University *of* New Haven

2009-2011

GRADUATE CATALOG

University *of* New Haven

GRADUATE SCHOOL CATALOG

2009–2011

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UNIVERSITY OF
NEW HAVEN

This catalog supersedes all previous bulletins, catalogs, and brochures published by the University of New Haven Graduate School, and describes academic programs to be offered beginning in Fall 2009. Graduate students admitted to the University for the Fall of 2009 and thereafter are bound by the regulations published in this catalog.

The University of New Haven is committed to affirmative action and to a policy that provides for equal opportunity in employment, advancement, admission, educational opportunity, and administration of financial aid to all persons on the basis of individual merit. This policy is administered without regard to race, color, national or ethnic origin, age, gender, religion, sexual orientation, or disabilities not related to performance. It is the policy of the University of New Haven not to discriminate on the basis of gender in its admissions, educational programs, activities, or employment policies, as required by Title IX of the 1972 Educational Amendments. The University is authorized under federal law to enroll nonimmigrant alien students.

Inquiries regarding nondiscrimination, affirmative action, equal opportunity, and Title IX may be directed to the University's Equal Opportunity/Affirmative Action officer at 300 Boston Post Road, West Haven, CT 06516; phone 203.932.7265. Persons who have special needs requiring accommodation should notify the University's Disabilities Services and Resources Office at Voice/TDD number 203.932.7332.

Every effort has been made to ensure that the information contained in this publication is accurate and current as of the date of publication; however, the University cannot be held responsible for typographical errors or omissions that may have occurred. Changes made subsequent to the date of publication can be found on the University's website.

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The University reserves the right to make, at any time, whatever changes it deems necessary in admission requirements, fees, charges, tuition, policies, regulations, and academic programs prior to the start of any class, term, semester, trimester, or session. All such changes are effective at such times as the proper authorities determine and may apply not only to prospective students but also to those already enrolled in the University.

Dear Graduate Student:

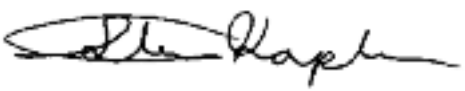
At the University of New Haven, we provide world-class career preparation in all of our programs, but our overarching goal is to prepare students to lead meaningful lives. As you examine this catalog and become aware of the breadth and diversity of our graduate programs, you will recognize the remarkable opportunity you are facing. You are about to embark on a journey in your chosen area of study that will help you grow personally and professionally. Our hope, and our mission, is that this journey will help you achieve a more meaningful career, the benefits of lifelong learning, and a sense of your responsibility as a citizen of the world.

The Graduate School at UNH was founded in 1969 and is one of the largest in Connecticut. Our advanced-degree alumni are employed in private industry and the public sector throughout the state, across the nation, and around the world. Our faculty hold doctoral or terminal degrees in their respective fields and, in many cases, bring with them national and international reputations in those fields. They also have professional, real-world experience that is especially vital to students' careers. They are committed in unrivaled ways to the success of each and every one of their students. A wide range of support services is also available to you at UNH, and we are constantly working to improve and enrich the educational experience of our graduate students.

One of my favorite quotations is from the late Ernest Boyer, a former president of the Carnegie Foundation, who once warned that the "crisis of our time relates not to technical competence, but to a loss of the social and historical perspective, to the disastrous divorce of competence from conscience." As you focus your studies in your chosen field, I hope you will also allow yourself some time to question your own values as well as prevailing societal values, and look for ways to improve the world that you will help to form as a member of a global society.

I wish you success in your studies and personal enrichment through your experiences at the University of New Haven.

Sincerely,



Steven H. Kaplan
President

Graduate School Programs

Master's Degree Programs

Business Administration, M.B.A.
Cellular and Molecular Biology, M.S.
Community Psychology, M.A.
Computer Science, M.S.
Criminal Justice, M.S.
Education, M.S.
  Teacher Certification
  Professional Education
Electrical Engineering, M.S.
Emerging Leaders, M.B.A.
Environmental Engineering, M.S.
Environmental Science, M.S.
Engineering Management, M.S.
Executive Program, M.B.A.
Fire Science, M.S.
Forensic Science, M.S.
Health Care Administration, M.S.
Human Nutrition, M.S.
Industrial Engineering, M.S.I.E.
  also M.B.A./M.S.I.E. dual degree
Industrial/Organizational Psychology, M.A.
Labor Relations, M.S.
Management of Sports Industries, M.S.
Mechanical Engineering, M.S.M.E.
National Security and Public Safety, M.S.
Public Administration, M.P.A.
  also M.B.A./M.P.A. dual degree
Taxation, M.S.

Graduate Certificates

Accounting
Applications of Psychology
Bioinformatics
Business Management
Civil Engineering Design
Computer Programming
Finance
Fire/Arson Investigation
Fire Science Technology
Forensic Psychology
Forensic Science/Forensic Computer Investigation
Forensic Science/Advanced Investigation
Forensic Science/Criminalistics
Forensic Science/Fire Science
Geographical Information Systems
Health Care Management
Human Resources Management
Information Protection and Security
International Business
International Relations
Lean/Six Sigma
Legal Studies
Logistics
Long-Term Health Care
Management of Sports Industries
Marketing
National Security
National Security Administration
National Security Technology
Psychology of Conflict Management
Public Administration
Public Management
Public Safety Management
Quality Engineering
Taxation
Telecommunication Management
Victim Advocacy and Service Management

GRADUATE ACADEMIC CALENDAR 2009–2010

Fall Term 2009 — **Wednesday, September 2–Wednesday, December 9**

Labor Day: no classes Monday, September 7

Last day to petition for January graduation: Thursday, October 15

Thanksgiving recess: no classes Monday, November 23–Saturday, November 28

Thirteenth class of Monday-only classes to be held on Wednesday, December 9

Winter Term 2010 — **Monday, January 4–Saturday, April 3**

Commencement: 2 p.m., Saturday, January 16

Martin Luther King Day: no classes, Monday, January 18

Last day to petition for May graduation: Monday, March 1

Thirteenth class of Monday-only classes to be held either Friday, April 2 or Saturday, April 3

Spring Term 2010 — **Monday, April 5–Saturday, July 3**

Commencement: 10 a.m., Sunday, May 16

Memorial Day: no classes, Monday, May 31

Last day to petition for awarding of degrees in August: Tuesday, June 15

Thirteenth class of Monday-only classes to be held either Friday, July 2 or Saturday, July3

Summer Term 2010 — **Tuesday, July 6–Wednesday, August 18**

Awarding of Degrees: Saturday, August 21

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THE UNIVERSITY

At the University of New Haven, we are wholly dedicated to the professional future of our students and caringly committed to their achievement. We provide the people, the programs, and the places that enable our students to prepare for personal success — in their careers and in life.

The University of New Haven is a private, independent, comprehensive University based in southern New England, specializing in high-quality educational opportunities and preparation of both traditional and returning students for successful careers and self-reliant, productive service in a global society.

The Graduate School focuses on addressing students' needs for efficient acquisition of career-oriented credentials for advancement in the workplace and on helping individuals adapt to changes in their-work environment through continuing education.

Our Mission

The University of New Haven is a student-focused comprehensive university with an emphasis on excellence in arts and sciences and professional preparation. Our mission is to prepare our students to lead purposeful and fulfilling lives in a global society through experiential, collaborative, and discovery-based learning.

Our Vision

Our vision is to be the institution of choice for students who seek the highest quality education for professionally oriented careers. We will be noted for our ability to combine professional education with liberal arts and sciences and with the development of high ethical and cultural standards among our graduates.

Our Guiding Principles

UNH is committed to educational innovation, to continuous improvement in career-focused and professional education, and to support for scholarship and professional development.

UNH takes pride in, and models itself by, the standard of best practices in its commitment to service, quality, integrity, and personal caring. All academic programs, as well as campus and student life, provide rich opportunities for leadership, personal growth, and participation in the aesthetics of life so that the University of New Haven will personify a successful commitment to diversity, equality, and "the pursuit of happiness."

Our goal is to distinguish ourselves by the measures of student admissions; retention; career development; collaboration with business, industry, and community; and the success of our graduates and their support as alumni.

Our Values

We emphasize these values as we strive for educational excellence:

- Belief in and practice of UNH's mission and vision
- Commitment to the success of our students through caring and responsive service
- Teamwork: helping each other to succeed
- Communication: trusting, open, honest, and straightforward
- Commitment to thoughtful action
- Thinking, articulating, doing, and evaluating
- Leading by example with continuous improvement
- Facing all issues and being accountable
- Respect for the individual, including his or her thoughtful input
- Recognizing success

The Graduate School

The graduate programs at the University of New Haven offer students the opportunity to enhance and deepen skills and knowledge for already chosen careers in highly technical and competitive fields. Alternately, other graduate students are preparing to enter new careers. Most UNH graduate programs offer as part of the curriculum multiple areas of specialization; flexibility in elective choices; opportunities for experiential education, including field work, internships, independent study, and research; and the possibility of cooperative education work experience.

The University's faculty is outstanding in its combination of highly qualified, full-time academics (nearly 85 percent of whom hold doctoral or terminal degrees in their fields from a broad spectrum of prestigious institutions) and part-time faculty members employed in area businesses and professions who bring, in addition to noteworthy academic qualifications, practical insight and experience to the classroom.

