behavior. Examines how nerve cells function individually and work together both in small networks and in the nervous system; the structure of the nervous system; how our sense organs provide the nervous system with information about the outside world; how the brain controls movement; and how psychological concepts from motivation to language and memory are represented in the brain. *Prereq. PSY U101.*

PSY U464 Psychology of Language 4 SH

Provides a basic introduction to psycholinguistics. Topics include the nature and structure of languages, processes involved in the production and comprehension of language, the biological bases of language, and aspects of language acquisition. Examines current theories of language processing and related experimental findings. *Prereq. PSY U101 or permission of instructor.*

PSY U466 Cognition 4 SH

Provides a basic introduction to human cognition. Topics include pattern recognition, attention, memory, categorization and concept formation, problem solving, and aspects of cognitive development. Examines current theories of cognitive processing and related experimental findings. *Prereq. PSY U101 or permission of instructor.*

PSY U477, PSY U478, PSY U479 1 SH each
Honors Adjunct

Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

PSY U500 Industrial/Organizational Psychology 4 SH

Surveys the psychological fundamentals underlying performance in work settings. Topics include psychological testing; performance evaluation; training, motivating, and leading employees; and the social psychology of organizations. Emphasizes ethical and affirmative action issues. *Prereq. PSY U402.*

PSY U502 Social-Personality Roundtable 4 SH

Develops skills in conceptualization and discourse on current topics in social and personality psychology. Uses discussion, readings, and topical papers to promote critical thinking in social/personality psychology. *Prereq. PSY U400 or PSY U402.*

PSY U510 Psychopharmacology 4 SH

Examines interactions between drugs, brain, and behavior. Focuses on such topics as synaptic transmission, behavioral functions of specific neurotransmitter systems, pharmacological treatment of mental and neurological disorders, and drug abuse. *Prereq. PSY U458 or equivalent or permission of instructor.*

PSY U512 Neuropsychology 4 SH

Examines the behavior of neurological patients and normal patients to develop an understanding of how the human brain works to produce higher mental functions. Topics include discussions of brain scans, human neuroanatomy, cerebral lateralization, language, memory, neurological disorders, and neural plasticity and recovery of function. *Prereq. PSY U458.*

PSY U520 Language and the Brain 4 SH

Focuses on language behavior from a neuropsychological viewpoint. Examines models of how the brain controls the production and comprehension of language. Considers localization of cerebral functions and hemispheric lateralization; experimental and clinical evidence for functional models; aphasia, dyslexia, and other language pathologies; and evidence from neuroimaging studies. *Prereq. PSY U464, LIN U464, PSY U466, or LIN U466.*

PSY U522 Psychology of Reading 4 SH

Provides an overview of issues in the psychology of reading. Topics include the nature of the reading process as a perceptual and cognitive activity, eye movement patterns in reading, stages of reading development, and dyslexia. Examines current theories of reading and text comprehension. *Prereq. PSY U464, LIN U464, PSY U466, or LIN U466.*

PSY U524 Language and Cognitive Development 4 SH

Explores language and thought in infancy and childhood, how those processes change with age, and theoretical explanations for those changes. Language topics may include speech perception, word meaning, morphology and syntax, critical period, and language impairments. Cognitive topics may include object perception, memory, categorization, reasoning, problem solving, social cognition, and conceptual change. Emphasis may vary by semester. *Prereq. PSY U464, LIN U464, PSY U466, or LIN U466.*

PSY U526 Categorization and Reasoning 4 SH

Examines one of the basic goals of cognitive psychology, which is to describe categorization—how humans organize what they know—and reasoning—how they use what they know to make guesses about what they don't know. Gives an in-depth look at psychological research and theory relevant to these issues. Topics include similarity; categorization; models of conceptual structure; inductive and deductive reasoning; mental models, problem solving; and expertise. *Prereq. PSY U464 or PSY U466.*

- PSY U530 Sensation 4 SH
Overviews the study of our senses, with emphasis on vision, hearing, touch, taste, and smell. Focuses on how we measure our sensory abilities and relates findings to the functioning of sensory organs—eyes, ears, skin, mouth, and nose—and of the sensory nervous system. *Prereq.* PSY U452.
- PSY U532 Perception 4 SH
Offers a study of our awareness of the world around us, with an emphasis on visual and auditory perception. Covers perception of light, sound, space, form, motion, auditory scene analysis, and one or more of color, attention, music, and speech perception. Discusses biological reductionism, Gestalt theory, Gibson's direct perception theory, and Marr's computational theory. *Prereq.* PSY U452.
- PSY U534 Human Factors in Psychology 4 SH
Introduces the application of information about human characteristics and behavior to the design of machines, environments, and systems. Emphasis is on the sensory, perceptual, and cognitive characteristics of people (for example, their ability to respond to differently colored warning lights, recall instructions, and make appropriate decisions), and how those characteristics interact with technological systems. Topics may include decision making, displays and warning signals, control devices, human-computer interaction, aviation and other transportation systems, consumer products, and medical systems. *Prereq.* PSY U452.
- PSY U536 Developing Education and Intervention Programs for Eating Disorders 4 SH
Offers students the opportunity to apply the concepts learned in PSY U364 about eating disorders in college populations to their own and neighboring campuses. Students conduct a research project in which they design and implement an education, information, and prevention program for at-risk populations including school athletes, dormitory residents, and students coping with academic and social stresses. Students interested in early intervention focus on middle and high school curriculum, while other students develop media, Internet, and other educational materials designed to promote awareness and behavioral change. *Prereq.* PSY U364.
- PSY U600 Research Design in Psychology 4 SH
Addresses the theoretical concepts, design, execution, analysis, and communication of research in psychology. Provides students with various methods to acquire hands-on experience performing a research project of their own creation. Students move systematically through the research process, from refining their original idea in the context of existing literature to interpreting and communicating their results. *Prereq.* PSY U320 and research-area course.
- PSY U602 Experiments in Learning and Motivation 4 SH
Offers students the opportunity to assess the generality, specificity, and robustness of learning and motivational principles, through field experiments with free-ranging feral animals. Designs and conducts experiments and writes reports on operant and Pavlovian conditioning, motivation, and related topics. Focuses on the theoretical and clinical implications of experimental findings. This course does not use laboratory animals. *Prereq.* PSY U320 and PSY U450 or permission of instructor.
- PSY U604 Laboratory in Learning and Motivation 4 SH
Gives students the opportunity to gain proficiency, through direct experience, in lab analysis of behavior, and in evaluating common generalizations about human behavior. Students design and perform experiments in animal and human learning, memory, decision processes, concept formation, and other topics of individual interest. *Prereq.* PSY U320 and PSY U450.
- PSY U606 Laboratory in Psychobiology 4 SH
Introduces the methods of research in psychobiology. Students work in small groups, conducting three to four hands-on laboratory exercises under supervised conditions. Students read selections of the relevant scientific literature, analyze the collected data, and write experimental reports. *Prereq.* PSY U320 and PSY U458.
- PSY U608 Laboratory in Animal Behavior Research 4 SH
Offers students the opportunity to examine key concepts and principles in comparative psychology by conducting field studies at a local zoological park. On-site research is integrated with discussions and readings that identify similarities and differences in the ways that individuals and species adapt behaviorally to their ecological conditions. Topics include adaptive specializations in learning and intelligent behaviors; the advantage of living in a social group; animal communication; cooperation and aggression; and the adaptive roles of males and females. Provides students with some of the basic skills of animal behavior research using a variety of observational tools and strategies. Collecting and analyzing data as well as writing scientific reports on the research projects are important evaluative components of the course. *Prereq.* PSY U320 or permission of instructor.
- PSY U610 Laboratory in Psycholinguistics 4 SH
Provides students the opportunity to acquire firsthand experience in conducting research on issues in the psychology of language. Focuses on experiments and their implications for broader issues of language processing. Involves students in all aspects of each experiment including collecting and analyzing data and preparing lab reports. *Prereq.* PSY U320 and PSY U464, LIN U464, PSY U466, or LIN U466.
- PSY U612 Laboratory in Cognition 4 SH
Provides students the opportunity to acquire firsthand experience in conducting research on issues in human cognition. Focuses on experiments and their implications for broader issues of cognitive functioning. Involves students in all aspects of each experiment including collecting and analyzing data and preparing lab reports. *Prereq.* PSY U320 and PSY U464, LIN U464, PSY U466, or LIN U466.

- PSY U614 Laboratory in Social Psychology 4 SH
Provides an introduction to the methods of social-psychological research. Assists students in developing the ability to read published social research with a critical eye, to pose questions in a testable manner, to apply experimental methods to social research, and to express themselves in APA journal style. *Prereq. PSY U320 and PSY U402.*
- PSY U616 Laboratory in Personality 4 SH
Provides an introduction to the methods and areas of personality research. Discusses problems of measurement, control, and interpretation. Critically examines representative published experiments. Students design, collect data for, assess, and write up several experiments. *Prereq. PSY U320 and PSY U400.*
- PSY U618 Laboratory in Community Psychology 4 SH
Provides an introduction to community psychologists, who study people in their social contexts, emphasizing the mutual influence that individuals and communities have upon each other. Rather than attempt to understand and treat problems at the individual level, research in community psychology aims to offer practical solutions to social problems, with a focus on prevention. Students become familiar with some of the research methods employed by psychologists and other scientists working in this area. Students also become familiar with a particular community, which they utilize for data collection. Students develop survey instruments/interview schedules, collect data, and analyze and interpret the findings with a qualitative design if possible. Fulfills the College of Arts and Sciences experiential education requirement for psychology majors. *Prereq. PSY U320 and PSY U406.*
- PSY U620 Laboratory in Industrial/Organizational Psychology 4 SH
Provides students with a basic understanding of the types of qualitative and quantitative research conducted in industrial/organizational psychology. Students participate in realistic business projects in which they play the role of business consultants. These projects involve reading articles from the relevant industrial/organizational literatures, planning studies, collecting and analyzing data, writing up reports, and presenting results to the class. *Prereq. PSY U320 and PSY U500.*
- PSY U622 Laboratory in Sensation and Perception 4 SH
Focuses on experiments using psychophysical methods in the various senses, typically including audition, vision, and others. Students collect data on themselves, analyze the data statistically, and write reports. Critical thinking is stressed. *Prereq. PSY U320 and PSY U452.*
- PSY U650 Seminar in Clinical Case Study 4 SH
Offers students' reflection upon the clinical case-study notes and personal journal entries made during the preceding clinical co-op experience. Students are expected to identify and research the psychological, neuropsychological, systemic, and behavioral aspects of disorders (such as mental retardation, eating disorders, schizophrenia) that they encountered. Evaluates proficiency in applying theoretical perspectives to research through written and oral reports. Fulfills the College of Arts and Sciences experiential education requirement for psychology majors. *Prereq. Permission of instructor.*
- PSY U652 Seminar in Ethics in Psychology 4 SH
Allows students to identify and reflect upon ethical concerns (that is, related to confidentiality, animal use, racism, designing and applying research) that they encountered in their prior co-op/research experiences. Considers historical, psychological, philosophical, sociological, and spiritual perspectives. Students use reflective conversation to guide their ethical thinking, research, and problem solving. Evaluates research projects through written and oral reports. Fulfills the College of Arts and Sciences experiential education requirement for psychology majors. *Prereq. Any professional related experience (for example, co-op, directed study) in psychology or related discipline (education, HRM).*
- PSY U654 Seminar in Behavioral Modification 4 SH
Discusses topics in behavior modification in a seminar format. *Prereq. PSY U358 or PSY U450.*
- PSY U656 Seminar in Psychobiology 4 SH
Offers intensive study, discussion, and practice in lab studies of physiological variables. Covers evolution of the nervous system; neurological disorders; motivation and emotion; sleep; attention and perception; learning; and memory. *Prereq. PSY U458 or permission of instructor.*
- PSY U658 Seminar in Psycholinguistics 4 SH
Offers intensive study and discussion of issues in the psychology of language. Specific topics vary by semester. *Prereq. PSY U320 and PSY U464, LIN U464, PSY U466, or LIN U466.*
- PSY U660 Seminar in Cognition 4 SH
Offers intensive study and discussion of issues in cognitive psychology. Specific topics vary by semester. *Prereq. PSY U320 and PSY U464, LIN U464, PSY U466, or LIN U466.*
- PSY U662 Seminar in Personality 4 SH
Offers intensive study and discussion of issues in personality psychology. Allows students to examine selected topics and present their findings in class. *Prereq. PSY U400.*
- PSY U664 Seminar in Social Psychology 4 SH
Provides an in-depth analysis of specific topics in social psychology. Students read original research and theory papers involving these topics, make presentations, and write papers related to their readings. *Prereq. PSY U402 or permission of instructor.*
- PSY U666 Seminar in Clinical Psychology 4 SH
Focuses on psychotherapy including theory, methods, and outcome research. Provides an overview of clinical psychology including history, ethical and legal issues, the therapeutic relationship, cross-cultural counseling, and the process of change. Students write and present papers on a topic of interest. *Prereq. PSY U406.*