The Graduate School offers more than 25 master's degree programs plus more than 40 graduate certificates. Classes are offered at various locations in Connecticut.

The Main Campus in West Haven offers all academic programs. However, the M.B.A. for Emerging Leaders is also scheduled at off-campus locations. UNH's branch campus in New London specializes in accelerated graduate degree programs for busy adults. The programs are offered in a cohort style, meaning that the same group of students completes the entire program together. These programs include the M.A. in Industrial/Organizational Psychology, the Master of Public Administration, the M.S. in Professional Education, the M.S. in Engineering Management, and graduate certificates in Lean/Six Sigma and Human Resources Management. The M.B.A. for Emerging Leaders is scheduled at New London as well.

The M.S. in Education is offered at the Main Campus and at off-campus locations in New London and Newington. In addition to the graduate programs in Connecticut, the University is also authorized to offer the M.S. in National Security and Public Safety at Kirtland Air Force Base in Albuquerque, New Mexico.

Conventional Graduate School courses are offered on a 13-week trimester schedule, beginning in September, January, and April. A condensed summer term is also offered. Most courses are scheduled during the early evenings and on weekends to meet the needs of employed students.

Accreditation

Regional

The University of New Haven is a comprehensive, nonsectarian, independent institution of higher learning, chartered by the General Assembly of the State of Connecticut and accredited by the Board of Governors for Higher Education of the State of Connecticut. It is also accredited by the New England Association of Schools and Colleges, Inc. (NEASC), a nongovernmental, nationally recognized organization whose affiliated institutions include elementary schools through collegiate institutions offering post-graduate instruction.

NEASC accreditation of an institution indicates that it meets or exceeds criteria for the assessment of institutional quality periodically applied through a peer group review process. An accredited school or college is one that has available the necessary resources to achieve its stated mission through appropriate educational programs, is substantially doing so, and gives reasonable evidence that it will continue to do so in the foreseeable future.

NEASC accreditation applies to the institution as a whole. As such it provides assurance about the overall quality of opportunities available to students.

Engineering

The bachelor of science degree programs in chemical, civil, electrical, and mechanical engineering are fully accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET). The computer science bachelor's degree program is fully accredited by the Computing Accreditation Commission (CAC) of the Accreditation Board for Engineering and Technology (ABET).

California Programs

Authorization for UNH to operate in California is granted through the Bureau for Private Postsecondary and Vocational Education, which oversees and monitors the University's compliance with regulations set forth in the California Education Code, and is the student's primary advocate in matters of consumer protection. This authorization applies to the University's Master of Science program in National Security and Public Safety.

New Mexico Programs

Based upon the University of New Haven's full accreditation by the New England Association of Schools and Colleges, and the Connecticut Department of Higher Education, the New Mexico Commission on Higher Education has determined that the University of New Haven qualifies for exempt status.

College of Business

The College of Business is strongly committed to continuous improvement and other goals that are espoused by AACSB International—The Association to Advance Collegiate Schools of Business. In this context, it endeavors to follow the organization's guidelines with respect to faculty, curricula, learning goals, programmatic initiatives and other important components of the educational experience for future business leaders at all levels of instruction. The College is committed to adhering to these standards and to seeking and achieving AACSB accreditation for its programs in the coming years.

Other Memberships

The University holds memberships in the Council of Graduate Schools, the Accreditation Board for Engineering and Technology, the National Association of Schools of Public Affairs and Administration (NASPAA), the National Association of Boards of Examiners for Nursing Home Administration, the Association of American Colleges, the College Entrance Examination Board, and other regional and national professional organizations. The University's programs conform to the curricular guidelines or pre-licensure requirements of professional discipline-specific organizations including the Council on Applied Masters Programs in Psychology, the Academy of Criminal Justice Sciences, the National Council for Accreditation of Teacher Education, the Commission on Accreditation for Dietetics Education, the National Association of Boards of Examiners for Nursing Home Administrators, and others.

University College

The Main Campus in West Haven offers all academic programs. UNH's branch campus located in New London specializes in accelerated degree programs for busy adults. Most programs are offered in a cohort style, meaning the same group of students completes the entire program together. These programs include the M.B.A. for Emerging Leaders, the M.S. in Engineering Management, the Master of Public Administration, the M.A. in Industrial/Organizational Psychology, the M.S. in Professional Education, and the Graduate Certificate in National Security.

History

The University of New Haven was founded in 1920 as the New Haven YMCA Junior College, a division of Northeastern University. It became New Haven College in 1926 by an act of the Connecticut General Assembly. For nearly forty years, the College held classes in space rented from Yale University.

In September 1958, the College completed construction of a classroom building on Cold Spring Street, New Haven, for its daytime engineering programs. That same year, the College received authorization from the Connecticut legislature to offer the bachelor of science degree in the fields of business, accounting, management, and industrial engineering. Although the student body on the new Cold Spring Street campus numbered fewer than 200, the College's facilities were fast becoming overcrowded. To meet the needs of the College and the local community, the Board of Governors purchased, in 1960, three buildings and twenty-five acres of land in West Haven formerly belonging to the New Haven County Orphanage.

The combination of increased classroom space and four-year degree programs sparked a period of tremendous growth in enrollment and facilities. In 1961, the year after the College moved to West Haven, the graduating class numbered seventy-five. Forty-seven years later, the figure has climbed to 1,560 for all of 2008.

New Haven College received full accreditation for its baccalaureate programs from the New England Association of Schools and Colleges in 1966. In 1969, the College took a major step forward with the addition of the Graduate School. Initially offering programs in business administration and industrial engineering, the Graduate School expanded rapidly.

Today, twenty-eight master's programs, along with a wide variety of graduate certificates, offer the approximately 800 graduate students many choices for post-baccalaureate study.

In 1970, on the fiftieth anniversary of its founding, New Haven College became the University of New Haven, reflecting the increased scope and the diversity of academic programs offered. Today, the University offers a rich variety of undergraduate and graduate degree programs in five schools: the College of Arts and Sciences, the College of Business, the Tagliatela College of Engineering, the Henry C. Lee College of Criminal Justice and Forensic Sciences, and the Graduate School.

Undergraduate and graduate courses and programs are offered on the Main Campus in West Haven and at other off-campus and in-plant sites. Graduate courses in selected fields are offered at our Southeastern campus in New London and in Waterbury, Shelton, and Newington. The graduate program in national security is also offered at a satellite location in New Mexico.

The University's Academic Colleges

The University of New Haven has five academic colleges, each with its own faculty and set of graduate programs.

College of Arts and Sciences

The College of Arts and Sciences, offers master's degree programs in six fields: the master of science in cellular and molecular biology, education, environmental science, and human nutrition; and the master of arts in community psychology and industrial/organizational psychology. Within the field of education, two options are available: the master of science in teacher certification or in professional education. The human nutrition program is offered part time, one weekend per month, at the Main Campus. The environmental science program provides opportunities for field and laboratory experience along with classroom instruction; students in cellular and molecular biology train for specialized careers in the fields of biotechnology, basic science, and pharmacological research. Graduate certificates provide short, specific programs in several fields including geographical information systems (GIS), applications of psychology, and bioinformatics.

At the undergraduate level, the College of Arts and Sciences offers associate and bachelor's degree programs in a wide variety of fields, from art to dental hygiene, from music and sound recording to psychology. A combined five-year BS/MS program in environmental science is offered for students who meet certain qualifications. UNH undergraduates who want to pursue a teaching career also may be eligible for early admission to the UNH Education Department through the accelerated entry process, which allows qualified undergraduates to begin their education course work as undergraduates and enables them to earn a bachelor's degree, master's degree, and Connecticut teacher certification in five years. Detailed information can be found in the Undergraduate Catalog.

College of Business

The mission of the College of Business is to provide high-quality, career-oriented education to students with varied backgrounds and experiences. The College will seek to accomplish this through comprehensive teaching programs and by engaging in a variety of research and consulting activities involving both the development of knowledge and its communication to the academic, business, and government

sectors. It is the vision of the College to be the regional leader in providing career-oriented, contemporary business education.

As the business environment becomes more complex, the College of Business provides educational experiences that prepare students to face the challenges of a dynamic world and to meet their responsibilities within a global society. Career-oriented programs employ current knowledge and techniques presented in a manner appropriate to the diverse backgrounds and experiences of our graduate students.

Through the Graduate School, the College of Business offers an M.B.A. program with a variety of concentrations and master's degree programs in health care administration, labor relations, and management of sports industries. A master's in public administration (M.P.A.) as well as two dual degrees, M.B.A./M.P.A. and M.B.A./M.S. in industrial engineering, are also available. The College also offers an executive MBA program, which has been a highly respected educational resource for Connecticut business leaders for more than a quarter of a century. In addition, many graduate certificates are available for students who seek a short graduate curriculum concentrated in a specific business area.

At the undergraduate level, the College of Business offers associate and bachelor's degree programs in the departments of accounting, communication, economics and finance, hotel and restaurant management, marketing, management, and tourism and hospitality administration. Detailed information can be found in the Undergraduate Catalog.

Tagliatela College of Engineering

Few professions can match engineering for challenge and excitement, and the changing face of engineering will shape the world in the twenty-first century—a world of exotic materials, new sources of energy, staggering telecommunications and computing capabilities, cybernetic factories, and public works needed by society. The mission of the Tagliatela College of Engineering (TCoE) is to prepare individuals for professional practice in diverse engineering areas, computer science, and chemistry. In addition, TCoE prepares individuals for lifelong education in their professional careers and for such formal post-baccalaureate education as their inclination and professional growth require.

Master of science degree programs are offered through the Graduate School in computer science, electrical engineering, environmental engineering, engineering management, industrial engineering, and mechanical engineering. A dual degree program combines the M.B.A. with the M.S. in industrial engineering. Graduate certificates are offered in civil engineering design, computer programming, logistics, and quality engineering.

At the undergraduate level, TCoE offers degrees in chemistry, computer engineering, information technology, and general engineering along with its four EAC/ABET-accredited engineering degrees in chemical, civil, electrical, and mechanical engineering and its CAC/ABET-accredited degree in computer science. Detailed information can be found in the Undergraduate Catalog.

Henry C. Lee College of Criminal Justice and Forensic Sciences

Through the Graduate School, the Henry C. Lee College of Criminal Justice and Forensic Sciences offers career-oriented graduate degree programs in criminal justice, fire science, forensic science (including the criminalistics laboratory program), and national security and public safety. A wide range of graduate certificates is also available in the same fields as well as in forensic computer investigation and information protection and security, for students seeking shorter study in specific subcategories of these disciplines.

Broad professional education is provided, often integrating classroom learning with laboratory and field experience. The programs attract students of varied ages and levels of expertise, from persons new to the field to seasoned professionals seeking national and/or regional accreditation and licensure.

Safety and professional degree programs and certificates also are offered at the undergraduate level in the same fields, plus legal studies. Information on undergraduate programs appears in the Undergraduate Catalog.

University College

University College was created in 2007 to reflect UNH's continued dedication to meeting the educational needs of adult students and the region's corporate communities, and to partner with the University's local and regional community. Programs and courses are designed specifically with adult learners in mind, focusing on academic excellence, convenience, and flexibility. Degree programs, customized training, and certificate programs are the domain of the appropriate academic College within the University of New Haven, thereby ensuring the academic quality and integrity of the programs. The mission of University College is stated below.

Mission Statement

- Recognizing the distinctive needs of adult and non-traditional students, provide opportunities to earn a college degree, to continue lifelong learning, to seek professional development, and to study English as a Second Language.
- In partnership with the other University of New Haven Colleges, offer high-quality academic programs and services uniquely designed for adult learners.
- Provide the resources and support necessary for adult students to achieve individual academic success and to enhance the academic experience.
- Develop and maintain a supportive learning environment that is responsive to the unique challenges faced by adult learners and that enables them to achieve academic success.
- As a metropolitan University in the New Haven area, respond in innovative ways to meet the emerging educational and training needs of educators, businesses, public and social agencies, and our multi-faceted communities.
- Working with local communities, business, industry, and government, build partnerships to facilitate the development of educated and trained adults who are equipped to meet the needs and demands of current employment and new competition.

Center for Adult and Professional Studies

Undergraduate degree and certificate programs for adult and part-time learners are administered through the Center for Adult and Professional Studies (CAPS). Some programs can be completed exclusively in the evening while others may require day classes.

Additionally, CAPS is responsible for developing K–12 partnerships and programs, as well as community outreach programs, summer programs, and camps.

Graduate Admissions Office

The Graduate Admissions Office is responsible for centralized recruitment and admissions processing for more than 25 master's degree programs and more than 30 graduate certificate programs offered by the University.

Center for Graduate and Adult Student Services

The Center for Graduate and Adult Student Services provides support for graduate and adult students related to orientation, registration, financial aid, and student billing in cooperation with those specific offices and the Student Affairs Office. The Center for Graduate and Adult Student Services also works with graduate program coordinators and the Graduate Admissions and Financial Aid Offices to place students in graduate assistantship positions. The Center also assists graduate students seeking housing. A new adult student lounge is available on the second floor of Echlin Hall.

Southeastern Center

The Southeastern Center has been serving the educational needs of businesspeople and residents in Southeastern Connecticut and Rhode Island for nearly three decades.

Located on the campus of Mitchell College in New London, The Southeastern Center offers academic degree programs working adults who are interested in career advancement. Innovative programs allow students to complete their degrees quickly without sacrificing quality, and without getting in the way of work or personal pursuits.

Center for Corporate Education

The Center for Corporate Education provides customized corporate training programs to local and regional business and industry. Additionally, the Center administers the following cohort programs on the Main Campus and on the Southeastern campus located at Mitchell College in New London.

Graduate Degrees:

Executive MBA (EMBA)
MBA for Emerging Leaders
Master of Arts in Industrial/Organizational Psychology (MAI/OP)
Master of Public Administration (MPA)
Master of Science in Taxation
Master of Science in Labor Relations
Master of Science in Professional Education
Master of Science in Engineering Management (MSEM)

Graduate Certificates:

Human Resources Management
National Security
Health Care Management
Lean/Six Sigma

Non Credit Certificates:

Project Management
Business Essentials
Leadership
Undergraduate courses toward the Bachelor of Science in Mechanical Engineering

International Credential Assessment and Services

University College is responsible for coordinating the review of international course syllabi for the purpose of awarding University credit and the transcription of completed course work in conjunction with Cultural Experiences Abroad (CEA). A faculty committee has been established to review and assess course syllabi of international courses.

ELS Language Center

Intensive English programs are offered through the ELS Language Center on the Main Campus. The goal of the ELS Center is to prepare students to use language skills for professional endeavors and academic study in English-speaking environments. Completion of the appropriate programs will prepare students for undergraduate and graduate study. For further information contact ELS at 203.931.2970.

University College Contact Information

University College is located on the second floor of Echlin Hall. Hours are 8:30 a.m. to 7 p.m. Monday through Thursday; 8:30 a.m. to 4:30 p.m. on Friday; and 9 a.m. to noon on Saturday. You can reach us at 203.932.7180 or universitycollege@newhaven.edu.

The New Haven Area

The University of New Haven is located in south central Connecticut, between New York City and Boston. Situated on a West Haven hillside overlooking Long Island Sound, the campus is easily accessible by car (from Interstate 95), bus, train, and air.

New Haven, just ten minutes away from the campus, is a city where the arts and cultural activities flourish, as do science and business. Settled in 1638 and rich in history and heritage, New Haven is proud of its past, prouder of its present, and actively planning for its future. The city is a manufacturing center, a deep-water harbor, a major arts center, a college town with seven colleges and universities in the immediate area, and is known as the "Gateway to New England."

New Haven is home to the Shubert, Long Wharf, and Yale Repertory theaters; the New Haven Symphony Orchestra; and a number of museums, including the Peabody Museum of Natural History, the Eli Whitney Museum, the Yale Center for British Art, and the oldest university gallery in the western hemisphere, the Yale Art Gallery.

The Campus

The University's 80-acre campus contains 28 major buildings that house modern laboratory and research facilities, the latest computer equipment, athletic facilities, and residence halls.

The Main Campus includes Ellis C. Maxcy Hall (which houses administration, classrooms, Financial

Aid, College of Arts and Sciences, and College of Business); Bayer Hall (Undergraduate Admissions); Phillip Kaplan Hall; the Jacob F. Buckman Hall of Engineering (Tagliatela College of Engineering); Echlin Hall (which houses University College, Information Services, the Computer Science Department, the Fire Science Department, the Executive MBA office, and classroom spaces); the Marvin K. Peterson Library; Bartels Hall (the campus student center); the Psychology Building; Robert B. Dodds Hall (with classrooms, offices, labs, Dodds Theater, and the Seton Art Gallery); the Campus Store; residence halls; and the Gate House (Graduate Admissions), and the David A. Beckerman Recreation Center.

South Campus includes South Campus Hall (which houses the Graduate and Undergraduate Registrar's Office and is home to the Henry C. Lee College of Criminal Justice and Forensic Sciences). The University's athletic fields and Charger Gymnasium are located at North Campus.

The UNH Theater is in residence on campus and produces a variety of productions each year, including children's theater. The Seton Art Gallery features the work of renowned local and national artists, and devotes space to the University's Art Department.

Admission

General Requirements

Admission to the University of New Haven Graduate School requires that applicants hold a baccalaureate degree from a regionally accredited U.S. institution or from a foreign institution that is recognized by its jurisdictional Ministry of Education for granting baccalaureate degrees. Individual programs may have additional requirements for admission, details of which are included in the program listings in this catalog. For most programs, admission decisions are based primarily on an applicant's undergraduate record. A prospective student who is currently completing undergraduate study should submit an official transcript complete to the date of application. In such cases, an admission decision may be made on the basis of a partial transcript, contingent upon completion of the baccalaureate degree. Registration is not permitted until a final, official transcript is submitted to the Graduate Admissions Office. Students may submit scores from the Graduate Record Examination (GRE), GMAT, PRAXIS, or the Miller Analogies Test in support of their application. Students applying to certain programs are required to have test scores from such examinations sent directly from the testing service to the Graduate Admissions Office. Information regarding specific requirements for submission of test scores is contained in the program descriptions elsewhere in this catalog.