PSY U668 Seminar in Sensation and Perception	4 SH	with a department adviser for guidance in locating the most appropriate faculty person, at least one semester before the study is undertaken. <i>Prereq. Permission of instructor.</i>
Expects students to present in class on topics such as how perceptions are organized, formed, and modified by sensory, attentional, motivational, and cognitive factors; how our sensory systems extract information from the environment in a consistent and logical manner, despite large changes in environmental conditions; and how to account for this in physiological terms. <i>Prereq. PSY U452.</i>		
PSY U670 Seminar in Research Psychology	4 SH	PSY U940 Internship in Psychology
Offers students the opportunity to study and discuss intensively research literature and issues in one of the department's areas of research specialization (for example, animal behavior, language and cognition, psychobiology, personality/social, and sensation and perception). With permission of the experiential education adviser, can be used to fulfill the College of Arts and Sciences experiential education requirement for psychology majors. <i>Prereq. Some laboratory course work or previous directed study.</i>		4 SH
PSY U672 Seminar in History and Theories of Psychology	4 SH	Offers supervised experiences in the application of psychology in instructional, clinical, or other applied settings. <i>Prereq. Junior or senior standing in psychology, minimum GPA of 3.000, and permission of the department.</i>
Presents in an historical context the core ideas and theoretical positions encountered by students in previous courses. Examines different systematic orientations such as structuralist, functionalist, Gestalt, psychoanalytic, behaviorist, cognitive, and humanistic psychology to demonstrate the extent to which the systems influence contemporary American psychology. <i>Prereq. Junior or senior standing in psychology or permission of instructor.</i>		PSY U951 Experiential Education Directed Study
PSY U677, PSY U678, PSY U679	1 SH each	4 SH
Honors Adjunct		Offers a supervised, scholarly research project that is inspired by an approved, prior directed study, independent study, or co-op experience. Restricted to students who are using it to fulfill the experiential education requirement. <i>Prereq. Approved, prior directed/independent study or co-op.</i>
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>		PSY U952 Experiential Education Independent Study
PSY U921 Directed Study	1 SH	4 SH
PSY U922 Directed Study	2 SH	Offers a supervised, scholarly research paper that is inspired by an approved, prior directed study, independent study, or co-op experience. Restricted to students who are using it to fulfill the experiential education requirement. <i>Prereq. Approved, prior directed/independent study or co-op.</i>
PSY U923 Directed Study	3 SH	PSY U962 Psychology Adjunct
PSY U924 Directed Study	4 SH	1 SH
Offers empirical research under the direction of the psychology department, usually on a laboratory or field-based research project under the supervision of a faculty member. Requires a research paper, oral presentation, or poster presentation of the student's work. Interested students should consult directly with the research faculty member or with a departmental adviser for guidance, at least one semester before the directed study is undertaken. <i>Prereq. Permission of instructor.</i>		Offers students, under the guidance of a faculty member, the opportunity to work on any of the following projects with a minimum time commitment of three hours per week: Explore the experiential component of the experiential education requirement; continue the academic exploration of a previous course subject; or develop specialized skills or materials related to career goals. <i>Prereq. Permission of instructor.</i>
PSY U934 Independent Study	4 SH	PSY U963 Co-op Integration Adjunct
Offers a reading course for the student who wants guidance in the archival exploration and in-depth study of a topic of interest. Conducts study through a series of individual tutorials or discussions with a faculty member that typically involve an extensive, analytical review of the literature. Interested students should consult directly with the relevant faculty member or		1 SH
		Offers a one-credit course that covers different topics each semester it is offered. Open only to students on co-op assignments. Participants explore such topics as ethics, diversity, and professionalism in the context of their current work environments. Each course may have both an online and classroom component. <i>Prereq. Permission of instructor.</i>
		PSY U970 Junior/Senior Project 1
		4 SH
		Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. <i>Prereq. Honors program participation.</i>
		PSY U971 Junior/Senior Project 2
		4 SH
		Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. <i>Prereq. PSY U970 and honors program participation.</i>

PHYSICAL THERAPY

BOUVÉ COLLEGE OF HEALTH SCIENCES

PTH U201 Foundation of Physical Therapy 3 SH
Introduces basic patient-care procedures and professional behaviors used in physical therapy practice. Prepares students for co-op education experiences and discusses implications for career planning. *Coreq. PTH U202.*

PTH U202 Lab for PTH U201 1 SH
Accompanies PTH U201. Covers topics from the course through various experiments. *Coreq. PTH U201.*

PTH U203 Human Skills Development 2 SH
Examines typical skill development and maturation from intrauterine life through old age (senescence). The interaction of system development on acquisition of and changes in skill development are considered. Students apply developmental concepts to case studies and hypothetical clinical situations. Emphasizes childhood and early adult development as a foundation to the changes that occur later in adulthood and senescence.

PTH U204 Therapeutic Modalities 1 SH
Provides application of physical agents to treat a variety of impairments found during a physical therapy examination. The theory, rationale, and application of thermal, electrical, light, and mechanical agents are covered. *Coreq. PTH U205.*

PTH U205 Lab for PTH U204 1 SH
Accompanies PTH U204. Covers topics from the course through various experiments. *Coreq. PTH U204.*

PTH U277, PTH U278, PTH U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

PTH U301 Gross Anatomy 4 SH
Covers the structure and function of the human body with particular emphasis on the skeletal, muscular, nervous, and cardiovascular systems and clinical application to these systems. Considers basic abnormalities of structure and function. Involves lectures, cadaver prosection, osteology, and surface anatomy labs. *Coreq. PTH U302. Prereq. BIO U119.*

PTH U302 Lab for PTH U301 1 SH
Accompanies PTH U301. Covers topics from the course through various activities. *Coreq. PTH U301.*

PTH U303 Kinesiology 3 SH
Involves the study of movement through analysis of joint and muscle function. Covers basic kinesiology concepts as well as concepts related to pathological motions and/or postures. Such pathological concepts include gait analysis, soft tissue

pathologies, overuse syndromes, and neurologic disorders. Emphasis is on detailed analysis of the various motions and postures encountered in the clinical setting. Offers students an opportunity to learn to describe the etiology and treatment of normal and abnormal movements and postures. *Coreq. PTH U304. Prereq. BIO U119.*

PTH U304 Lab for PTH U303 1 SH
Accompanies PTH U303. Covers topics from the course through various activities. *Coreq. PTH U303.*

PTH U305 Physical Therapy Professional Seminar 1 2 SH
Examines professional behavior concepts including consideration of ethical and legal issues. Promotes an understanding of personal values, beliefs, and attitudes as they impact on the interpersonal relationships in the professional environment. Includes reflections and cooperative education experiences. *Coreq. PTH U201.*

PTH U308 Neuroscience 4 SH
Covers the structure and physiological function of the human nervous system with emphasis on the clinical aspects of motor and somatosensory systems. The anatomy of the brain, brain stem, and spinal cord is studied in specimens and slides and integrated with the basic physiology of motor and sensory systems. The application of neuroscience to clinical neurological cases is a foundation of this course. *Coreq. PTH U309. Prereq. PTH U301.*

PTH U309 Lab for PTH U308 1 SH
Accompanies PTH U308. Covers topics from the course through various experiments. *Coreq. PTH U308.*

PTH U310 Pathology 4 SH
Covers general medicine, lab medicine, and pathology as related to conditions commonly treated by health-care professionals. Provides the foundation for Differential Diagnosis in Clinical Science courses for the physical therapy professional program. *Prereq. PTH U301.*

PTH U400 Motor Control 3 SH
Focuses on the theories and models of neuromuscular control and learning of human movement. Students examine the relationship between theory and practice and how motor function may be altered by a variety of factors. *Prereq. PTH U303.*

PTH U404 Psychosocial Management 2 SH
Examines the diverse and cultural variations on patients/clients' responses to disability and illness. Offers students the opportunity to reflect on the provider's behavior in relation to clients' behaviors. *Prereq. PSY U404.*

PTH U477, PTH U478, PTH U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

PTH U502 Research Covers research design and literature review. Epidemiology and other advanced research designs are examined in areas that impact physical therapy. <i>Prereq. MTH U141.</i>	4 SH	PTH U512 Physical Therapy Project 1 Provides students with the opportunity to conduct an independent project under the mentorship of physical therapy faculty in areas such as research, education, clinical practice, administration, or service learning. <i>Prereq. PTH U502.</i>	3 SH
PTH U503 Cardiovascular and Pulmonary Management Discusses physical therapy examination evaluation, interventions, and outcome assessment of common cardiac and pulmonary dysfunctions. Etiology and pathology of common cardiac and pulmonary disorders are discussed. Case-based learning is used to promote synthesis of the material. <i>Coreq. PTH U504. Prereq. MTH U280.</i>	4 SH	PTH U513 Physical Therapy Project 2 Continues PTH U512. Builds on the project begun in the previous course with a final independent project as an outcome. Project outcome may result in a publication or presentation at a national professional meeting in conjunction with physical therapy faculty. <i>Prereq. PTH U512.</i>	3 SH
PTH U504 Lab for PTH U503 Accompanies PTH U503. Covers topics from the course through various experiments. <i>Coreq. PTH U503.</i>	1 SH	PTH U515 Assistive Technology Studies theory and current practice in the use of prosthetics, orthotics, and assisted-living devices. <i>Coreq. PTH U516.</i>	3 SH
PTH U505 Musculoskeletal Management 1 Discusses physical therapy examination evaluation, interventions, and outcome assessment of common musculoskeletal dysfunctions. Case-based learning is used to promote synthesis of the material. <i>Coreq. PTH U506. Prereq. PTH U303.</i>	4 SH	PTH U516 Lab for PTH U515 Accompanies PTH U515. Covers topics from the course through various experiments. <i>Coreq. PTH U515.</i>	1 SH
PTH U506 Lab for PTH U505 Accompanies PTH U505. Allows for practice of tests and measures, joint mobilization, and therapeutic exercise. <i>Coreq. PTH U505.</i>	1 SH	PTH U517 Neurological Management 1 Covers the foundations of the physical therapy examination, evaluation, and intervention with patients with neurological deficits. Includes the etiology, pathology, and medical management of common neurological disorders affecting the adult population. <i>Coreq. PTH U518. Prereq. PTH U400.</i>	4 SH
PTH U507 Clinical Integration 1 Offers synthesis and integration of content taught in previous physical therapy clinical science courses. Case-based learning is used to promote synthesis of the material. <i>Prereq. PTH U503 and PTH U505.</i>	2 SH	PTH U518 Lab for PTH U517 Accompanies PTH U517. Covers topics from the course through various experiments. <i>Coreq. PTH U517.</i>	1 SH
PTH U508 Integumentary Systems Management 1 Discusses physical therapy in the examination, evaluation, diagnosis, intervention, prognosis, and outcome of common skin and lymph disorders. Case-based learning is used to promote synthesis of the material. <i>Coreq. PTH U509. Prereq. PTH U301.</i>	1 SH	PTH U519 Physical Therapy Administration Explores concepts in administration and management applied to physical therapy. Involves seminar and discussion groups. <i>Prereq. PTH U201.</i>	4 SH
PTH U509 Lab for PTH U508 Accompanies PTH U508. Covers topics from the course through various experiments. <i>Coreq. PTH U508.</i>	1 SH	PTH U520 Health Assessment and Wellness Provides an opportunity to promote health and quality of life by providing information on health promotion, wellness, disease, impairment, functional limitations, disability, and health risks. Also provides students with an opportunity to explore their consultative role to business, schools, government agencies, and other organizations.	3 SH
PTH U510 Physical Therapy Professional Seminar 2 Continues PTH U305 and builds on concepts introduced in the earlier course. Students are given the opportunity to reflect on issues in experiential education and prepare for future experiential learning. <i>Prereq. PTH U305.</i>	2 SH	PTH U521 Neurological Management 2 Continues PTH U517. Focuses on children and adults. Discusses the physical therapy management of common disorders affecting the pediatric population along with special topics in the adult neurological population. <i>Coreq. PTH U522. Prereq. PTH U517.</i>	4 SH
PTH U511 Research Seminar 1 Offers a review and discussion of professional journal articles. Students choose articles and lead discussions under the guidance of departmental faculty. Each section of the course focuses on articles representing various aspects of physical therapy practice. Allows for integration and synthesis of concepts learned in research. <i>Prereq. PTH U502.</i>	1 SH	PTH U522 Lab for PTH U521 Accompanies PTH U521. Covers topics from the course through various experiments. <i>Coreq. PTH U521.</i>	1 SH

<p>PTH U523 Musculoskeletal Management 2 4 SH Continues PTH U505. Provides a more in-depth analysis of musculoskeletal management. Comparisons of intervention protocols are an integral component of this course. The lab component allows for practical application of spinal joint mobilization, modalities, ergonomic assessment, functional training, and therapeutic exercise. Uses case-based learning to promote synthesis of the material. <i>Coreq. PTH U524. Prereq. PTH U505.</i></p>	<p>determined by significant events and changes in the field. This course may be taken more than once, as long as topics are different. <i>Prereq. Fifth-year standing.</i></p>
<p>PTH U524 Lab for PTH U523 1 SH Accompanies PTH U523. Covers topics from the course through various experiments. <i>Coreq. PTH U523.</i></p>	<p>PTH U535 Advanced Physical Therapy Topics in Geriatrics 2 SH Provides students with an opportunity to obtain in-depth knowledge in geriatrics and physical therapy. Course topics vary each semester offered. Topics are determined by significant events and changes in the field. This course may be taken more than once, as long as topics are different. <i>Prereq. PTH U505 and PTH U517.</i></p>
<p>PTH U525 Clinical Integration 2 3 SH Continues PTH U507. Offers advanced case-based analysis and comparison of methods used in physical therapy examination and intervention for patients/clients in various settings and in health and wellness programs. <i>Prereq. PTH U517 and PTH U515.</i></p>	<p>PTH U536 Advanced Physical Therapy Topics 2 SH in Cardiovascular/Pulmonary Provides students with an opportunity to obtain in-depth knowledge in cardiovascular/pulmonary physical therapy. Course topics vary each semester offered. Topics are determined by significant events and changes in the field. This course may be taken more than once, as long as topics are different. <i>Prereq. PTH U503.</i></p>
<p>PTH U529 Research Seminar 2 1 SH Continues PTH U511. Reviews and discusses professional journal articles. Students choose articles and lead discussions under the guidance of departmental faculty. Focuses on articles representing various aspects of physical therapy practice. Integrates evidence to support clinical practice. <i>Prereq. PTH U511.</i></p>	<p>PTH U537 Advanced Special Topics in Physical Therapy 2 SH Provides students with an opportunity to obtain in-depth knowledge in a specific physical therapy topic area. Course topics vary each semester offered. Topics are determined by significant events and changes in the field. This course may be taken more than once, as long as topics are different. <i>Prereq. Fifth-year standing.</i></p>
<p>PTH U531 Advanced Physical Therapy Topics in Pediatrics 2 SH Provides students with an opportunity to obtain in-depth knowledge in pediatrics and physical therapy. Course topics vary each semester offered. Topics are determined by significant events and changes in the field. This course may be taken more than once, as long as topics are different. <i>Prereq. PTH U203.</i></p>	<p>PTH U677, PTH U678, PTH U679 1 SH each Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i></p>
<p>PTH U532 Advanced Physical Therapy Topics in Spine 2 SH Provides students with an opportunity to obtain in-depth knowledge in spine and physical therapy. Course topics vary each semester offered. Topics are determined by significant events and changes in the field. This course may be taken more than once, as long as topics are different. <i>Prereq. PTH U505.</i></p>	<p>PTH U921 Directed Study 1 SH PTH U922 Directed Study 2 SH PTH U923 Directed Study 3 SH PTH U924 Directed Study 4 SH Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. <i>Prereq. Permission of instructor.</i></p>
<p>PTH U533 Advanced Physical Therapy Topics in Orthopedics 2 SH Provides students with an opportunity to obtain in-depth knowledge in orthopedics and physical therapy. Course topics vary each semester offered. Topics are determined by significant events and changes in the field. This course may be taken more than once, as long as topics are different. <i>Prereq. PTH U505.</i></p>	<p>PTH U941 Clinical Education 1 6 SH Provides students with opportunities to practice examination, evaluation, and intervention skills previously learned in the classroom and on co-op. Students work under the supervision and guidance of a licensed physical therapist. <i>Prereq. PTH U510.</i></p>
<p>PTH U534 Advanced Physical Therapy Topics 2 SH in Alternative Medicine Provides students with an opportunity to obtain in-depth knowledge in alternative medicine and physical therapy. Course topics vary each semester offered. Topics are</p>	<p>PTH U942 Clinical Education 2 6 SH Continues PTH U941. Provides students with additional opportunities to practice examination, evaluation, and intervention skills learned in the classroom and during the previous course. Students are expected to function at a higher level, requiring less supervision and guidance from a licensed physical therapist than was needed during their first clinical education experience. <i>Prereq. PTH U941.</i></p>

PTH U943 Clinical Education 3 6 SH
Continues PTH U942. Provides students with the opportunity to meet entry-level requirements to practice as a physical therapist. Students continue to practice examination, evaluation, intervention, documentation, and administrative skills under the supervision and guidance of a licensed physical therapist. Students are expected to function at the level of a new graduate by the completion of this experience. *Prereq. PTH U942.*

PTH U944 Clinical Education Integration Seminar 2 SH
Designed for students to develop case studies to integrate clinical experiences during affiliations. *Prereq. PTH U941 or taken concurrently.*

PTH U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

PTH U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. PTH U970 and honors program participation.*

SUPPLY CHAIN MANAGEMENT

COLLEGE OF BUSINESS ADMINISTRATION

SCM U201 Supply Chain Management 4 SH
Analyzes the role and activities of those involved in supply chain management decision making. Emphasizes the importance of transportation planning, inventory control, warehouse management, development of customer service standards, and procurement in the design and operation of supply and distribution systems. Attention is given to the importance of information systems and the Internet in supporting such activities. Special attention is also given to the need to develop close working relationships with managers in other functional areas including manufacturing, information systems, marketing, and international operations. This integrative approach to management is critical in supporting supply chain cost and service improvements.

SCM U277, SCM U278, SCM U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

SCM U301 Global Supply Chain Management 4 SH
Analyzes the managerial activities of those involved in supply chain management operations and planning in companies involved in international commerce. Focuses on contemporary issues that affect the design of international supply chain systems, and examines the current status and future prospects of the modes of international transportation. International trade and development issues are also examined not only from the corporate perspective, but also in terms of government policy development. *Prereq. SCM U201.*

SCM U310 The Transportation Industries 4 SH
Examines the structure, operations, problems, and potential of the several major modes of transportation, and focuses on the interaction between transportation companies and shippers in the marketplace. Explores the major dynamics of the transportation marketplace and their impact on supply chain management. Students are provided with a managerial perspective on controlling what is typically the most expensive component of supply chain management, transportation expenditure. *Prereq. 64 SH toward degree.*

SCM U312 Current Issues in Supply Chain Management 4 SH
Identifies a limited number of important contemporary issues and problems in supply chain management, and explores their nature and significance. Students examine alternative approaches to resolving such problems by analyzing various management options and their implications. Students follow day-to-day developments related to these issues and trace their impact on affected parties. Special attention is given not only to the dynamic nature of this field, but also to management's need to monitor the environment constantly for significant changes. *Prereq. SCM U201.*

SCM U320 Supply and Distribution Strategy E-Commerce 4 SH
Examines the specifics of the supply chain management of companies that conduct business on the Web. The Internet and electronic commerce are revolutionizing the ways in which business is conducted in many industries. Emphasis is on pure-play e-commerce companies, as well as on more established brick-and-mortar companies that have initiated Web-based operations. Covers the importance of exchanges, buying groups, and other Web intermediaries. Considerable attention is also given to the strategic implications of using the Web to support supply chain management activities as a means of competitive differentiation. *Prereq. SCM U201.*

SCM U401 Advanced Problems in Supply Chain Management 4 SH
Identifies and examines important issues that are of strategic importance to executives involved in supply chain management. Emphasizes the decision-making processes and tools employed by those executives in the context of corporate strategic management. While case studies are extensively employed, there is an important independent research component to the course, and research findings are discussed with the class and shared through presentations. Also involves companies and executives from supply chain service providers. *Prereq. SCM U201.*

SCM U477, SCM U478, SCM U479 1 SH each
 Honors Adjunct
 Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

SCM U677, SCM U678, SCM U679 1 SH each
 Honors Adjunct
 Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq.* Honors program participation.

SCM U921 Independent Study 1 SH
 SCM U922 Independent Study 2 SH
 SCM U923 Independent Study 3 SH
 SCM U924 Independent Study 4 SH

Allows students who have received approval to undertake independent study in lieu of any course required in the various concentrations. Students present proposals to an Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study takes place. A copy of the final report prepared by the student is presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from concentration coordinators. *Prereq.* Permission of instructor.

SCM U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq.* Honors program participation.

SCM U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq.* SCM U970 and honors program participation.

GENERAL STUDIES

SCHOOL OF GENERAL STUDIES

SGS U101 Strategic Thinking and Learning 4 SH
 Designed to enhance the academic development of freshmen by strengthening reading, study, and language skills across the disciplines. Emphasizes critical reading and thinking skills such as previewing, finding main ideas and details, outlining, summarizing, classifying information, and locating signal words. Focuses on improving study habits, time management, memory and listening techniques, and note-taking and exam-

taking strategies. Also explores methods for researching, organizing, and writing term papers and for making presentations. Reading and research assignments address the primary theme of the course, forming a personal and social identity.

SGS U102 Strategic Thinking and Learning Seminar 1 SH
 Extends critical reading, study, and research skills through individual and group projects based on student needs and interests. Using literature, essays, films, and textbook selections in connection with other disciplines, students explore the importance of social responsibility and cultural awareness in university and community life. Also addresses the sophomore transition process. *Prereq.* SGS U101.

SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY

BOUVÉ COLLEGE OF HEALTH SCIENCES

SLA U101 Introduction to Speech and Hearing 4 SH
 Offers an overview of disorders of speech and hearing and their treatment, and a review of normal speech and hearing development. Requires clinical observations of persons with speech, language, and hearing disorders.

SLA U102 Language Development 4 SH
 Provides an overview of the development of the language system from birth to adolescence. Students compare different theories of language acquisition and understand their implications for intervention approaches; become familiar with broad developmental stages in infancy and childhood in the domains of motor skills, cognition, social skills, and speech and language, and the connections among these domains; understand the social dynamics between parents and children from which early gestures and prespeech vocalizations emerge; utilize some informal measures of language development covering form, content, and use; and understand broad differences in development in multicultural populations including Asian, Hispanic, and African-American children.

SLA U103 Anatomy and Physiology of the Vocal Mechanism 4 SH
 Offers an in-depth study of the static structure, musculature, and physiology of the speech mechanism. Emphasizes current research in speech physiology.

SLA U200 Phonetics 4 SH
 Introduces students to articulatory, perceptual, and linguistic aspects of speech sounds, and phonetic transcription of normal and disordered speech using the International Phonetic Alphabet. Utilizes lectures, discussions, laboratory exercises, demonstrations, readings, audiotape exercises, problem sets, quizzes, and examinations.

SLA U201 Introduction to Co-op 1 SH
 Prepares students for all aspects of the cooperative education component of their curriculum by comparing the goals and expectations of co-op employer, co-op faculty, and students themselves. Through professional goal exploration, students gain an understanding of the policies and procedures of the Department of Cooperative Education. The spectrum of clinical

settings for speech, language, and hearing professionals is examined as well as current trends in the job market. Effective job search strategies through developing résumés, preparing for interviews, and making informed choices are targeted. Also examines on-the-job scenarios involving problem solving, ethical issues, and confidentiality, and discusses appropriate ways to handle difficult workplace situations.

SLA U202 Neurological Bases of Communication 4 SH
Provides students with the opportunity to acquire a basic understanding of human neuroanatomy and neurophysiology as related to normal aspects of speech, hearing, and language. Central and peripheral nervous system anatomy and physiology are reviewed developmentally from embryologic through the life-span perspectives.

SLA U203 Introduction to Audiology 4 SH
Offers the opportunity to gain knowledge of the physics of sound and the anatomy/physiology of the human hearing mechanism, and how these two areas are interrelated. Familiarizes students with some of the diagnostic tests performed by the audiologist in order to assess the integrity of the hearing mechanism. Concludes with a brief overview of amplification and the rehabilitation process for hearing-impaired individuals.

SLA U205 Speech and Hearing Science 4 SH
Introduces facts and theories related to the physical bases of sound as relevant to speech acoustics; anatomy of the hearing mechanisms; psychoacoustics; and speech perception. While primarily concerned with normal communication, the course also includes discussion of communication disorders. Lab demonstrations and problem sets augment lectures and discussions. *Prereq. SLA U103.*

SLA U277, SLA U278, SLA U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

SLA U477, SLA U478, SLA U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

SLA U500 Language Disorders in Adults 4 SH
Provides students with the foundation needed to work with frequently referred adult-impaired populations across clinical settings. Speech, language, and cognitive-linguistic disorders are typical consequences of acquired central and peripheral nervous system adult impairments. Emphasis is placed on the anatomy/etiology/neurology/physiology of commonly acquired adult communication disorders (including aphasia, apraxia, dementia, dysarthria, and traumatic brain injury), characteristics of these communication disorders, and intervention

approaches (diagnostic and therapeutic). Prevention, outcome, efficacy, and service-delivery considerations are addressed. *Prereq. SLA U102 and SLA U202.*

SLA U501 Language Disorders in Children 4 SH
Covers a variety of common speech and language disorders in children with both biological and environmental foundations. Covers models of speech and language processing, definitions of disorders in relation to those models, and a range of intervention methodologies. Considers issues of bilingualism and bidialectalism and how they impact speech and language learning and academic success. Also considers the implications of these disorders for academic achievement, particularly reading and writing. The course is taught using a case-based approach. A portion of the credit for the course is earned through Web-based learning. *Prereq. SLA U102 and SLA U200.*

SLA U503 Aural Rehabilitation 4 SH
Provides a detailed examination of various approaches to speech reading and auditory training as they apply to children and adults. Offers an integrated approach to management of hearing-impaired individuals. *Prereq. SLA U203.*

SLA U600 Clinical Procedures 4 SH
Reviews principles and procedures of the functional analysis of behavior, and focuses on the application of behavioral theory and research to speech, language, and hearing training. Emphasizes clinical investigation in the experimental analysis of the behavior of communication disorders, and experiences in the application of experimental procedures in assessment and treatment programs. *Prereq. SLA U500 and SLA U501.*

SLA U650 Seminar in SLP and Audiology 4 SH
Offers students a transition into clinical practice. Students develop hands-on skills in either assessment or treatment, understand the ethics of clinical practice, and develop professional communication skills in a clinical setting. *Prereq. SLA U600.*

SLA U677, SLA U678, SLA U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

SLA U701 Clinical Research Directed Study 1 SH
SLA U702 Clinical Research Directed Study 2 SH
SLA U703 Clinical Research Directed Study 3 SH
SLA U704 Clinical Research Directed Study 4 SH
Allows undergraduate students the opportunity to pursue a research interest beyond the confines of a specific course. Under the direction of a faculty adviser, students jointly develop a plan of study. Gives students a first exposure to all or some of the steps of the research process relative to their interest areas, beginning with the formulation of the problem and ending with the dissemination of the findings. *Prereq. Permission of instructor.*

SLA U921 Directed Study 1 SH
 SLA U922 Directed Study 2 SH
 SLA U923 Directed Study 3 SH
 SLA U924 Directed Study 4 SH
 Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

SLA U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

SLA U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. SLA U970 and honors program participation.*

ANTHROPOLOGY

COLLEGE OF ARTS AND SCIENCES

SOA U100 College: An Introduction 1 SH
 Intended for first-year students in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

SOA U101 Peoples and Cultures 4 SH
 Surveys concepts in anthropology (the study of culture). Analyzes a range of societies in terms of such sociocultural institutions as kinship, gender relations, economics, politics, and religion. Examines important political and economic processes, such as colonialism and development, affecting cultures around the world.