Procedure

Applicants for admission to the Graduate School must submit the University Graduate School Application, required letters of recommendation, official transcripts of all previous college work (sent directly from the colleges to the Graduate Admissions Office), the nonrefundable application fee, and test scores (if required). Application materials become the property of University of New Haven. An application form is located at the back of this catalog and online at www.newhaven.edu. In most cases, full-time and part-time domestic students may be admitted for any term, with the exception of a few selected degree programs. See individual programs for requirements.

Students (including international students required to maintain full-time enrollment based on immigration requirements) who are applying for full-time study may be notified that certain programs are limited to admission in the fall term only due to the planned sequence of courses. Should a student be unable to enter the Graduate School during the term for which admission is granted, acceptance will remain open for one calendar year. After one year, a new application for admission may be required. Students accepted into a program are subject to the specific program requirements and rules of the Graduate Catalog in effect for the term in which the student is enrolled in the first course in that degree program. However, if a student subsequently submits a program change request and is accepted into a

new or different program/degree, the student is subject to the rules of the Graduate Catalog in effect at the date/time of acceptance into the newly selected program.

Admission Categories

Admitted applicants and students in the Graduate School are assigned to one of four categories: fully accepted, provisionally accepted, special, (nonmatriculant), or auditor. Domestic students who wish to matriculate in a degree program, but who have not completed the application process and/or have not yet received a formal acceptance decision, may register as in-process students for one term while completing the application process.

A bachelor's degree is required for admission to all categories.

Fully Accepted

Students accepted without special stipulations for entrance into a regular degree program or certificate study are classified as fully accepted students.

Provisionally Accepted

Applicants may be accepted provisionally in the following situations: undergraduate grade point average falls below the standard set for full acceptance; acceptance requires additional test or document submission to support entrance into the program selected; or their undergraduate background indicates a need for additional course work or a short period of academic supervision and review. Students accepted provisionally should seek advice from the appropriate coordinator or advisor during the provisional period. Students must complete the stipulated requirements of provisional acceptance at the beginning of the program of study. Upon completion of these requirements, each student's record is evaluated for admission as a fully matriculated candidate for the degree.

Special (Nonmatriculated)

Special status is reserved for students who do not wish to matriculate in a degree program or certificate study. Registration in this category is normally limited to no more than 12 credits of graduate work. Students who wish to continue graduate work must be accepted into a specific graduate program. Special students are responsible for meeting prerequisite requirements for the courses they wish to take.

Auditor

An auditor is allowed to attend class and is expected to participate in class discussions and complete the required assignments. An auditor receives no grade or credit toward any degree and pays a lower tuition rate than a student who takes a class for academic credit. While auditor status does not imply admission to any graduate degree program, there is an official registration procedure, and a notation of audit is placed on the transcript. Both current students and new students are eligible to audit Graduate School courses.

Auditing provides a low-cost method of upgrading information and skills plus broadening educational perspective. Therefore, the courses available to auditors are limited to those at or below the level of the UNH degree obtained by the student on a space-permitting basis. Once the course has begun meeting auditors cannot change their status from audit to credit.

Admission of International Students

University of New Haven graduate programs are open to qualified international students. To qualify, a prospective student must have completed sufficient undergraduate preparation in a degree program acceptable to the Graduate School. The Graduate School operates on a trimester system. The fall term begins in early September, the winter term begins in early January, and the spring term begins in early April.

Because the review of international applications takes considerable time, it is important that the application and supporting materials be received by the Graduate Admissions Office prior to the deadlines outlined in the international student information packet.

U.S. Immigration regulations require that a person holding student status make satisfactory progress

toward a degree. This requires full-time study, which is generally interpreted to mean completing at least three courses (9 credits) each trimester. Prospective international students should note that graduate certificates, the Executive MBA, the mechanical engineering master's program, and the human nutrition master's program are not designed to permit full-time study. Also, the programs in the Education Department do not accept international student applications.

To apply for admission to the Graduate School and to be ready to begin study, prospective international students must complete the steps outlined in the following section.

International Application Process

Applicants must submit the following materials:

1. A completed application form and the appropriate application fee.
2. Two letters of recommendation.
3. Official transcripts of all undergraduate and graduate work completed. Applicants may be asked to provide substantiation of courses taken, grades received, and/or the academic reputation of the undergraduate school within the educational system of the country in which the school is located. A certified English translation must accompany non-English transcripts.
4. Proof of English proficiency. This must consist of one of the following:
   a. The Test of English as a Foreign Language (TOEFL) examination with a minimum score of 70 on the Internet-based test (IBT). The official score report must be sent directly from the testing service/site to the Graduate Admissions Office. The International English Language Testing System (IELTS) with a minimum score of 6.0 is also acceptable. IELTS is jointly managed by the British Council, IDP:IELTS Australia, and the University of Cambridge ESOL Examinations.

      Students whose TOEFL score is less than 70 IBT or whose IELTS score is less than 6.0 are required to take and pass E 600 English Language Workshop in the first term of enrollment at the Graduate School.

   b. Proof of completion of Level 112 in an ELS Language Center program (visit www.els.edu for information).
   c. Proof of completion of the Advanced Level from any of the USA-based Kaplan English Programs (www.kaplanenglish.com).
   d. Proof that undergraduate academic instruction and courses were completed using the English language.
5. Financial documentation. International students must provide verification of sufficient funds for study and living expenses for 12 months. This verification must be one of the following:
   a. Completed UNH Financial Statement of International Students and bank statement.
   b. Current official scholarship letter.

      The University of New Haven does not offer need-based financial assistance to international students.
6. Acceptance fee of $200. This nonrefundable fee must be paid before immigration documents (Form I-20 for students entering the United States on F-1 visas or DS-2019 for J-1 students) are issued. This fee is not credited toward tuition and is not required in advance from scholarship students.
7. Medical forms. Entering students must comply with health requirements by submitting the following forms required by the UNH Health Services Office:
   a. Measles/Rubella Immunization Form (required of all students)
   b. Health Examination Report (required of full-time students).

Visa documents (Form I-20 or Form DS-2019) are issued only after a student has submitted all required materials, has been accepted in a program of study, has provided acceptable proof of English proficiency and financial status, and has paid the $200 acceptance fee.

Initial Attendance at the University

At the time of registration, students are required to pay a tuition deposit of $40 per course. This

deposit is applied to the cost of tuition. The deposit is non-refundable but can be transferred to another class as long as the initial number of credits does not decrease. The tuition and fees for a given term are due to be paid in full by the end of the first week of graduate classes in that particular term. Students whose tuition is supported by their employer must submit the following items to the Bursar's Office, in lieu of payment, by the stated due date: a copy of the employer's tuition reimbursement policy and a completed promissory note for corporate reimbursement.

International students accepted into the Graduate School must report to the International Services Office before registering for graduate classes.

International students are required to subscribe to the University's international student health insurance. A minimum premium of $700 per year will be charged to each student. Requests for information regarding coverage and/or premiums for dependents should be directed to the Health Services Office.

All students entering the University must comply with state laws regarding immunizations for measles and rubella. Applicants to the Graduate School must complete the Measles/Rubella Immunization Form and return it to the UNH Health Services Office. In addition, students enrolling at UNH for full-time study must also file a completed Health Examination Report with the Health Services Office. Medical forms and information can be obtained by contacting the Health Services Office at 203.932.7079 or 1.800.DIAL.UNH, Ext. 7079. It is the policy of the University, in cases of noncompliance, to withhold registration at the beginning of each term.

Registration

Registration, including drops and adds, is done online, using the University website. Registration open periods and deadlines are listed on the website. Returning students and new domestic students who have been admitted to programs will receive email notification about registration, and they can register online.

Domestic students who have not completed the application process or have not yet received a formal acceptance decision may register as in-process students for most programs. International students may not register as in-process students. Proof that the in-process student has an undergraduate degree is required at the time of registration and, when possible, transcripts of previous course work should be provided to facilitate advisement. In-process status remains in effect for one term. In-process students may register for no more than six credits without the approval of the director of Graduate Admissions or the coordinator of the program for which they are applying.

It is the responsibility of in-process students to ensure that all materials in support of their applications are received by the Graduate Admissions Office in time for an acceptance decision before the next term. In-process students may not register for a second term until an acceptance decision has been made. Permission to register as an in-process student does not guarantee admission to the Graduate School.

Students who fail to register for three consecutive terms will no longer receive email registration notification. It is the responsibility of such students to notify the Graduate Records Office of their desire to continue graduate study. Files for students who revert to an inactive status are retained for two years. At the end of that period, only a permanent record of credits earned is maintained.

Students may not add a course after the first class meeting without formal permission of the instructor.

A student may not withdraw from a course after the seventh scheduled class meeting.

The University reserves the right to change class schedules or instructors at any time. It further reserves the right to cancel any course and, in such cases, will refund course tuition to the students enrolled.

Students with an outstanding balance may not register or receive University services including academic transcripts. Students who register after the registration deadline are assessed a late fee.