SOA U200 On Location in the Middle East 4 SH
 Familiarizes students with Middle East culture and society by way of an anthropological tour of the region. Urban, rural, and pastoral communities are examined, particularly focusing on their response to social change both from within and outside the region. Topics within these three broad spatial divisions include family, kinship, and gender; tourism, business, and livelihoods; and popular culture, religion, and social movement. *Prereq. SOA U101.*

SOA U210 Hot-Button Issues in the Middle East 4 SH
 Considers a number of prominent, headline-grabbing issues that currently preoccupy the Middle East. Topics include Orientalism, gender, Islamic fundamentalism, and the Palestinian-Israeli conflict. Each topic will be approached from a macroscopic perspective, looking at its history and general trends. Then it will be viewed by examining the issue from the microscopic level including biographies, short stories, films, and ethnographies. Classroom discussions and outside assignments concentrate on connecting these different levels and understanding how they mutually affect each other. *Prereq. SOA U101.*

SOA U220 Latino, Latin American, and Caribbean Studies 4 SH
 Offers an interdisciplinary introduction to Latinos and people of Latin American and Caribbean origin in the United States as well as to the regions of Latin America and the Caribbean. Dispels a series of powerful myths associated with U.S. Latinos and in Latin American and Caribbean society, such as racial inferiority, poverty, machismo, and violence. Introduces the construction of Latino, Latin American, and Caribbean identities as well as the politics, economics, history, and culture. *Prereq. SOA U101.*

SOA U277, SOA U278, SOA U279 1 SH each
 Honors Adjunct
 Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

SOA U300 Culture and Anthropological Methods 4 SH
 Examines cultures through some of the discipline's best-known ethnographic works, as well as the anthropologists who did the studies. Emphasis is on getting students to understand how ethnographies are put together, and how the anthropologists bring their perspectives to bear upon the cultural study. Required for anthropology majors. *Prereq. SOA U101 and sophomore standing recommended.*

SOA U302 Sex, Sex Roles, and Family 4 SH
 Examines popular and scientific notions about sex, gender relations, family, and kinship. Examines why our images of family, masculinity, and femininity are not universal by analyzing the patterns of sex roles, sexual practices, and kinship in other cultures. Discusses how and why relations between men and women change during times of socioeconomic and political change. *Prereq. SOA U101 and sophomore standing recommended.*

SOA U305 Global Markets and Local Culture 4 SH
 Discusses selected topics in the socioeconomic transformation of other cultures including urbanization, industrialization, commodity production, and international labor migration. Focuses on the impact of capitalist development on contemporary Third World and postcolonial societies; examines local responses to those changes. *Prereq. SOA U101.*

- SOA U307 Social Movements in the Third World 4 SH
Surveys cultures that are undergoing (or have undergone) social movements in the face of Western influences such as colonialism and globalization. Uses an array of case studies from Latin America, Africa, and North America. *Prereq. SOA U101 and sophomore standing recommended.*
- SOA U310 Individual Culture 4 SH
Explores the role of the individual in his/her cultural setting by looking at life history material in a range of cultural settings. A second major theme looks at the interplay between culture and psychology. *Prereq. SOA U101.*
- SOA U312 The Anthropology of Masculinity 4 SH
Provides a cross-cultural examination of the ways in which social and cultural institutions shape men, and how men respond to those institutions. After studying the ways in which gender is constructed, the ways in which women are distinguished from men, and a history of masculinity, the course explores the range of masculinities that compete with one another for expression. Uses case studies from Latin America, Melanesia, North America, and Africa. *Prereq. SOA U101 and sophomore standing recommended.*
- SOA U315 Myth and Religion 4 SH
Focuses upon the ways in which religion impacts other cultural institutions in select societies. Theories of religion in non-Western societies are surveyed through select case studies. *Prereq. SOA U101 and sophomore standing recommended.*
- SOA U325 War and Aggression 4 SH
Evaluates, by using anthropological investigations, the assumption that aggression is part of human nature and linked to sex differences. Discusses cross-cultural variation in violent behavior and warfare in the context of wider political and economic processes. Analyzes the widespread belief in innate masculine aggression as it relates to contemporary societal violence and militarism. *Prereq. SOA U101 and sophomore standing recommended.*
- SOA U365 Sport, Culture, and Society 4 SH
Looks at the ways in which sport reflects and obscures social and cultural institutions. Half of the course focuses upon American sport, and the rest upon the global character that modern sport has taken on. Case studies are used from the United States, Dominican Republic, Japan, Brazil, and elsewhere. *Prereq. SOA U101 and sophomore standing recommended.*
- SOA U400 Muslims, Jews, and Christians in the Middle East 4 SH
Examines the social and cultural dimensions of the ways in which Islam has related to Christianity and Judaism. Explores the human relationships, mutual consensus, and divisive conflict that have existed among these regional neighbors, both now and historically. Focuses principally on Islam and sees the other two in juxtaposition to it. Examines the social and cultural interactions of these Middle East religions from a historical point of view, stressing the extensive and intertwined relationships all three have experienced through the premodern period. Examines the twentieth-century phenomenon of fundamentalism, itself a product of American modernization, but today a term associated primarily with the Muslim world. *Prereq. SOA U101 and sophomore standing recommended.*
- SOA U412 Language and Culture 4 SH
Focuses on the anthropological study of linguistics. Presents basic theories of sociolinguistics and explores language in its social context. Includes animal communication; language learning; language and mind; cognitive and symbolic anthropology; the ethnography of speaking, speech, and boundaries; multilingualism; language and gender; language and ethnicity; language and social class; and pidgins and creoles. Includes several field assignments. *Prereq. LIN U150 or ENG U150 is recommended.*
- SOA U477, SOA U478, SOA U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- SOA U500 Latin American Society and Development 4 SH
Explores the processes of social, economic, and cultural change in Latin America. While concentrating on the present, traces class formation, agrarian structures, ethnic identity, ceremonial organization, gender roles, and political conflict since the colonial era in a range of countries. Emphasizes the relationship of communities and national political and economic systems. May emphasize Central America and Mexico or countries in South America through case studies. *Prereq. SOA U101 and SOC U101.*
- SOA U505 Native North Americans 4 SH
Explores North American Indian tribes including the Dakota (Sioux), Navajo, Pueblo, Mohawk, and Penobscot, and examines the historical changes that led to their contemporary situation. Focuses on the reservation and its many problems from various viewpoints. *Prereq. SOA U101 and SOC U101.*
- SOA U550 Culture and Survival 4 SH
Examines the problems faced by today's non-Western peoples through various theories of cultural change. Using cross-cultural case studies, analyzes the relationship of governmental policies and economic development priorities to the survival of the self-identified tribal cultures and minorities throughout the world. *Prereq. SOA U101, SOC U101, and 64 SH toward degree.*
- SOA U600 Senior Seminar in Cultural Anthropology 4 SH
Required for cultural anthropology majors. *Prereq. Junior or senior standing in anthropology.*

SOA U677, SOA U678, SOA U679 1 SH each
 Honors Adjunct
 Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

SOA U921 Directed Study 1 SH
 SOA U922 Directed Study 2 SH
 SOA U923 Directed Study 3 SH
 SOA U924 Directed Study 4 SH
 Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

SOA U970 Junior/Senior Project 1 4 SH
 Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

SOA U971 Junior/Senior Project 2 4 SH
 Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. SOA U970 and honors program participation.*

SOCIOLOGY

COLLEGE OF ARTS AND SCIENCES

SOC U100 College: An Introduction 1 SH
 Intended for first-year students in the College of Arts and Sciences. Introduces students to liberal arts; familiarizes them with their major; develops the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps to develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student.

SOC U101 Introduction to Sociology 4 SH
 Explores basic concepts and theories concerning the relation between individuals and society. Emphasizes the influence of culture, social structure, and institutions in explaining human activity. Discusses and analyzes social groups, socialization, community, class, power, and social change, among other substantive issues.

SOC U103 Women's Studies 4 SH
 Surveys the issues and methodologies involved in the interdisciplinary study of women. Examines the political, economic, social, and historical processes that have created both the

image and the reality of women in societies. Guest lecturers provide an overview of the diverse disciplinary approaches to the study of women.

SOC U200 Sociology of Alcoholism 4 SH
 Focuses on social responses to alcohol use. Examines drinking cultures and drinking practices in the United States; processes by which people are labeled "alcoholics"; and the role of agencies of social control, such as the criminal justice system and the health-care system, in labeling and rehabilitation.

SOC U205 Law and Social Justice 4 SH
 Analyzes the impact of the legal system on the creation and perpetuation of criminality in contemporary American society. Devotes particular attention to the study of the creation of criminal law, the judicial process, and the role of law in the gap between crime and social justice. Suitable for students in prelaw, criminal justice, political science, and allied fields.

SOC U210 Class, Power, and Social Change 4 SH
 Focuses on theories of social inequality as applied to the exercise of power and large-scale social change. Examines contemporary events in order to understand power structures.

SOC U220 Sociology of Boston 4 SH
 Examines Boston from the perspectives of environmental development, neighborhood and intergroup relations, institutional services, and symbolic meanings. Explores current issues in the city through term projects. Requires field trips.

SOC U221 Doing Sociology 4 SH
 Takes a research approach to sociology. Focuses on students' participation in their own learning about sociology as a body of knowledge and as a method of studying social life. Requires students to use a computer during the course.

SOC U225 Aging in Society 4 SH
 Focuses on aging and the consequences of population aging. The population of the United States, as in many developed societies, has registered rapid growth in its elderly population. Examines the impact of an aging population on the health-care system, family structure, the retirement system, and the economy. The policy implications of these changes are discussed with consideration of how policies addressing the elderly may affect other groups in society.

SOC U228 Social Problems 4 SH
 Analyzes in both empirical and theoretical terms many of the social problems currently facing Americans. Among these are deepening inequality and poverty among working and middle-class Americans, particularly racial minorities, women, and youth; related problems of racism and sexism; growing unemployment; international ecological crisis; deterioration of the health system; crime; and war and militarism. Strategies and political options for solving these problems are considered.

- SOC U235 Social Psychology 4 SH
 Taught from a sociological perspective, social psychology represents the study of the relationship between the individual and society. Focuses on the ways human behavior is tied to social and cultural contexts, and how individuals shape and are shaped by group interaction. Topics may include socialization and how people develop a “social sense of self”; cross-cultural differences in interactional styles; pressures to conform to roles and stereotypes; identity formation and change, attitudes, interpersonal attraction; and prejudice and discrimination.
- SOC U240 Sociology of Prejudice and Violence 4 SH
 Examines factors in the development and maintenance of prejudice and discrimination. Discusses American race relations, anti-Semitism, sex roles, and stereotyping.
- SOC U241 Sociology of Violence 4 SH
 Examines the interpersonal and structural causes and consequences of violent behavior, from individual acts of aggression to large-scale societal conflict. Topics include multiple homicide, sexual assault, international conflict, hate crimes, juvenile violence, mass media violence, and domestic assault. The relative effectiveness of various interventions at the individual and group levels are discussed.
- SOC U245 Sociology of Poverty 4 SH
 Analyzes American poverty in historical perspective, drawing on comparisons with other countries. Critically evaluates sociological research and theories relating to poverty. Considers causes and effects of poverty as well as societal responses to poverty and its consequences. Suitable for students in applied fields, such as nursing, criminal justice, education, allied health, premed, and prelaw.
- SOC U246 Environment and Sociology 4 SH
 Examines the political economy of the global environmental crisis. Topics vary and include such issues as world resource availability, energy, pollution, ecological degradation in the Third World, environmental policy, and social movements. Involves practical experience in environmental problem solving.
- SOC U247 Urban Social Problems 4 SH
 Focuses on the foundations of urban life in historical perspective. Analyzes relation of city life to environment, population, social organization, technology, and cultural values. Examines growth trends, urbanization, urban planning, and citizen action.
- SOC U255 Sociology of the Family 4 SH
 Focuses on families historically and across cultures and classes. Considers changes in contemporary families in terms of gender, family composition, women’s labor force participation, divorce, cohabitation, and other transformations.
- SOC U256 Violence in the Family 4 SH
 Examines physical, emotional, and sexual violence in families. Covers definitions, prevalence, causes, prevention, and treatment of specific cases of domestic violence as well as social policy issues and problems of legal intervention.
- SOC U259 Women in Jewish Culture 4 SH
 Uses some of the tools of contemporary feminist theory and methodology to focus on questions about the resurgence of ethnic/religious identities in the United States and the meaning of this for contemporary Jewish women. Analyzes the changing relationship of women to Judaism by trying to recover Jewish women’s experiences in America since the turn of the century by looking at some key institutions—work, family, religion, the feminist movement, the media, literature, and film.
- SOC U260 Gender in a Changing Society 4 SH
 Considers why and how gender is constructed in American society, and looks at different theories of gender. Topics include the expression of gender in everyday life; its development in childhood; its centrality in the traditional family and the workplace; and sexuality and its role in violence against women.
- SOC U268 The Social Movements of the 1960s 4 SH
 Considers the social and cultural movements of the 1960s and their origins in the civil rights movement. Examines the opposition to government policies and social norms that developed into the civil rights, student, New Left, antiwar, countercultural, and women’s movements in order to understand their grievances, goals, composition, and impact.
- SOC U270 Race and Ethnic Relations 4 SH
 Focuses on racial and religious groups, particularly with reference to the United States. Places special emphasis on historical development, specific problems of adjustment and assimilation, and present-day problems and trends.
- SOC U272 Social Roles in the Business World 4 SH
 Analyzes the social structure of corporate and business life in contemporary America. Presents and discusses case studies from major accounting and/or industrial firms. Examines the “career line” in the world of business and management, with a special focus on age/sex, racial/ethnic, and class/income barriers.
- SOC U273 Women Working 4 SH
 Considers the fact that differences in the labor force experiences of men and women workers generally go unrecognized, and the work experience most common to women—household work—is rarely analyzed. Covers women’s market and nonmarket activities, their rewards, and their problems, in addition to empirical and theoretical analyses of the work roles of women. Underscores the differences between work experiences of men and women.
- SOC U275 Social Stratification 4 SH
 Explores the causes and consequences of the unequal distribution of prestige, power, and wealth in human societies. Topics may include theories of social stratification; varieties of human stratification systems; various dimensions of stratification (race, gender, and class); and the ideologies used to justify (and criticize) inequalities. While the features of multiple societies are considered, primary emphasis is on the development and contemporary structure of the American class system.

- SOC U276 Sociology of Occupations and Professions 4 SH
Focuses on the meanings of work; division of labor and specialization; analysis of occupational structure and patterns of recruitment, training, and career preferences; and the classic professions and new trends in professionalization.
- SOC U277, SOC U278, SOC U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- SOC U280 Sociology of Work 4 SH
Analyzes dramatic changes occurring in the work lives of Americans and considers the future of American workers within the global economy. Explores emerging labor markets, gender, race, and technology in shaping contemporary American work settings.
- SOC U285 Deviant Behavior and Social Control 4 SH
Explores the conditions under which people categorize others as deviant; processes by which persons so defined are assigned deviant status and assume appropriate roles and self-images; development of deviant careers and their relation to deviant subcultures; and situations in which people transform deviant identity.
- SOC U287 Sociology of Religion 4 SH
Offers a comparative and analytic treatment of religion as a social institution, focusing on the relations between religious organizations and other social institutions, with particular emphasis on the American experience. Analyzes religion as an agent of social change and stability.
- SOC U290 Juvenile Delinquency 4 SH
Examines the sociological and psychological approaches to juvenile delinquency and their implications for a typology of delinquency. Discusses problems of prevention, treatment, and rehabilitation.
- SOC U295 Drugs and Society 4 SH
Offers an introduction to the sociology of drugs. First examines social definitions of drugs, conditions of their use, and socialization into drug use. Then considers deviant drug use and effects of social control on definitions and use. Considers a range of licit and illicit drugs, but major emphasis is on alcohol, marijuana, and heroin.
- SOC U297 Sociology of Popular Culture 4 SH
Presents a sociological analysis of popular culture, focusing on the relationship between popular culture and social institutions such as religion, law, education, economy, and family; the organizations and artistic communities that produce popular culture such as the music industry, advertising, media, and television; and personal and political issues raised by popular culture.
- SOC U300 Social Theory 4 SH
Reviews the dominant theoretical traditions in classical and contemporary sociology, showing the links between the social thought of the eighteenth and nineteenth centuries and current social thought. *Prereq. SOC U101 and two 200-level sociology courses.*
- SOC U320 Statistical Analysis in Sociology 4 SH
Introduces students to data collection, data description, and data analysis in sociology. Examines the application of the principles of measurement, probability, measures of centrality, tests of significance, and techniques of association and correlation to social science data. Statistical software is used to complete assignments. Required for sociology majors. *Prereq. SOC U101 and two 200-level sociology courses.*
- SOC U321 Research Methods in Sociology 4 SH
Introduces students to the range of research methods used by sociologists. Covers experimental research, field research, survey research, and historical-comparative research. Sampling, the rules of evidence in empirical research, research ethics, and the place of values are discussed. Required for sociology majors. *Prereq. SOC U101 and two 200-level sociology courses.*
- SOC U323 Ethnographic Methods 4 SH
Focuses on the practical, ethical, and theoretical issues underlying qualitative field research. Emphasizes firsthand experience with participation, observation, interviewing, note taking, data analysis, and ethnographic writing. Open only to sociology and anthropology majors. *Prereq. SOC U101 and two 200-level sociology courses; sociology and anthropology majors only.*
- SOC U324 Human Services Research and Evaluation 4 SH
Covers basic issues in applied research and the evaluation of services including the purposes of evaluation; ethics; formulating questions and measuring answers; designing evaluations and planning oriented research; utilizing evaluation results; and the turbulent setting of action programs. Suitable for students majoring in human services, sociology, psychology, nursing, health education, and related fields. *Prereq. SOC U101, HS U101, and two 200-level sociology courses.*
- SOC U357 Growth and Decline of Cities and Suburbs 4 SH
Introduces students to the field of urban studies. Focuses on three central issues: how cities and suburbs evolve, what makes a city or suburb a good place to live, and how cities and suburbs are (or are not) planned. Students review the ways in which urban scholars and practitioners study cities and suburbs, their research methodologies, definition of issues, and division of labor among different disciplines. Students explore the roles of individuals, communities, the private sector, and government in planning and shaping the city. *Prereq. Sophomore standing or above.*
- SOC U358 Current Issues in Cities and Suburbs 4 SH
Introduces students to pressing urban issues: urban sprawl, poverty, education, transportation, economic development, and housing, through an intensive analysis of the Boston metropolitan area. The course is cotaught by university faculty and

practitioners in government, community, and nonprofit organizations throughout the metropolitan area. Offers students the opportunity to analyze Boston data, go on outings to see development in progress, talk with urban practitioners about what they do, and conduct research on an urban issue of their choice. *Prereq. Sophomore standing or above.*

SOC U401 Social Policy and Intervention 4 SH
Focuses on study of the formation of social policies in response to social problems: analyzes policies and problems, supporters and opponents of policy change; conditions under which control agencies adopt new policies; and effects of policy change. Particular emphasis is on case studies of social action and legal change. *Prereq. SOC U101, HS U101, and two 200-level sociology courses; HS majors only.*

SOC U402 Feminist Perspectives on Society 4 SH
Examines social science and interdisciplinary feminist literature that focuses on women in families and at work, and that deals with physical issues including violence against women and abortion. Incorporates the perspectives of women of color. Considers and evaluates women's views of social life as well as recognizes the differences among women. *Prereq. SOC U101 and SOC U255, SOC U256, SOC U259, or SOC U278, and one other 200-level course.*

SOC U403 American Society 4 SH
Focuses on American society, culture, and major social institutions: economic, religious, governmental, familial, educational, welfare, and recreational. Examines social classes and stratification, mobility, and individualism. *Prereq. SOC U101 and two 200-level sociology courses.*

SOC U406 Class, Crime, and the Legal System 4 SH
Summarizes the major psychological, social, biological, economic, and political theories about the cause of crime. Applies these theories to the daily operations of the police, courts, and prison system in the United States. Examines white-collar crime and the class bias inherent in the more lenient treatment of elite criminals. *Prereq. SOC U101 and two 200-level sociology courses.*

SOC U415 Society and Culture in Russia 4 SH
Focuses on contemporary Russian society. Emphasizes the social, economic, and political reforms of the Gorbachev period and the ways in which the Soviet Union has evolved since 1917 and in the post-Soviet period. *Prereq. SOC U101 and two 200-level sociology courses.*

SOC U418 Greater Boston Urban Policy Seminar 4 SH
Designed to introduce the advanced undergraduate sociology, political science, or economics student to the broad area of public policy related to the specific problems of large metropolitan areas. Throughout the seminar there will be a focus on Greater Boston. Among the issues discussed are racial attitudes and residential segregation, the urban labor market, housing, urban sprawl and transportation, education, public health, and urban planning. Links between all of these issues are explored. *Prereq. SOC U101, SOC U247, and one other 200-level sociology course.*

SOC U437 Children and Youth in Contemporary Society 4 SH
Presents a sociological discussion of children focusing on race, gender, class, and childhood age as factors that children respond to as they go through their daily lives. Issues such as peer group relations and special problems unique to childhood and their policy implications are also explored. Topics may include foster care, juvenile justice, youth pregnancy, and child labor among other issues. *Prereq. SOC U101 and SOC U103, SOC U255, SOC U256, or SOC U260, and one other 200-level sociology course.*

SOC U440 Sociology of Human Service Organization 4 SH
Introduces selected theoretical perspectives on human service organizations, emphasizing defining organizational goals and effectiveness. Gives students the opportunity to become familiar with the nature of human service organizations, to compare these organizations to business and industrial organizations, to outline specific problems that human service organizations face, and to propose potential solutions. *Prereq. SOC U101, HS U101, and two 200-level sociology courses; HS majors only.*

SOC U442 Sociolinguistics 4 SH
Looks at why people choose to say things in different ways in different situations. In examining language behavior in its social context, this course outlines the linguistic constructs that allow conversation to occur, the types of variation that can occur in registers and dialects, and the possible reasons for choosing different linguistic varieties. Linguistic variation in relation to social context, gender, socioeconomic class, race, and ethnicity are examined. *Prereq. LIN U150 or ENG U150 is recommended.*

SOC U460 Sociology of Latino Society 4 SH
Designed to familiarize students with the Latino population in the United States. Reviews economic, political, and social factors that have contributed to the presence of Latinos in the United States. Sociological perspectives are used to understand the social, economic, and political characteristics of the various Latino groups and how these relate to larger social and economic processes in the U.S. society. *Prereq. SOC U101 and two 200-level sociology courses.*

SOC U470 Social Conflict and Community Service 4 SH
Offers a community service course supported by a grant from a Northeastern alumnus. The primary objective is to assist students in learning about the causes, consequences, and possible solutions for social conflict in the Boston area. Attention is also given to helping students see beyond their customary social experiences. Students work in teams on projects that deal in some way with social conflict, broadly defined. Reflections occur through team interactions, journal summaries, and focused discussions in weekly seminars. Each student writes an analytic paper that ties in sociological issues; some teams produce sets of papers that combine to produce reports for their host organizations. *Prereq. SOC U101 and two 200-level sociology courses.*

SOC U477, SOC U478, SOC U479 1 SH each
Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

SOC U480 Comparative Political Economy 4 SH
Designed to introduce the undergraduate student to competing paradigms in economic thought and public policy. The first third of the course is devoted to a brief overview of the historical, philosophical, and psychological roots of political economic ideology and socioeconomic institutions. The last two-thirds is spent in an inquiry into conservative, liberal, and radical political economic perspectives. Focuses on the role of government in political and economic affairs. Throughout the entire course, special attention is paid to an analysis of current economic conditions and policy in light of the theoretical models explored in class. *Prereq. SOC U101 and two 200-level sociology courses.*

SOC U485 Environment, Technology, and Society 4 SH
Discusses the following questions: Does society control technology or is technology directing society? Has technology become dehumanized? How valid is the doctrine of technological inevitability? Also explores whether the technological “fix” can be viewed as a solution to social problems; if technology itself is a social problem; what can be expected of technology assessment; and whether the back-to-nature and antitechnology movements today are the waves of the future. Expects students to do considerable independent study and research. *Prereq. SOC U101 and two 200-level sociology courses.*

SOC U487 Applied Sociology: Practice and Theory 4 SH
Offers the academic component of the experiential education requirement for sociology majors; to be taken after students have completed the experiential component. Provides a seminar format in which students will reflect upon their approved experience (that is, co-op, internship, community service, and so on) and integrate it into a research project. Students who have completed study abroad or a service-learning course in the department may not have to take this course. *Prereq. SOC U101 and two 200-level sociology courses; sociology majors only.*

SOC U515 Public Policy Seminar 4 SH
Designed to introduce the advanced undergraduate sociology, political science, or economics student to the art and science of public policy development, analysis, and evaluation. The first half of the course is devoted to a consideration of the social, political, and economic roots of public policy. The second half includes an inquiry into a range of issues having to do with the “art and science” of policymaking. A number of case studies are reviewed to provide examples of policy in action. *Prereq. Junior or senior standing.*

SOC U516 Seminar in Urban Sociology 4 SH
Focuses on important topics in the study of urban areas within sociology. Themes include residential segregation, suburbanization, neighborhood development and change, the economic

development of cities, fiscal crisis, gentrification, urban crime, and public and private urban policies. *Prereq. SOC U247 and junior or senior standing in sociology.*

SOC U517 Social Dimensions and Political Debates 4 SH
on Globalization
Surveys contemporary social, political, and cultural issues in the context of globalization, internationalization, and transnationalism. Topics include global feminism, workers’ rights, and the politics of racial inequality in global institutions—for example, the European Union. Also examines political conflicts over globalization, that is, emerging transnational social movements and protests on the global scale. *Prereq. Junior or senior standing in sociology.*

SOC U518 Law and Social Issues 4 SH
Explores the ways in which the legal system shapes and is, in turn, shaped by ideological and political movements. For example, the bitter controversy over whether runaway juries have created “jackpot justice” by awarding huge sums to plaintiffs is a reflection of deep cultural and political divides over individual rights and corporate power. Also examines new legal principles that are currently evolving to deal with such misdeeds as systematic corporate misconduct, cyber crimes, and harassment. *Prereq. Junior or senior standing in sociology.*

SOC U519 Seminar in Social Psychology 4 SH
Explores in depth the ways sociologists study the interaction between individuals and social context. *Prereq. Junior or senior standing in sociology.*

SOC U520 Race, Class, and Gender 4 SH
Considers the intersection of race, class, and gender in social structure, institutions, and people’s lives. Utilizes an interdisciplinary approach to focus on the socially constructed nature of these concepts and how they shape and create meaning in individual lives. Difference with an emphasis on inequality and varying life chances is a central concept for understanding our society and is central to our work. Requires a significant amount of reading and the class is run like a seminar with students expected to participate, take responsibility, and write a paper. *Prereq. Junior or senior standing in sociology.*

SOC U525 American Demographics 4 SH
Offers an applied research experience in which students have the opportunity to study the major areas of demography. Focuses on the resources of the United States Census Bureau and, in particular, the data products available from recent census surveys. *Prereq. SOC U101 and two 200-level sociology courses.*

SOC U528 Computers and Society 4 SH
Examines the impact of the computer revolution on the conditions of work and life in contemporary society including legal and theoretical issues. Discusses ethical and professional issues in computer use. *Prereq. Junior or senior standing with ability to program or permission of instructor.*