ACADEMIC POLICIES

Academic Integrity

The University of New Haven is an academic community based on the principles of honesty, trust, fairness, respect, and responsibility. Academic integrity is a core University value that ensures respect for the academic reputation of the University, its students, its faculty and staff, and the academic credentials it confers. The University expects that students will learn in an environment where they work independently in the pursuit of knowledge, conduct themselves in an honest and ethical manner, and respect the intellectual work of others. Each member of the University community has a responsibility to be familiar with the definitions contained in, and to adhere to, the Academic Integrity Policy, which is found at
http://www.newhaven.edu/unh/marketing/pdfs/handbook/handbook.pdf

Violations of the Academic Integrity Policy include, but are not limited to, the following examples: cheating, collaboration/collusion, plagiarism, fabrication, and facilitating academic dishonesty. This Policy provides details concerning proscribed behavior as well as the procedures that are triggered in the event of infractions.

Academic Records

For each student enrolled in the Graduate School, academic records are maintained and housed in the Graduate Records Office. Records include the application for admission and supporting documents such as test scores, transcripts of undergraduate and other prior study, letters of recommendation, course schedules, petitions filed by the student, and any other documents or correspondence pertaining to the student's academic work. The Registrar is responsible for controlling access to and disclosure of students' educational records. Students desiring to inspect or review their records should address a written, dated request to the Registrar/Graduate Records. Information regarding confidentiality, privacy, and right of access to student records can be obtained from the Registrar.

Attendance

It is the responsibility of the student to attend all classes and to take examinations as scheduled. In the case of religious observance, students seeking an accommodation should consult with their instructor; faculty members receive periodic notices regarding religious holiday observances throughout the academic year.

Faculty have the right to require a standard of attendance, even if it conflicts with professional and job-related responsibilities of students. Students whose jobs require that they be absent from class must realize that it is their responsibility to determine whether such absence is permitted by the instructor, and to meet the requirements for making up missed classes if the instructor allows such time to be made up.

Make-Up Policy

Make-up examinations are a privilege extended to students at the discretion of the instructor, who may grant permission for make-up examinations to those students who miss an exam as a result of a medical problem, personal emergency, or previously announced absence. On the other hand, instructors may choose to adopt a "no make-up" policy. Students should refer to the instructor's make-up policy in the course syllabus and if no mention is made therein, should inquire directly. A make-up test fee may be assessed when a student is permitted to make up an announced test during the term or to take an end-of term exam at a time other than the scheduled time. In either case, the make-up examination fee will be paid by the student at the Bursar's Office.

Academic Standards

Course Grading System

The Graduate School uses the following grading system:

Superior performance:

A+ 4.00 quality points
A 4.00 quality points
A- 3.70 quality points

Good performance:

B+ 3.30 quality points
B 3.00 quality points
B- 2.70 quality points

Passing performance:

C+ 2.30 quality points
C 2.00 quality points
C- 1.70 quality points

Failure:

F Zero quality points

Withdrawal from a course:

W Zero quality points

Incomplete:

(See information on next page regarding incomplete courses.)
INC Zero quality points

Thesis students who did not complete work during the term in which they originally registered:

T Zero quality points
(Students must complete the work within the time limit for completion of the degree.)

Audit (indicates that a student registered for and attended a class for no credit):

AU Zero quality points

Pass/Fail courses:

Pass: Carries credits toward the degree. Use is limited to thesis and Executive M.B.A. courses.
P Zero quality points

Pass with distinction: Carries credits toward the degree. Use is limited to Executive M.B.A. courses.
P+ Zero quality points

Failure:

F Zero quality points

Non-credit courses:

Satisfactory performance in a non-credit course:
S Zero quality points

Unsatisfactory performance in a non-credit course:
U Zero quality points

Any grade change from one letter to another must be in accordance with procedures adopted by the Faculty Senate.

Student Access to Final Grades

Final grades in each subject are available online soon after the close of each term, provided that financial obligations have been met and no other holds are in place.

Incomplete Course Work

A grade of Incomplete (INC) is given only in special circumstances, and indicates that the student has been given permission by the instructor to complete the course (with the same instructor) after the end of the trimester or term. If a student is required to attend class sessions for the course in a subsequent term, tuition must be paid for this second attendance.

Master's-level students who receive a grade of INC should complete the work within three months after the end of the term. However, in extenuating circumstances, master's-level students may have a longer time period specified by the instructor (not to exceed one year) to complete the course and have a grade submitted to the Registrar/Graduate Records.

Any exception to the one-year time limit must be in accordance with procedures adopted by the Faculty Senate.

Quality Point Ratio

The academic standing of each student is determined on the basis of the quality point ratio (QPR) earned each term. Each letter grade is assigned a quality point value, as described in the section "Course Grading System."

To obtain the QPR, multiply the quality point value of each grade by the number of credits assigned to each course; then divide the sum of the quality points earned by the number of credits attempted (in courses for which a grade of A+ through C- or F is awarded). A cumulative QPR is obtained by calculating the QPR for all courses taken at the University of New Haven.

Academic Probation

Satisfactory progress is defined as a cumulative QPR of 3.0 or greater. Any student whose cumulative QPR is below 3.0 is placed on academic probation and is required to obtain written permission from the program coordinator to register for additional courses. This facilitates focused academic advisement and formulation of a suitable plan for the student. The program coordinator or designee may provide written conditions, beyond specifying the current term course registration, which would be included in the student's academic record.

Dismissal

A student whose cumulative QPR is below 2.7 after completion of at least 15 credits is dismissed from the Graduate School.

A student who has been dismissed may submit an appeal to the Associate Provost for Graduate Studies. If the appeal is granted, written conditions for the student must accompany permission to continue in the Graduate School. These conditions would be included in the student's academic record.

Repetition of Work

A student may repeat a course. The grade received in the subsequent attempt supersedes the original grade in the computation of the QPR if the new grade is higher. Both grades remain on the transcript. The course may be used only once for credit toward the requirements for the degree program.

Awarding of Degrees

The University awards degrees three times a year, in January, May and August. Commencement ceremonies are held in January and in May. A cumulative quality point ratio of 3.00 and completion of all program and University requirements are required for graduation and the conferring of master's degrees. Students must file a graduation petition in order to have their names placed on the list of potential graduates.

Petition for Graduation

Candidates for January commencement must file a graduation petition with the Graduate Records Office no later than October 15. Candidates for May commencement must file no later than March 1.

Candidates whose degrees will be awarded in August must file no later than June 15. Students completing the 5-year B.S./M.S. program in environmental science, the M.B.A./M.P.A. dual-degree program, or the M.B.A./M.S.I.E. dual-degree program must file two graduation petitions (one for each degree). Graduation petition forms are available (and may be submitted) online on the University website. A candidate who does not complete the requirements for graduation before the deadline, after having filed the petition to graduate, must petition again at a later date and pay a re-filing fee. All financial obligations to the University must be met prior to graduation.

Time Limit for Completion of Degree

A student must complete the requirements for the master's degree or certificate within five years of the date of completion of the first course following formal application to the degree program. Any extension of the time limit for completion of the degree can be granted only after approval by the appropriate program coordinator and the Associate Provost for Graduate Studies.

Students who reach the five-year limit with fewer than 24 graduate credits completed at UNH must apply for readmission to their program, rather than for an extension. Students readmitted to a graduate program begin the five-year time limit again and are subject to the rules of the Graduate Catalog in effect at the date/time of readmission.

Residency Requirements for Master's Degrees

Master's degree programs have a 30-credit residency requirement, with the exception of the M.B.A./M.S.I.E. and M.B.A./M.P.A. dual degree programs, which have a 60-credit residency requirement. Credits toward the residency requirement may be earned at the Main Campus, at the off-campus locations, or through UNH distance learning courses. Credits applied toward the requirement for one graduate degree may not be counted toward the residency requirement for another degree. In other words, an additional 30-credit residency requirement applies for those students who plan to complete a second master's degree program. The University policies for transfer of credit and waiver of courses apply in the same manner to candidates for a second master's degree as to those enrolling in their first master's program.

Full-Time Study

A full-time course of study at the graduate level is defined as enrollment for nine credits in the current term. Required courses, such as E 600, count toward full-time study. Full-time graduate students are required to pay the University health service fee each year.

A student who wishes to enroll for more than 12 graduate credits/four courses in a given trimester must secure the permission of the program coordinator.

Part-Time Study

Part-time study at the master's level is defined as registration for fewer than nine credits in the current term. Half-time study at the master's level is defined as registration for a minimum of five credits in the current term. Registration for fewer than five credits qualifies as less than half-time study. Certificate programs may have limited scheduled course offerings and, therefore, are generally pursued on a part-time basis. International students with F-1 or J-1 immigration status may not enroll for programs that are offered only on a part-time basis.

Transfer Credit

A graduate course is acceptable for transfer to UNH if the following conditions are met:

- The course is from a regionally accredited U.S. institution or from a foreign post-baccalaureate institution recognized by its local Ministry of Education as a degree-granting institution.
- The student received a grade of B- (2.7 on a 4-point scale) or better (or a Pass in a Pass/Fail course, provided the institution documents that a Pass is equivalent to a B- or better).
- The course has not been used previously to contribute to another credential.

The maximum number of credits a student may transfer is determined by the number of credits required by his or her program minus the 30-credit residency requirement. In all cases, an official transcript must be received directly from the institution where the course was taken and placed on file at UNH before transfer credit is awarded. Transfer credits are not included in courses used to establish a student's GPR or residency requirement at the University of New Haven.