SOC U530 Seminar in the Family 4 SH
Explores issues facing contemporary families including combining work and family, single motherhood, fathers and children, family violence, and differences among families of different ethnicities, cultures, and classes. *Prereq. SOC U101 and SOC U255 and one other 200-level sociology course.*

SOC U535 European Union: Social and Political 4 SH
Designed to provide a sociological introduction to the history and development of the common market, institutions, and policies of the European Union (EU). The EU began in the 1950s as a series of agreements on economic issues among a small number of countries, and has evolved to take on a role in various social, economic, and cultural areas in its member states. Emphasizes current challenges, issues, and debates in the EU, for example, the introduction of the euro; common policies areas including gender and racial equality; social policies and labor markets; migration and enlargement; the EU as an emerging international actor; and transatlantic relations. *Prereq. SOC U101 and two 200-level sociology courses.*

SOC U600 Senior Seminar 4 SH
Contact the honors office for details about the course. *Prereq. Senior standing.*

SOC U677, SOC U678, SOC U679 1 SH each
Honors Adjunct
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

SOC U921 Directed Study 1 SH
SOC U922 Directed Study 2 SH
SOC U923 Directed Study 3 SH
SOC U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of department chair; junior or senior standing in sociology.*

SOC U951 Experiential Education Directed Study 4 SH
Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement. *Prereq. Permission of instructor.*

SOC U970 Junior/Senior Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

SOC U971 Junior/Senior Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the

student's major field. Culminating experience in the University Honors Program. *Prereq. SOC U970 and honors program participation.*

THEATRE

COLLEGE OF ARTS AND SCIENCES

THE U100 College: An Introduction 1 SH
Intended for freshmen in the College of Arts and Sciences. Introduces freshmen to the liberal arts in general; familiarizes them with their major; helps them develop the academic skills necessary to succeed (analytical ability and critical thinking); provides grounding in the culture and values of the University community; and helps them develop interpersonal skills—in short, familiarizes students with all skills needed to become a successful university student. *Prereq. Theatre freshmen only.*

THE U101 Theatre Arts 4 SH
Focuses on theatre in performance by examining the work of theatre artists (actors, designers, directors, and playwrights). Introduces students to the dynamics of performance and to the reading of play texts, and provides a brief overview of the development of Western theatre.

THE U120 Acting 1 4 SH
Focuses on fundamental techniques of stage use, the actor and the stage environment, and improvisations for strengthening imagination and increasing freedom of expression. *Prereq. Theatre majors only.*

THE U130 Introduction to Acting 4 SH
Focuses on fundamental techniques of stage use, the actor and the stage environment, and improvisations for strengthening imagination and increasing freedom of expression.

THE U131 Technical Theatre 1 4 SH
Covers the basic skills of technical theatre required for all theatre professionals. Introduces the student to scenery and costume construction, and stage lighting.

THE U210 Theatre and Society 4 SH
Overviews several great practitioners of theatre. In particular, stresses how society influenced the thought and craft of playwrights, actors, directors, designers, and theorists. Pays careful attention to how the play's ideas are translated into performance. Uses video, discussion, and live performance, when possible, as integral elements in the course.

THE U220 African-American Theatre 4 SH
Surveys the history of African-American theatre artists in America from the time of Ira Aldridge to the present day. Also examines the works of African-American playwrights from the Harlem Renaissance to the present, with an emphasis on the period beginning with Baraka's *Dutchman*.

- THE U250 Voice and Movement for Theatre 4 SH
Focuses on vocal and physical exercises that enable the actor to connect with the voice better through freeing the physical and emotional self. Vocal work emphasizes centering, physicalization, breath support, articulation, resonance, and projection. Physical work develops concentration, control, and stamina through exercise, relaxation, improvisation, manipulation of energy flow, rhythms, and imagination. Emphasizes using the body as an expressive instrument. Includes selected monologues and/or scenes for classroom analysis. *Prereq. Theatre majors only or permission of department chair.*
- THE U270 Theatrical Design 4 SH
Introduces the visual aspects of modern theatrical production and the creative processes by which these come into being, through a basic survey of the three major design disciplines, their supporting technology, and their working interrelationship. Addresses how artistic concepts are developed and related, how they are communicated to other artists and an audience, and how one develops the critical processes necessary to evaluate these concepts.
- THE U277, THE U278, THE U279 1 SH each
Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*
- THE U300 Theatre History 4 SH
Explores the history of the theatre and its development in the West, focusing on Greece, Rome, Medieval Europe, Golden Age Spain, Elizabethan and Stuart England, Italian Renaissance, and the spread of Italianate forms throughout Europe during the seventeenth and eighteenth centuries. *Prereq. Sophomore standing or above.*
- THE U310 American Musical Theatre 4 SH
Traces the development of the American musical from *The Black Crook* to the present. Considers the role of musical theatre as both entertainment and serious art form through an examination of script, score, dance, and design. Includes works by composers and lyricists such as Rodgers and Hammerstein, Lerner and Loewe, Cole Porter, Bock and Harnick, Leonard Bernstein, and Stephen Sondheim. *Prereq. Sophomore standing or above.*
- THE U315 Theatre Through the Lens of Modernism 4 SH
Covers seminal playwrights of the nineteenth and twentieth centuries whose works have had a major impact on both modern drama and theatrical methods of production. *Prereq. Sophomore standing or above.*
- THE U320 The American Theatre 4 SH
Traces the historical development of theatre in America, as well as its role as a social institution, economic enterprise, and art form. *Prereq. Sophomore standing or above.*
- THE U325 Script Analysis for the Stage 4 SH
Aids the theatre practitioner in developing the skills necessary for analyzing scripts in preparation for production. Focuses on dramatic theory and structure and theatrical techniques that enable an actor, director, designer, or playwright to uncover the problems of translating theory into practice. *Prereq. Theatre major/minor or permission of department chair.*
- THE U330 Playwriting 1 4 SH
Offers students the opportunity to develop a series of dramatic dialogues that culminate in the writing of a one-act play. Uses a workshop format. *Prereq. Sophomore standing or above.*
- THE U335 Contemporary Theatre 4 SH
Examines the current state of commercial, regional, and other noncommercial theatre in the United States, using readings, lectures, reports, and weekly visits to theatre productions in the area. Explores through lectures the background of these types of theatre in twentieth-century American and European theatre. *Prereq. Sophomore standing or above.*
- THE U342 Acting 2 4 SH
Continues THE U120. Focuses on developing the actor's sense of truth and emotional freedom. Emphasizes creating, developing, and sustaining character and developing ensemble. Includes monologues and scenes performed for classroom analysis. *Prereq. THE U120 and permission of department chair.*
- THE U343 Acting 3 4 SH
Continues THE U342. Focuses on further development of the actor's tools, script and character scoring, research, and exercises for physical and psychological freedom. Deals with scene work from a spectrum of theatrical genres. Includes in-class scenes from works in progress. *Prereq. THE U342 and permission of department chair.*
- THE U344 Intermediate Acting 4 SH
Focuses on developing the actor's sense of truth and emotional freedom. Emphasizes creating, developing, and sustaining character and developing ensemble. Includes monologues and scenes performed for classroom analysis. *Prereq. THE U130 and permission of department chair.*
- THE U345 Acting for the Camera 4 SH
Presents the fundamentals of camera acting, adjusting the actor's physical responses to the mechanical eye of the camera and the delicate ear of the microphone. Involves studio work before the television camera to explore the genres of dramatic, commercial, and industrial acting. *Prereq. THE U120 or THE U130 and permission of department chair.*
- THE U360 Stage Makeup 4 SH
Focuses on the principles of, the reasons for, and the materials used in makeup for the theatre, television, and films. Includes the practical application of types and styles of makeup: straight, old-age, character, and corrective. *Prereq. Permission of department chair.*

THE U365 Technical Theatre 2 Continues THE U131. Covers the intermediate skills of technical theatre required for all theatre professionals. Students pursue more advanced technical skills in areas such as stage makeup and stage management. <i>Prereq. THE U131.</i>	4 SH	THE U550 Concepts of Directing Focuses on purposes and techniques of theatrical direction related to script analysis, production style, pictorial composition, rhythmic evolution, and empathic responses. <i>Prereq. THE U120, THE U270, and permission of department chair.</i>	4 SH
THE U370 Lighting Design for the Stage Examines basic principles and practices of stage lighting including the qualities and functions of light, lighting instruments and controls, basic electricity, color in light, and analysis of the script in terms of light requirements. Expects students to develop light plots and schedules for various kinds of stage productions. Includes lab work on lighting crews for University productions. <i>Prereq. Permission of department chair.</i>	4 SH	THE U570 Musical Theatre Technique Applies acting technique to the performance of musical material. Explores song through text and character progression, develops a process for approaching a song, and synthesizes movement, gesture, and emotion with melody, rhythm, and lyrics. Involves student performances of solo, small ensemble, and large ensemble material. Does not involve singing technique. <i>Prereq. THE U120, THE U342, and permission of department chair.</i>	4 SH
THE U380 Costume Design Presents the beginning designer with the opportunity to investigate costume design theory and to foster perceptual development. Through lectures and projects, gives students the opportunity to explore both the abstract and historical aspects of costume design as well as textual analysis and its conceptual implications. Does not require prior art or design education. <i>Prereq. Sophomore standing or above.</i>	4 SH	THE U600 Advanced Technical Production Allows students the opportunity to acquire and explore the requisite skills for developing working drawings and budgetary analyses for theatrical productions. Focuses on several projects and includes the opportunity to coordinate one substantial production. Requires that the specialized study be executed in close supervision with the instructor. <i>Prereq. All production/design concentration courses and permission of department chair.</i>	4 SH
THE U385 Pattern Drafting and Costume Construction Develops the skills and techniques necessary for the patterning, cutting, and construction of costumes for the stage. Covers flat pattern drafting, draping, and finishing techniques. <i>Prereq. Sophomore standing or above.</i>	4 SH	THE U677, THE U678, THE U679 Honors Adjunct Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each
THE U460 Scenic Design for the Stage Introduces the theory and practice of theatrical design and the role of the designer in the production process. Through project work, examines the use of the graphics tools—line, form, balance, color, rhythm, and so on—in the development of the design idea. Emphasizes understanding and utilizing spatial relationships, visually expressing conceptual themes, and understanding the various uses, problems, and practical considerations of proscenium, thrust, and arena staging. <i>Prereq. Permission of department chair.</i>	4 SH	THE U699 Advanced Television Production Offers students the opportunity for in-depth examination of a subject of particular significance to theatre/television production. <i>Prereq. Permission of department chair.</i>	4 SH
THE U465 Theatrical Drafting Exposes the student to the basic graphics language needed to translate a designer's ideas into technical drawings used for construction, through work on supervised classroom projects. <i>Prereq. Sophomore standing or above.</i>	4 SH	THE U701 Rehearsal and Performance Requires students to research, prepare, and perform either a substantial acting role, a design assistantship, a crew head, a dramaturgy, or a stage-management position under the direction and guidance of faculty. Students are expected to keep a rehearsal log and synthesize and evaluate the experience in a final paper. May be repeated for credit up to three times for theatre majors. Fulfills the College of Arts and Sciences experiential education requirement for theatre majors. Fulfills theatre core. <i>Prereq. Permission of department chair.</i>	4 SH
THE U477, THE U478, THE U479 Honors Adjunct Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. <i>Prereq. Honors program participation.</i>	1 SH each	THE U901 Theatre Practicum 1 THE U902 Theatre Practicum 2 THE U903 Theatre Practicum 3 THE U904 Theatre Practicum 4 Offers lab practice in technical production; may be repeated for credit (maximum three credits). <i>Prereq. Permission of department chair.</i>	1 SH 1 SH 1 SH 1 SH
THE U500 Dramatic Theory/Criticism Examines the major theoretical statements about Western theatre from Greece to the present day. Devotes a significant portion of the course to twentieth-century critical strategies. <i>Prereq. 64 SH toward degree or junior or senior standing.</i>	4 SH		

THE U905 Practicum in Production 5	1 SH
THE U906 Practicum in Production 6	1 SH
THE U907 Practicum in Production 7	1 SH
THE U908 Practicum in Production 8	1 SH

Offers lab practice in rehearsal and performance for production; may be repeated for credit (maximum of four credits).

Prereq. Permission of department chair.

THE U921 Directed Study 1	1 SH
THE U922 Directed Study 2	2 SH
THE U923 Directed Study 3	3 SH
THE U924 Directed Study 4	4 SH

Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. Prereq. Permission of instructor.

THE U954 Experiential Education Directed Study	4 SH
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Draws upon the student's approved experiential activity and integrates it with study in the academic major. Restricted to those students who are using it to fulfill their experiential education requirement. Prereq. Permission of instructor.

THE U970 Junior/Senior Project 1	4 SH
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Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. Prereq. Honors program participation.

THE U971 Junior/Senior Project 2	4 SH
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Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Prereq. THE U970 and honors program participation.

THE U980 Special Topics: Theatre Performance	4 SH
THE U981 Special Topics: Theatre Performance	4 SH
THE U982 Special Topics: Theatre Performance	4 SH

Offers opportunity for in-depth examination of a subject of particular significance to the field. Prereq. Permission of instructor.

THE U983 Special Topics: Theatre History	4 SH
THE U984 Special Topics: Theatre History	4 SH
THE U985 Special Topics: Theatre History	4 SH

Offers opportunity for in-depth examination of a subject of particular significance to the field. Prereq. Permission of instructor.

THE U986 Special Topics: Theatre Design	4 SH
THE U987 Special Topics: Theatre Design	4 SH
THE U988 Special Topics: Theatre Design	4 SH

Offers opportunity for in-depth examination of a subject of particular significance to the field. Prereq. Permission of instructor.

TOXICOLOGY

BOUVÉ COLLEGE OF HEALTH SCIENCES

TOX U101 Toxicology Orientation	1 SH
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Introduces toxicology as it relates to environmental, forensic, and clinical issues. Focuses on general principles of toxicology and their application to determining the hazards of toxicants in the workplace, home, and environment.

TOX U277, TOX U278, TOX U279	1 SH each
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Honors Adjunct
Offers additional introductory academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. Prereq. Honors program participation.

TOX U477, TOX U478, TOX U479	1 SH each
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Honors Adjunct
Offers additional intermediate academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. Prereq. Honors program participation.

TOX U570 Clinical Toxicology	2 SH
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Examines the potential toxicity of drugs, commercial products, and environmental agents. Focuses on clinical manifestations, mechanisms of toxicity, principles of treatment, and prevention of acute and chronic poisonings. Prereq. PSC U501 and permission of instructor.

TOX U572 Environmental Toxicology	3 SH
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Discusses the distribution, interaction, and effects of toxic agents on the biosphere. Applies the results of toxicology investigation to understanding the environment's chemical pollution. Prereq. PSC U301 and CHM U311.

TOX U574 Organ Systems Toxicology	3 SH
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Presents the principles of toxicology from an organ-systems perspective. Focuses on the concepts used to evaluate toxicity, the mode of injury at the organ and cellular level, and the basic subcellular mechanisms through which toxic agents produce damaging effects. Prereq. PSC U501 and permission of instructor.

TOX U576 Experimental Toxicology	3 SH
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Emphasizes the interpretation of toxicological literature. Employs structure activity and biochemical methods of assessment to evaluate mechanisms of toxicity of major classes of chemical compounds. Develops the ability to analyze and interpret data in the literature. Prereq. TOX U574 and permission of instructor.

TOX U578 Biochemical Toxicology Lab	3 SH
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Introduces investigative methods for assessing toxicity. Develops the ability to analyze and interpret data generated in the lab and in the literature, and sharpens technical report-writing skills.

TOX U677, TOX U678, TOX U679
Honors Adjunct
1 SH each
Offers additional advanced academic experience by exploring course-related topics in greater depth with the professor. Available only to courses approved by the University Honors Program. *Prereq. Honors program participation.*

TOX U701 Toxicology Research
3 SH
Offers students participation in faculty-directed projects in the toxicology laboratory. *Prereq. Permission of instructor.*

TOX U921 Directed Study
1 SH

TOX U922 Directed Study
2 SH

TOX U923 Directed Study
3 SH

TOX U924 Directed Study
4 SH

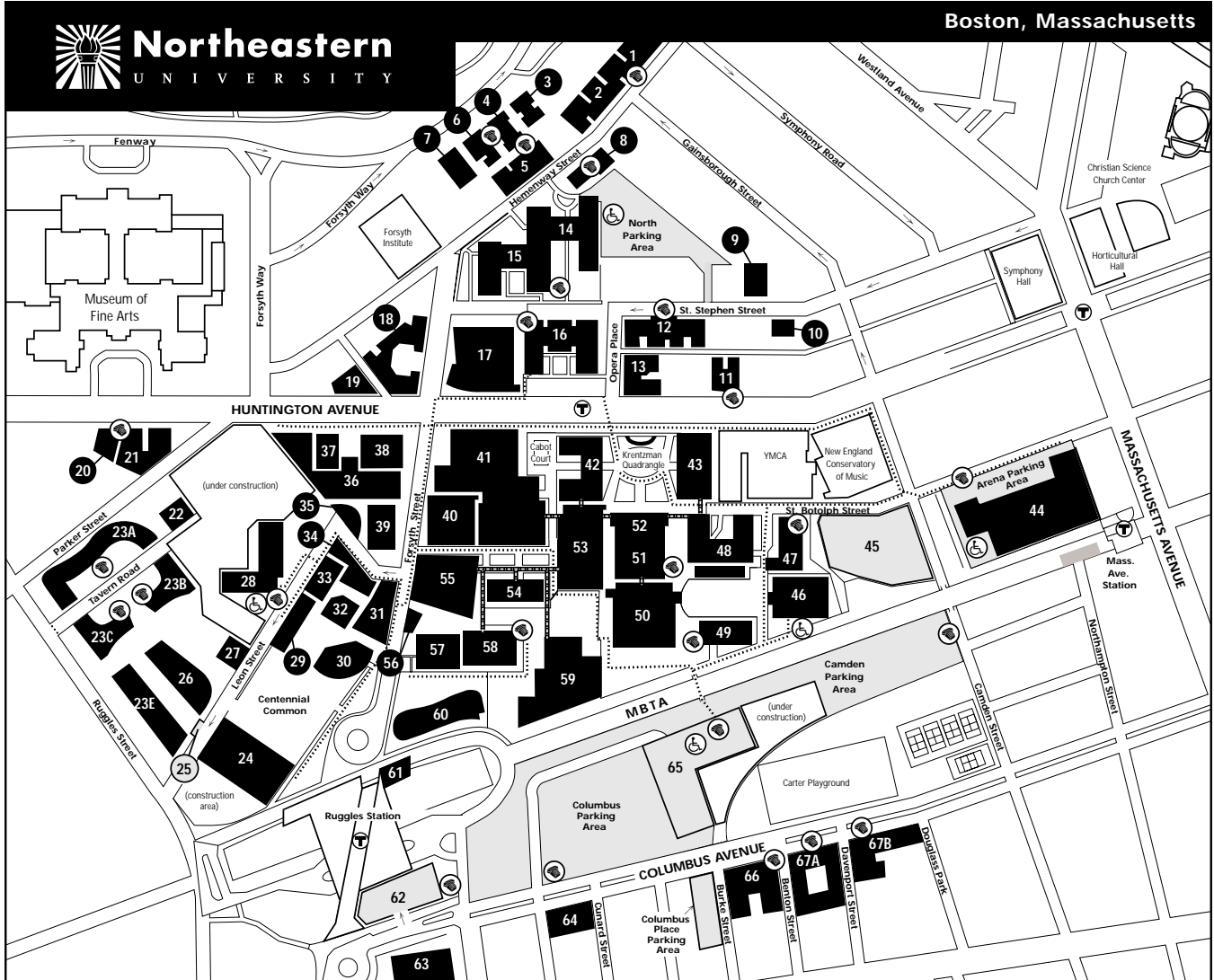
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. *Prereq. Permission of instructor.*

TOX U970 Junior/Senior Project 1
4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. *Prereq. Honors program participation.*

TOX U971 Junior/Senior Project 2
4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. Culminating experience in the University Honors Program. *Prereq. TOX U970 and honors program participation.*

Appendix

Campus Map



Academic and Service Buildings









61	Architecture Studio (RG)	46	Hurtig Hall (HT)
40	Barletta Natatorium (BN)	35	Kariotis Hall (KA)
26	Behrakis Health Sciences Center (BK)	4	Kerr Hall (Faculty Center) (KH)
51	Blackman Auditorium (AUDL)	38	Knowles Center (KN)
41	Cabot Physical Education Center (CB) TTY: Rm 110	34	Lake Hall (LA) TTY: Rm 203
7	Cahners Hall (CA) TTY: Rm 151	56	Latino/a Student Cultural Center (LC)
36	Cargill Hall (CG)	17	Marino Recreation Center (MC)
54	Churchill Hall (CH)	44	Matthews Arena (MA)
65	Columbus Parking Garage	29	Meserve Hall (ME) TTY: Rm 305
66	Columbus Place (CP) (716 Columbus Ave.)	48	Mugar Life Sciences Building (MU)
47	Cullinane Hall (CN)	31	Nightingale Hall (NI) TTY: Rm 125
50	Curry Student Center (Student Lounge) (CSC) TTY: Rm 255	27	O'Bryant African-American Institute (AF)
6	Cushing Hall (CU)	32	Power Plant
57	Dana Research Center (DA)	63	Renaissance Park (RN)
39	Dockser Hall (DK) TTY: Rm 107	62	Renaissance Park Garage
43	Dodge Hall (DG)	42	Richards Hall (RI) TTY: Rms 150, 254
60	Egan Engineering/Science Research Center (EC)	49	Robinson Hall (RB)
52	Eli Hall (EL) TTY: Rms 04, 104	24	Ryder Hall (RY) TTY: Rms 170, 180, 251, 270
55	Forsyth Building (FR) TTY: Rms 100, 135	30	Shillman Hall (SH)
45	Gainsborough Parking Garage	58	Snell Engineering Center (SN) TTY: Rm 120
53	Hayden Hall (HA) TTY: Rms 120, 202	59	Snell Library (SL) TTY: Reference Desk
10	Hillel-Frager (HF)	37	Stearns Center (ST) TTY: Rm 302
33	Holmes Hall (HO) TTY: Rm 276	25	West Village Parking Garage
		22	26 Tavern Road (TA)

Residence Buildings

21	Burstein Hall (BU)
67	Davenport Commons A, B (DC)
1	Kennedy Hall (KDY)
4	Kerr Hall (KH)
12	Levine Hall and St. Stephen St. Complex (LV)
9	Light Hall (LH)
5	Loftman Hall and 153 Hemenway St. (LF)
3	Melvin Hall (MH)
20	Rubenstein Hall (464)
2	Smith Hall (SM)
16	Speare Hall (SP)
14	Stetson East (SE) TTY: Public
15	Stetson West (SW)
23	West Village Residence Complex A, B, C, E (WV)
18	White Hall (WH)
28	Willis Hall (WI)
8	142–148 Hemenway Street (142–148)
11	319 Huntington Avenue (319)
13	337 Huntington Avenue (337)
19	407 Huntington Avenue (407)
64	780 Columbus Avenue (780)

Maps are provided by the Information Center, 115 Richards Hall, extension 2000 (TTY extension 3100). Some buildings on this map are used but not owned by Northeastern University. 7/02

Key

		
Academic, residential, and service buildings	Parking areas	Emergency telephone
		
Handicap parking	Street direction	TTY locations
		See alphabetic list of buildings for TTY locations.
Accessible routes	Underground tunnel	

Academic Calendar 2003–2004

2003

September	1	Monday	Labor Day. University closed.
	4	Thursday	Fall Commencement.
	8–9	Monday–Tuesday	Fall 2003 registration for all undergraduate full-time day students.
	10	Wednesday	Fall 2003 undergraduate full-time day classes begin.
October	13	Monday	Columbus Day. University closed.
November	11	Tuesday	Veteran's Day. University closed.
	27	Thursday	Thanksgiving Day. University closed.
	27–29	Thursday–Saturday	Thanksgiving recess. University closed except for key offices.
December	12	Friday	Last day of Fall 2003 undergraduate full-time day courses.
	15–19	Monday–Friday	Fall 2003 final examinations for undergraduate full-time day students.
	22–Jan. 2	Monday–Friday	Vacation.

2004

January	1	Thursday	New Year's Day. University closed.
	5–6	Monday–Tuesday	Spring 2004 registration for all undergraduate full-time day students.
	7	Wednesday	Spring 2004 undergraduate full-time day classes begin.
	19	Monday	Martin Luther King Jr.'s Birthday observed. University closed.
February	16	Monday	President's Day. University closed.
March	1–5	Monday–Friday	Spring Break.
April	14	Wednesday	Last day of Spring 2004 undergraduate full-time day courses.
	15	Thursday	Reading Day.
	16, 20–23	Friday, Tuesday–Friday	Spring 2004 final examinations for undergraduate full-time day students.
	19	Monday	Patriot's Day. University closed.
	26–30	Monday–Friday	Vacation.
May	1	Saturday	Commencement.
	3	Monday	Summer 1 2004 registration for all undergraduate full-time day students.
	4	Tuesday	Summer 1 2004 undergraduate full-time day classes begin.
	31	Monday	Memorial Day. University closed.

June	17	Thursday	Last day of Summer 1 2004 undergraduate full-time day classes.
	21–22	Monday–Tuesday	Summer 1 2004 final examinations for undergraduate full-time day students.
	23–25	Wednesday–Friday	Vacation.
	28	Monday	Summer 2 2004 registration for all undergraduate full-time students.
	29	Tuesday	Summer 2 2004 undergraduate full-time day classes begin.
July	5	Monday	Independence Day observed. University closed.
August	12	Thursday	Last day of Summer 2 2004 undergraduate full-time day classes.
	16–17	Monday–Tuesday	Summer 2 2004 final examinations for undergraduate full-time day students.
	18–Sept. 3	Wednesday–Friday	Vacation.
September	2	Thursday	Fall Commencement.
	6	Monday	Labor Day. University closed.