The equivalency of a transferred course to a UNH course is approved by the Registrar and by the chair of the department offering the equivalent course at UNH. The Registrar maintains an updated listing of courses from other institutions for which transfer credit has been approved in the past. For matriculated students, the department chair's approval is required in order to assure that the transfer contributes properly to the student's degree progress. Courses in disciplines for which UNH has no equivalent may be approved for transfer as elective credits in the student's program. The Registrar and the student's major department chair approve these transfers.

Graduate students currently matriculated at the University must secure written approval before taking courses at another institution if they wish to transfer credits into their UNH program. Authorization for transfer of courses must be obtained from the department(s) housing the student's major and the related course at UNH. The Course Transfer Authorization form must be obtained online, approved by the department(s), and returned to the Registrar's office before the course begins.

Waiver of Courses

Some programs permit waivers of core courses on the basis of undergraduate or graduate courses taken at accredited U.S. institutions or recognized foreign institutions. Waivers of elective courses or concentration courses are not permitted, nor are waivers based on life experience. For a course to be waived, a student must secure the written approval of the program coordinator, the department chair, or the chair's designee in the department in which the waiver is requested. Even if a waiver has been granted, a student who wishes to take a waived course for review or as a refresher course may do so. However, tuition refunds are not granted for courses taken and subsequently waived.

Crediting Examinations

Under certain circumstances, students who have knowledge applicable to a specific course may apply for permission to take a crediting examination in lieu of taking the course. To qualify for a crediting examination, the student must have taken a similar course at either the graduate or undergraduate level; completed the equivalent work in non-credit training courses; or had extensive, related, on-the-job experience. Crediting examinations are subject to the following conditions:

- If the student passes the examination, a grade of P is awarded.
- The crediting examination is for required courses only (not for concentration courses or electives).
- The credits awarded by examination do not count toward the residency requirement.
- The crediting examination cannot be taken in the student's last trimester of study.

Permission to take a crediting examination must be granted by the department chair or program coordinator of the student's major, the chair of the department in which the course is offered, and the Associate Provost for Graduate Studies. Crediting examination permission forms are available online for printing and must be submitted to the Graduate Records Office. Once permission is granted and the crediting examination fee is paid, the examination is administered and graded by a full-time faculty member designated by the chair of the department that offers the course.

Prerequisites

Students are expected to meet the prerequisite requirements for each course taken. Exceptions must be approved by the course instructor and the student's advisor or program coordinator. Credit may be denied to a student who takes a course without having taken the prerequisites.

Dropping/Adding a Course

A student who wishes to drop or add a course during the approved period for such activity may do so online. Formal permission of the instructor is required to add a class after the first class meeting. If a student withdraws from a class after the first class meeting, the tuition refund policy is applied.

Comprehensive Examinations

Students who wish to schedule a comprehensive examination in order to complete their degree program must complete the appropriate comprehensive examination approval form, which is available online, and submit it to the Graduate Records Office after securing the necessary approvals and paying any required fees. Students should confirm arrangements for comprehensive examinations with the program coordinator.

Research Projects, Independent Study, and Internships

All academic programs leading to a master's degree require the completion of a capstone work — a thesis, a substantial research or other project, or a comprehensive examination. Students must have the written approval of the advisor, department chair, and program coordinator prior to enrolling for the capstone program research or project. Approval forms are available from the University website and at Graduate Records. In some programs, the capstone research or special project is structured as an internship or independent study, the approval for which is covered by the aforementioned process. However, some programs permit or encourage internships or independent studies under the supervision of a faculty advisor as distinct from the capstone requirement. Written approval for these is also required, using forms available from the website. A student may not register for more than six credits of independent study/internship within a degree program. An independent study/internship proposal must be approved by the student's advisor and/or program coordinator as well as the coordinator or chair of the department offering the course.

Students preparing a report for research, special project, internship, or independent study may be asked to follow the guidelines presented in the UNH Dissertation and Thesis Manual (2nd edition, 1998), copies of which are available on the University website, and in the Bookstore.

Thesis

Completion of a thesis is optional for master's degree programs. A number of preliminary steps are required before registration for the thesis is accepted by the Registrar. The student completes the Proposal for Thesis form (available online or at the Graduate Records Office), in which the proposed subject, hypothesis, and methodology are described. The student secures the approval signature of a faculty member who will serve as the thesis advisor. The student must also secure approval of the proposed thesis and thesis advisor from the department chair and/or program coordinator and the Associate Provost for Graduate Studies. Only after the Registrar has received the approved form is the student permitted to register for the thesis. A thesis will carry no fewer than six academic credits taken over no fewer than two academic terms. A preliminary draft must be presented to the advisor at least 75 days prior to commencement. Upon approval by the advisor and the program coordinator, unbound copies are presented to the Associate Provost for Graduate Studies. A date and time are then scheduled by the thesis advisor for the thesis defense before the student's thesis committee and the Associate Provost for Graduate Studies or a designee. Successful defense of the thesis must be completed at least three weeks prior to the date of commencement. Students must complete and defend the thesis within the time limit for completion of the degree.

After successful defense of the thesis and approval by the Associate Provost for Graduate Studies, thesis credit is awarded, and final, unbound copies are deposited with the Associate Provost for Graduate Studies to be forwarded for binding at the University library, where the thesis becomes a part of the permanent collection. Additional copies may be required by the department or the program coordinator.

For guidance in the preparation of theses, graduate students should consult the University's Dissertation and Thesis Manual (2nd edition, 1998), copies of which are available on the University website and in the Bookstore. Questions not resolved by the instructions should be resolved in consultation with the advisor and by reference to a standard style manual.

Graduate Certificates

The Graduate School offers a number of graduate certificates designed as options for those having a baccalaureate degree, or a master's degree, who want to enroll in a part-time, short, coherent course of study at the graduate level. Those who may not be ready to commit to a full-length graduate program, as well as those who already hold a graduate degree but want to pursue additional work in the same or another field, may find that a certificate provides the perfect alternative.

Students applying to Graduate School certificate program must complete the Graduate School application form, submit official transcripts showing completion of undergraduate/baccalaureate degree, and also submit two letters of recommendation. Inasmuch as the certificates are not graduate degrees, students may transfer credits earned toward a certificate into a master's program at any time, subject to the requirements of the master's degree, the decision of the program coordinator, and acceptance into the master's program. Although students who complete the requirements for a graduate certificate do not attend commencement, a certificate is awarded by the University to each student who qualifies.

Upon completion of the course requirements, a petition requesting issuance of the certificate must be executed. The form is available online and can be submitted online along with the required fee.

Students enrolled in master's degree programs who meet the qualifications for the awarding of a certificate during pursuit of the master's degree, but prior to petitioning for graduation, may submit a petition for certification. The course work is reviewed by the certificate advisor and the graduate Registrar. If the work is found to be complete and satisfactory, the certificate will be mailed to the student. A minimum QPR of 3.0 is required as satisfactory performance in courses taken at the University to qualify for the awarding of a graduate certificate.

Certificate Requirements

Required course work usually consists of 12 to 20 credits of graduate study, depending on the subject area selected. Students should contact the faculty advisor for assistance in planning the course of study for the selected certificate. A student may seek approval from the academic advisor for one course of transfer credit from another institution or program to be used to satisfy the requirements of the certificate. Course substitutions may be granted by the certificate advisor. Course credits used to satisfy the requirements for one certificate may not be used toward the completion of a second certificate. Students must meet course prerequisite requirements. Credits for courses taken as prerequisites for certificate courses must be taken in addition to the certificate requirements.

Academic Advising

It is the student's responsibility to select courses in accordance with prerequisites, advisor recommendations, the departmental plan of study (if required), and requirements for the degree. Students needing further explanation of program requirements or course sequencing should request academic advisement. Appointments for academic counseling are scheduled through concentration advisors or program coordinators. Advisement sessions are held prior to each trimester. It is the student's responsibility to meet the stated requirements for the degree. However, a student is not required to file a formal plan of study with the Graduate School.

Grievance Procedure

A formal policy for handling student grievances appears in the Student Handbook, which is available on the University website.

Notification of Family Educational Rights and Privacy Act (FERPA)

The Family Education Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records, as follows:

1. **The right to inspect and review the student's education records within 45 days of the day the University receives a request for access.** Students should submit to the Registrar, dean, head of academic department, or other 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 are 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 hearing procedures will be provided to the student when he or she is notified of the right to a hearing.
3. **The right to file a complaint with the U.S. Department of Education concerning alleged failures by the University of New Haven to comply with the requirements of FERPA.** The name and address of the office that administers FERPA are as follows: Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue S.W., Washington, DC 20202-4605.

Independent of the FERPA requirement, University policy relating to privacy of student academic and disciplinary records is as follows: Faculty and/or staff disclosure to others (including parents or guardians) of student academic information or disciplinary action requires a release from the affected student. Such a release should be obtained using a standard UNH form, which will be filed with the student's academic record (Registrar) or/and with the office of the Dean of Students.

4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the University of New Haven to comply with the requirements of FERPA. The name and address of the office that administers FERPA are as follows: Family Policy Compliance Office, U.S. Department of Education, 600 Independence Avenue S.W., Washington, D.C. 20202-4605.