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- Pran Nath
Matthews Distinguished University Professor; Physics; Stanford University, PhD, 1964
- Stephen Nathanson
Professor; Philosophy and Religion; Johns Hopkins University, PhD, 1969
- Zainalebedin Navabi
Adjunct & Research Faculty, Electrical and Computer Engineering; University of Arizona, Tucson, PhD, 1981
- Hamid Nayeb-Hashemi
Professor; Mechanical, Industrial, and Manufacturing Engineering; Massachusetts Institute of Technology, PhD, 1982
- Carl W. Nelson
Associate Professor; General Management; University of Manchester (United Kingdom), PhD, 1970
- Donna Newby
Assistant Professor; Nursing; Boston College, PhD, 1993
- Judith A. Noblitt
Associate Professor; Physical Education and Dance; Springfield College, MEd, 1970
- Carey Noland
Assistant Professor; Communication Studies; Ohio University, PhD, 2000
- Ann C. Noonan
Associate Professor; Physical Therapy; Northeastern University, EdD, 1989
- Matthew P. Noonan
Academic Specialist, English; Massachusetts College of Art, MFA, 2000
- Dave N. Norris
Assistant Professor; Economics; University of Texas, Austin, PhD, 2000
- Guevara Noubir
Assistant Professor; Computer and Information Science; Swiss Federal Institute of Technology, Lausanne (Switzerland), PhD, 1996
- Carmen Martinez Novo
Assistant Professor; Sociology and Anthropology; New School for Social Research, PhD, 2000
- Vladimir Novotny
Camp, Dresser and McKee, Inc. Professor of Engineering, Civil and Environmental Engineering; Vanderbilt University, PhD, 1971
- Carla B. Oblas
Clinical Assistant Professor; Mathematical Practice; University of California, Davis, MS, 1972
- Richard L. O'Bryant
Assistant Professor; Political Science; Massachusetts Institute of Technology, PhD, 2003
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Assistant Cooperative Education Adviser; Cooperative Education; Lesley College, MS, 1997
- Suzanne P. Ogden
Professor; Political Science; Brown University, PhD, 1974
- Rei Okamoto
Assistant Professor; Modern Languages; Temple University, PhD, 1998
- Donald M. O'Malley
Assistant Professor; Biology; Harvard University, PhD, 1989
- Mary Jo Ondrechen
Professor; Chemistry and Chemical Biology; Northwestern University, PhD, 1978
- Therese M. O'Neil-Pirozzi
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- Kwamina Panford
Associate Professor; African-American Studies; Northeastern University, PhD, 1989
- Robert A. Parsons
Associate Professor; Management Science; Boston College, MA, 1967
- Mark E. Pasnik
Lecturer; Architecture; Harvard University, MArch, 1995
- Leslie J. Pasternack
Lecturer; Theatre; University of Texas, Austin, MA, 1993
- Rupal Patel
Assistant Professor; Speech Language Pathology and Audiology; University of Toronto (Canada), PhD, 2000
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Assistant Clinical Specialist, Physical Therapy; Massachusetts General Hospital Institute of Health Professions, MS, 1996
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- Anthony N. Penna
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- Eric B. Pepin
Associate Clinical Specialist, Cardiopulmonary and Exercise Sciences; University of Northern Colorado, EdD, 1993
- Judith Perrolle
Associate Professor, Sociology and Anthropology; Brown University, PhD, 1980
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Associate Professor, Biology; Massachusetts Institute of Technology, PhD, 1981
- Harlan D. Platt
Professor, Finance and Insurance; University of Michigan, PhD, 1976
- Marjorie Platt
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Professor, Political Science and Education; University of Wisconsin, Madison, PhD, 1988
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Assistant Cooperative Education Coordinator; Northeastern University, MSEE, 1968
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Professor, Biology; University of California, Berkeley, PhD, 1975
- Sheila Prasad-Hinchey
Professor, Electrical and Computer Engineering; Harvard University, PhD, 1959
- Jeremy Prestholdt
Assistant Professor, History; Northwestern University, PhD, 2003
- Emmett G. Price III
Assistant Professor, Music; University of Pittsburgh, PhD, 2000
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Professor, Computer and Information Science; Columbia University, PhD, 1977
- Sheila M. Puffer
Professor, General Management; University of California, Berkeley, PhD, 1985
- Donna M. Qualters
Associate Professor, Education; Lesley University, PhD, 1988
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Professor, Marketing; New York University, PhD, 1978
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- Rajmohan Rajaraman
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- Carey M. Rappaport
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- Richard A. Rasala
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Professor, Physics; University of Liverpool (United Kingdom), PhD, 1969
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Professor, Pharmacy; Duquesne University, PharmD, 1983
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- Jennifer B. Robinson
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- Nelson Rodriguez
Assistant Professor, Education; Pennsylvania State University, PhD, 2000
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- Andrew J. Rohm
Assistant Professor, Business Marketing; University of Massachusetts, PhD, 2001
- Bruce Ronkin
Professor, Music; University of Maryland, DMA, 1987
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- Peter S. Rosen
Associate Professor, Geology; College of William and Mary, PhD, 1976
- Rebeca B. Rosengaus
Assistant Professor, Biology; Boston University, PhD, 1992
- James Ross
Associate Professor, Journalism; American University, MA, 1982
- Martin E. Ross
Associate Professor, Geology; University of Idaho, PhD, 1978
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Associate Professor, Accounting; Pennsylvania State University, PhD, 1993
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George A. Snell Professor; Chemical Engineering; Massachusetts Institute of Technology, PhD, 1977
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Professor; Modern Languages; Harvard University, PhD, 1977
- J. Timothy Sage
Associate Professor; Physics; University of Illinois, Urbana-Champaign, PhD, 1986
- Jacqueline Salcedo
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- Masoud Salehi
Associate Professor; Electrical and Computer Engineering; Stanford University, PhD, 1979
- Eugene J. Saletan
Professor Emeritus; Physics; Princeton University, PhD, 1962
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Professor; General Management; University of Michigan, PhD, 1976
- Mehrdad Sasani-Kolori
Assistant Professor; Civil and Environmental Engineering; University of California, Berkeley, PhD, 2001
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Adjunct Professor; Chemical Engineering; Massachusetts Institute of Technology, ScD, 1980
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Associate Professor; Pharmacy and Toxicology; University of Rhode Island, PhD, 1971
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Associate Professor; Biology; Pennsylvania State University, PhD, 1974
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- David E. Schmitt
Edward Brooke Professor; Political Science; University of Texas, PhD, 1971
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- Alan Schroeder
Associate Professor; Journalism; Harvard University, MPA, 1989
- Egon Schulte
Professor; Mathematics; University of Dortmund (Germany), PhD, 1985
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Professor; Pharmacy; University of Southern California, PharmD, 1961, Wayne State University, PhD, 1972
- Martin Schwarz
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- Richard J. Scranton
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- Philip E. Serafim
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- Susan M. Setta
Associate Professor; Philosophy and Religion; Pennsylvania State University, PhD, 1979
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Lecturer; Architecture; Harvard University, MArch, 2001
- Bahram Shafai
Associate Professor; Electrical and Computer Engineering; George Washington University, ScD, 1984
- Jayant M. Shah
Professor; Mathematics; Massachusetts Institute of Technology, PhD, 1974
- Thomas M. Shapiro
Professor; Sociology and Anthropology; Washington University, PhD, 1978
- Nancy H. Sharby
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Assistant Professor; English; Rensselaer Polytechnic Institute, PhD, 1998
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- Claudia Sokol
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- Jeffrey B. Sokoloff
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- Marius M. Solomon
Professor; Management Science; University of Pennsylvania, PhD, 1984
- David D. Sonnenschein
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- Bert A. Spector
Associate Professor, Human Resources Management; University of Missouri, PhD, 1977
- John Spiegel
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- Francis C. Spital
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- Srinivas Sridhar
Distinguished Professor, Physics; California Institute of Technology, PhD, 1983
- Yogendra N. Srivastava
Professor, Physics; Indiana University, PhD, 1964
- Aleksandar M. Stankovic
Professor, Electrical and Computer Engineering; Massachusetts Institute of Technology, PhD, 1993
- Scott A. Stanley
Associate Clinical Specialist, Cardiopulmonary and Exercise Sciences; Northeastern University, MS, 1994
- Chad A. Starkey
Associate Professor, Athletic Training Education; Ohio University, PhD, 1988
- Thomas Starr
Associate Professor, Visual Arts; Yale University, MFA, 1994
- Maria K. Stein
Assistant Cooperative Education Coordinator; Northeastern University, MEd, 1987
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Assistant Professor, Education; University of Connecticut, PhD, 1998
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Professor, Biology; Rockefeller University, PhD, 1971
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Professor, Mathematics; Columbia University, PhD, 1984
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- Denis J. Sullivan
Professor, Political Science; University of Michigan, PhD, 1987
- Fareena Sultan
Associate Professor, Marketing; Columbia University, PhD, 1986
- Andrew M. Sum
Professor, Economics; Massachusetts Institute of Technology, MA, 1971
- Anna Suranyi
Assistant Professor, History; University of California, Los Angeles, PhD, 2001
- John D. Swain
Associate Professor, Physics; University of Toronto (Canada), PhD, 1990
- Marc L. Swatt
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- William Terrill
Assistant Professor, Criminal Justice; Rutgers University, PhD, 2000
- Eric J. Thorgerson
Visiting Professor, Chemical Engineering; University of South Carolina, PhD, 1969
- George H. Thrush
Associate Professor, Architecture; Harvard University, MArch, 1988
- Judith Tick
Professor, Music; City University of New York, PhD, 1979
- Robert R. Tillman
Associate Professor, Cooperative Education; Northeastern University, EdD, 1988
- William T. Tita
Lecturer, General Management; University of Pittsburgh, PhD, 1977
- Gordana G. Todorov
Associate Professor, Mathematics; Brandeis University, PhD, 1979
- Michael C. Tolley
Associate Professor, Political Science; Johns Hopkins University, PhD, 1990
- Vladimir P. Torchilin
Professor, Pharmaceutical Sciences; Moscow State University (Russia), PhD, DSc, 1981
- Ali Touran
Associate Professor, Civil Engineering; Stanford University, PhD, 1980
- Emery A. Trahan
Professor, Finance and Insurance; State University of New York, Albany, PhD, 1988
- Jennifer M. Trujillo
Associate Clinical Specialist, Pharmacy; University of Arizona, PharmD, 1997
- Geoffrey C. Trussell
Assistant Professor, Biology; College of William and Mary, PhD, 1998
- Bonnie TuSmith
Associate Professor, English; Washington State University, PhD, 1989
- Jenny A. Van Amburgh
Assistant Clinical Specialist, Pharmacy; Albany College of Pharmacy, PharmD, 1999
- Sean P. Varano
Assistant Professor, Criminal Justice; Michigan State University, PhD, 2002
- Gopala K. Vasudevan
Visiting Assistant Professor, Finance and Insurance; New York University, PhD, 1994
- Michael T. Vaughn
Professor, Physics; Purdue University, PhD, 1960
- Susan H. Ventura
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Professor, General Management; Boston University, PhD, 1980
- Carmine Vittoria
Professor, Electrical and Computer Engineering; Yale University, PhD, 1970

- Paul Vouros
Professor, Chemistry and Chemical Biology; Massachusetts Institute of Technology, PhD, 1965
- Sara Wadia-Fascetti
Associate Professor, Civil Engineering; Stanford University, PhD, 1994
- Susan Wall
Associate Professor, English; University of Pittsburgh, PhD, 1982
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Assistant Cooperative Education Coordinator; Tufts University, MSME, 1998
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Assistant Professor, Visual Arts; Harvard University, PhD, 1995
- James Y. Wang
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- Patrick S. P. Wang
Professor, Computer and Information Science; Oregon State University, PhD, 1978
- Geoff K. Ward
Assistant Professor, Criminal Justice; University of Michigan, PhD, 2001
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Matthews Distinguished University Professor, Biology; University of California, Los Angeles, PhD, 1971
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Special Assistant to the Director of Government Relations and Community Affairs, African-American Studies; Brandeis University, PhD, 1983
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Associate Professor, Economics; Rutgers University, PhD, 1978
- Barbara L. Waszczak
Associate Professor, Pharmacy; University of Michigan, PhD, 1978
- Andrew Watson
Assistant Professor, General Management; University of Massachusetts, PhD, 2001
- Mary E. Watson
Associate Professor, Cardiopulmonary Sciences; Boston University, EdD, 1983
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Professor, Accounting; University of California, Los Angeles, PhD, 1976
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Assistant Professor, Pharmacy; College of Advanced Technology, PhD, 1993
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Professor, English; New York University, PhD, 1964
- Jonathan B. Welch
Professor, Finance and Insurance; University of Connecticut, PhD, 1975
- Edward G. Wertheim
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- Alan West-Durán
Assistant Professor, Modern Languages; New York University, PhD, 1993
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Professor, Mathematics; Brandeis University, PhD, 1980
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Senior Academic Counselor, Criminal Justice; Fordham University, MSEd, 1997
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Assistant Professor, Nursing; Boston College, DNSc, 1990
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- Ronald J. Williams
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Clinical Placement Administrator, Nursing; Boston State College, BSN, RN, 1981
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- Mustafa R. Yilmaz
Professor, Management Science; Johns Hopkins University, PhD, 1974
- Mark L. Yorra
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- Robert F. Young
Associate Professor, Marketing; Harvard University, DBA, 1980
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NORTHEASTERN UNIVERSITY TITLE II REPORT CARD 2000–2001

Massachusetts Tests for Educator Licensure
Annual Institution Report

Program Year: 2000–2001

Institution: 39 — Northeastern University

Number of Program Completers: 49

Test Field/Category	Number Tested	Institution Number Passed	Pass Rate	Statewide Pass Rate
Basic Skills				
CommLit Reading	47	46	98%	96%
CommLit Writing	46	45	98%	94%
Aggregate	47	45	96%	93%
Academic Content Areas				
02 Early Childhood	4	–	–	91%
03 Elementary	16	16	100%	90%
05 Social Studies	2	–	–	87%
06 History	4	–	–	88%
07 English	6	–	–	89%
09 Mathematics	3	–	–	88%
11 Physics	1	–	–	80%
13 Biology	2	–	–	94%
Aggregate	38	38	100%	90%
Teaching Special Populations				
25 Moderate Disabilities	4	–	–	98%
Aggregate	4	–	–	97%
Summary Totals and Pass Rates	47	45	96%	87%

Contextual Information

S.1 Total number of students admitted into teacher preparation, all specializations, in academic year 2000–2001	165
S.2 Number of students in supervised student teaching in academic year 2000–2001	40
Number of faculty members who supervised student teachers:	
S.3A Full-time faculty in professional education	6
S.3B Part-time faculty in professional education but full time in the institution	3
S.3C Part-time in professional education, not otherwise employed by the institution	6
S.4 Total faculty student teaching supervisors	15
S.5 Student teacher/faculty ratio	2.7
S.6A The average number of student teaching hours per week required	40
S.6B The total number of weeks of supervised student teaching required	12
S.7 Average total number of hours required	480