Diversity Policy

The University of New Haven is committed to achieving a diverse and pluralistic community that reflects the multiracial and culturally diverse society in contemporary America. The Diversity Committee (a standing committee of the University) has been established to guide the University in implementing the Diversity Policy. The University will work toward attracting and retaining a diverse faculty, staff, and student body for the purpose of creating a pluralistic scholarly community. The Committee will assist the administration in the development and implementation of programs and policies that support an enriched educational experience for a diverse University community. The University of New Haven does not discriminate in admissions, educational programs, or employment against any individual on account of that individual's gender, race, color, religion, age, disability, sexual orientation, or national or ethnic origin.

Drug-Free and Smoke-Free Environment

Drug-Free Policy

In accordance with federal law concerning a drug-free campus environment, relevant University policy and regulations are provided for students and employees. Upon request, information is available from Student Affairs.

Smoke-Free Policy

In order to provide a healthful, comfortable, and productive campus environment for UNH faculty, staff, students, and guests, the University of New Haven has adopted a smoke-free policy.

No smoking is allowed in any campus administrative, academic, or recreational building. This restriction applies to all UNH offices, classrooms, hallways, stairwells, restrooms, dining facilities, conference/meeting facilities, athletic facilities, and any other public spaces within these buildings. Smoking is limited to areas that are twenty feet away from entrances to University buildings. Signs placed on the entrances inform everyone of the policy, and ash receptacles are placed twenty feet away from entrances. This is not meant to be punitive to those who smoke but only to allow everyone to enter our buildings without breathing unwanted smoke. It is our responsibility as University community members to gently inform those who are not following the rules to please move away from the entrance. Smoking in residence halls is restricted to rooms, suites, and apartments that have been designated as allowing smoking as agreed upon by the roommates. Smoking is not allowed in lobbies, hallways, laundry rooms, meeting rooms, community rooms, or any other public spaces within the residence halls.

Cooperation is expected from all members of the University and their guests. To register a complaint against a non-compliant individual, contact either of the following offices:

Student Affairs: 203.932.7199
Human Resources: 203.932.7240

This policy applies to all UNH facilities in West Haven and Southeastern operations, as well as to off-campus class sites and other locations where UNH may, in the future, establish operations.

Student Right-to-Know and Campus Security Act

In accordance with Connecticut Public Act 90-259 concerning campus safety and the 1990 federal law PL101-542 (the Student Right-to-Know and Campus Security Act), all colleges and universities receiving state and federal financial assistance are required to maintain specific information related to campus crime statistics and security measures, annually provide such information to students and employees, and make the data available to prospective students and employees upon request.

At the University of New Haven, the required information is compiled and published annually by the University Police Department.

Policy on Cell Phones and Beepers

Ringing cell phones and beepers are disruptive to classes, presentations, productions, and other public events. As a matter of courtesy, the University of New Haven requests that communication devices be turned off or disabled during classes or public events. Individual discretion should be used to determine when to make exceptions related to emergency personnel or situations.

TUITION, FEES, AND FINANCIAL AID

Following are the tuition, fees, and charges effective for the fall 2009 term. The University reserves the right, at any time, to make whatever changes it may deem necessary in admission requirements, fees, charges, tuition, policies, regulations, and academic programs prior to the start of any class, semester, trimester, or session.

Master's Tuition

Auditor, per credit, for UNH alumni, ...$100
Tuition, per credit $700
Tuition, per 3-credit course $2100
Executive M.B.A., complete program $49,840
M.S. in Engineering Management, complete program $44,010
Cohort Certificate Programs (12 credits) $9,780
M.S. in Industrial and Organizational Psychology (2 years).....$39,120
M.S. in Education Internship 727 (1 year)....No tuition fee (except for student fees)
M.S. in Education Capstone 727 .....$25,200
M.S. in Education Professional Education 728.....$25,200
Student Teaching (only with 727 Program) $4,200
M.B.A. Cohort.....$39,120
M.P.A. (2 years).....$34,230
M.S. Computer Science Cohort $39,120
M.S. Labor Relations Cohort $24,450
M.S. Taxation Cohort $24,450
Auditor, per credit $150
E 600, English Language Workshop.....$2100
Crediting examination.....$300

Master's Nonrefundable Fees

Application.....$50
Executive MBA application $50
Auditor application.....$50
Continuing registration $150
Co-op registration, full-time.....$150
part-time $75
Graduate Student Council, per term $20
Graduation refiling.....$50
Health insurance (per year, all full-time domestic students).....$240
International student acceptance $200
International student health insurance premium (per year).....$700
Laboratory.....$60–$310
Late payment (after scheduled due date)*.....$50
Late registration, current students $25
Technology, per trimester $25
Comprehensive examination $300

Doctoral Dissertation Nonrefundable Fee

Dissertation copyright and filing $125

*A late fee of $50 plus 1.5 percent per month penalty will be assessed on outstanding balances.

Technology Fee

The technology fee entitles each student to one copy of Microsoft Office for the Mac or PC, which can be used during study at UNH and retained upon graduation from the University. Other benefits of the technology fee include upgrades to library and lab computers, installation and support of the wireless network, and student tech support and staffing.

Payment

A deposit of $40 per course must be paid at the time of registration; the balance is due no later than the end of the first week of classes. The deposit is not refundable should you decide not to enroll in the courses for which you originally registered. If payment is made by American Express, MasterCard, or VISA, please include your card number, expiration date, and 3-digit security code.

For students who have not completed payment of tuition and fees by the end of the first week of classes, a charge of $50 plus 1.5 percent per month will be assessed on outstanding balances. An invoice for final payment will not be available through epay until after the due date has passed and late fees have been assessed.

Note: A tuition receipt from the Bursar's Office does not guarantee a reserved seat in class; only that tuition and fees have been paid.

Students are responsible for payment of tuition to the University, even though they may be eligible for their employer's tuition reimbursement plan. Students are responsible for making arrangements with their employers for reimbursement.

The University withholds the giving of grades, the awarding of diplomas, the issuance of transcripts, and the granting of honorable dismissal to any student whose account is in arrears.

Withdrawal

A student may withdraw from a course through the seventh week of the trimester without a notation on the transcript. After the seventh week, withdrawal from a course may be granted only by the instructor, and a grade of W is recorded on the student's transcript at the end of the term.

To be eligible for a cancellation or refund of tuition charges, students must formally withdraw from the course under the University's self-service on-line registration system. The date of online withdrawal determines the amount of the refund, if any, due the student.

Refunds

The refund policy for graduate students who withdraw from any course or from any program (with the exception of the Executive Master of Business Administration, Master of Science in Engineering Management, the Master of Business Administration cohort, and the Human Nutrition programs) is as follows: 100 percent cancellation of tuition upon formal withdrawal prior to the first regularly scheduled class meeting; 80 percent cancellation of tuition upon formal withdrawal prior to the second regularly scheduled class meeting; 60 percent cancellation of tuition upon formal withdrawal prior to the third regularly scheduled class meeting; 40 percent cancellation of tuition upon formal withdrawal prior to the fourth regularly scheduled class meeting; 20 percent cancellation of tuition upon formal withdrawal prior to the fifth regularly scheduled class meeting. No cancellation is made after the fifth regularly scheduled class meeting. Any refund amount is credited to the student's UNH account or, if requested, may be credited to the student's credit card account or issued directly as a check.

No refunds are made for courses taken and subsequently waived.

The refund policy for the Executive MBA program is as follows: for EMBA students who withdraw after completion of one module or less, one-half of the year's tuition is cancelled.

Information regarding the refund policy for the Human Nutrition program is available from the director.

Financial Aid

The University of New Haven offers a comprehensive program of financial assistance to qualified students, including assistantships and student loans. Application procedures for financial assistance are

detailed below and are also available at the UNH website (www.newhaven.edu).

Financial aid award decisions are made after careful consideration of a student's application for assistance. Eligibility for financial aid is based on financial need. Need is determined by subtracting the Expected Family Contribution (EFC), as determined by the federal "needs analysis" formula using the financial information provided on the Free Application for Federal Student Aid (FAFSA), from the Cost of Attendance. In calculating need, the Financial Aid Office attempts to consider all aspects of a student's financial circumstances and to meet the need for aid through a package of assistance, generally consisting of a combination of subsidized and unsubsidized loans and, when applicable, merit-based awards; i.e., assistantships and fellowships. Need-based financial aid programs are available to matriculated students who are U.S. citizens or eligible non-citizens who are matriculated and enrolled on at least a half-time basis. Merit-based programs are open to all matriculated students.

Need-Based Programs
(U.S. citizens and eligible non-citizens only)

- **Subsidized Federal Stafford Loans—**The Federal Stafford Loans are need-based loans. Eligible students may borrow up to $8,500 per academic year. The interest is federally subsidized. Repayment begins 6 months after graduation or withdrawal from the University or enrollment below half-time status. Exit interviews must be conducted prior to a student's graduation or withdrawal.

Non-Need-Based Programs
(U.S. citizens and eligible non-citizens only)

- **Unsubsidized Federal Stafford Loans—**A loan program created by the Higher Education Amendments of 1992 for students who do not qualify, in whole or in part, for subsidized Federal Stafford Loans. The terms for unsubsidized loans are the same as the terms for subsidized Stafford Loans except for the following:

  Interest accrues while the student is in school and during periods of deferment. The federal government does not pay the interest. The student can make monthly or quarterly payments to the lender, or the student and the lender may agree to add the interest to the principal of the loan (capitalization).

Note: A student must submit a complete financial aid application and be considered for a subsidized Federal Stafford Loan before the Financial Aid Office can process an Unsubsidized Federal Stafford Loan. Eligible students may borrow up to $12,000 in unsubsidized loan funds per academic year. For updated information on Stafford loan interest rates please refer to the UNH website.

Merit-Based Programs
(open to matriculated students)

- **Assistantships—**Assistantships are competitive appointments available to full-time students. Graduate assistants may work up to 20 hours per week and receive an hourly compensation as well as 50 percent tuition support. Applications for assistantships are made available in early spring for the following year. Applications and further information may be obtained via the University website. The majority of assistantships are awarded as part of the admissions process. Students are notified at the time of admission to the University if they have qualified for an assistantship. An open application process for any unfilled positions is held annually in May. Appointments are made for the academic year starting in September.

Alternative Financing Options

Alternative financing options are available to assist students in paying for their educational expenses up to their Cost of Attendance. Eligibility for supplemental loans is not based on financial need or a financial aid application. Generally, students must be enrolled at least half-time and must undergo a credit review to qualify. The Graduate PLUS loan is a federal alternative loan for which students may apply if they have already been approved for and awarded Stafford loans. For updated information on Graduate PLUS loan interest rates and terms please refer to the UNH website. There are several other

alternative loan options with private lenders. More information regarding these loans and financing options is available on the UNH website.

Application Procedure

Applications for graduate financial aid are accepted on a rolling basis throughout the academic year. However, to ensure that aid is awarded in a timely manner and is available at the beginning of each trimester, students should adhere to the following priority application deadlines. Students applying for need-based and non-need-based assistance must submit the documents listed below by March 1 for the fall trimester/academic year; October 15 for the winter trimester; and January 15 for the spring trimester.

- **Free Application for Federal Student Aid (FAFSA)—**This form is required to apply for financial aid from federal student financial aid programs. The UNH code number is 001397. Students can complete the FAFSA on the Internet at www.fafsa.ed.gov, or via the link on the UNH website.
- **Verification—** A student may be selected for a process called verification by submitting an aid application and completing the FAFSA. Selected students are required to submit a signed and completed verification worksheet (provided by the University) and signed copies of their federal income tax return (and those of their spouses, if applicable), including all pertinent schedules and W-2 forms.
- **Additional Information—**Other forms and documents may be requested as the aid application is reviewed.

Financial Aid Refund Policy

Students who withdraw from courses prior to the end of the fifth week of the trimester may be entitled to a full or partial refund of tuition charges. Refunds of charges and financial aid are based on the institutional refund policy, as described in the academic policies section of the University catalog, and on the Return of Title IV Funds calculation, as required by Section 484B of the Higher Education Act. Federal regulations require that any unearned Title IV aid be returned to the program(s) that provided the funds.

Return of Title IV Funds

A withdrawal requires that the University calculate the amount of unearned aid a student has received. The University must do the following:

- Determine the student's official withdrawal date as documented in the Registrar's Office. The withdrawal date is used to determine the percentage of the payment period completed and, therefore, the amount of aid a student earned. Students who have completed more than 60 percent of the term are not subject to the federal calculation.
- Determine the amount of aid earned by the student. The University calculates earned aid by multiplying the total aid disbursed or which could have been disbursed (excluding Federal Work Study) by the percent of the payment period the student completed.
- If less aid has been disbursed than a student has earned, then a post-withdrawal disbursement must be made. The University notifies the student in writing within 30 days of the withdrawal date if a post-withdrawal disbursement is available. The student must respond within 14 days of notification in order to receive the funds. The student may accept all or part of the post-withdrawal disbursement. If more aid was disbursed than earned, then the University, the student, or both must return all unearned aid in a specific order:
    1) Unsubsidized Stafford Loans
    2) Subsidized Stafford Loans
    3) Federal Perkins Loan
    4) Federal PLUS Loan
    5) Federal Pell Grants
    6) Federal Academic Competitiveness Grant
    7) Federal SMART Grant
    8) Federal SEOG
    9) Other Title IV assistance for which return of funds is required

Students are responsible for repaying all unearned aid a school is not required to return, as well as any balance created on their University bursar account by the application of the Title IV return of funds formula. The University notifies the student in writing

within 30 days of determining an overpayment. Students must repay as follows:

- Loans — repayment according to terms of the loan
- Grants — repayment is 50 percent of unearned grant.

Students who owe Title IV grant repayments have 45 days to pay as follows:

- Repay in full.
- Make arrangements to repay the University.
- Make arrangements to repay the U.S. Department of Education.

Students who fail to take positive action to repay their grants are reported to the Department of Education and the National Student Loan Data System (NSLDS) immediately after the 45-day period has elapsed. Additional information and examples of refund calculations are available in the Financial Aid Office.

Academic Requirements for the Retention of Financial Aid Eligibility

Students must be making satisfactory academic progress and be in good academic standing in order to be eligible to receive financial aid. Graduate students must successfully complete all the credits for which financial aid has been awarded, as indicated on their financial aid award letter. "Successful completion" is defined as the receipt of a passing grade (A to D-). Grades of F, W, U, DNA, or INC are not considered successful completion. Graduate students must maintain a minimum 3.0 cumulative quality point ratio (QPR) in order to be in good academic standing.

Internships

Internships enable students to integrate the experiential learning of the workplace with the theoretical work of the classroom. The Career Services Office provides résumé and interviewing assistance in preparation for internship participation. Internship employers include large corporations, small businesses, government agencies, and nonprofit organizations. Some degree programs require academic internships. In disciplines where Internships are not required, it is still highly recommended that students undertake at least one internship experience before graduating. This is called a co-curricular internship. Certain requirements must be met for eligibility for academic, credit-bearing internships. Whether academic or co-curricular, internship assignments may be 1) full-time or part-time, 2) undertaken during the school year or the summer, and 3) of varying duration. Students interested in registering for an academic internship should contact the faculty advisor in their program of study. Students interested in co-curricular internships should review the internship web page on the UNH website, and then contact the Internship Office with specific questions.

ACADEMIC AND STUDENT SERVICES

Academic Services

Campus Bookstore

The Campus Store provides required texts, both new and used, for courses at the University. Used textbooks may be sold back to the store throughout the year. The bookstore staff will also place special orders for any book in print.

The Campus Store carries course-related supplies, greeting cards, imprinted clothing and gifts, candy, and a selection of magazines and paperbacks. It also handles orders for class rings and school chairs.

The bookstore will ship books and other items to any home or business address. Simply go to www.efollett.com or unh.bkstr.com to order.

Special educational discounts on computer software are available at efollett.com to faculty and students who have a current UNH campus ID card. A computer software catalog is available by calling 203.933.4000.

Center for Dispute Resolution

The Center for Dispute Resolution at the University of New Haven is a focal point for the interdisciplinary study and practice of dispute resolution. The Center facilitates interdisciplinary research and offers program evaluation and conflict management services to individuals and to businesses, institutions, governmental agencies, and community organizations. Conflict management services include mediation, design of conflict management systems, consultation, and training. Through educational programs for students and the community-at-large, the Center also strives to advance the understanding and application of alternative means of dispute resolution, including mediation.

Center for Family Business

The goal of the Center for Family Business, founded in 1994, is to strengthen family firms, the backbone of Connecticut's economy. Our mission is to foster the health and continuity of family businesses by providing a variety of educational and informational services to family business owners and their advisors. We seek to balance the well-being of the business, the family, and the individuals involved, to provide opportunities for our members to develop business and advisory relationships with each other, and to strengthen the economic base of Connecticut.

The accounting firm of Bailey, Schaefer and Errato, LLC; Charter Oak Insurance; Daniel M. Smith & Associates; Highland Capital; and the law firm of Wiggin and Dana are board members of and investors in the CFB.

The Center for Family Business holds conferences and forum groups throughout the year for its membership, presenting programs by nationally recognized speakers. The Center provides access to a national family business network and to business programs and services, consultations, and seminars.

Center for Learning Resources

The Center for Learning Resources (CLR) provides free tutoring and writing skill assistance to students seeking extra help with their studies. The tutoring staff — more than twenty-five tutors in all — are experienced instructors who hold advanced degrees in their respective fields and who are committed to aiding the learning process. Our highly competent graduate and undergraduate student tutors are chosen based on the recommendations of their professors. Tutoring is available six days a week, following the undergraduate calendar. The CLR is located in Maxcy Hall, rooms 106–110.

The CLR comprises three labs: the Mathematics, Science, and Business Lab; the Writing Lab; and the Computer Lab. Math Lab tutors are available by appointment and for drop-in help with math assignments. Writing Lab tutors are available by appointment and for drop-in help with writing assignments. The Computer Lab is supervised by a graduate student tutor and provides access to Microsoft software, SPSS, math tutorials, and Internet research.

Center for the Study of Crime Victims' Rights, Remedies, and Resources

The UNH Center for the Study of Crime Victims' Rights, Remedies, and Resources is housed in the Henry C. Lee College of Criminal Justice and Forensic Sciences, and supports initiatives that enhance the knowledge base concerning crime victims' rights and services. The Center's mission is to "improve rights and services for victims and survivors of crime by enhancing our knowledge and the transfer of knowledge from research to practice through education, training, technical assistance, and research opportunities for advocates, service providers, and allied professionals." These initiatives are variously statewide, regional, and national in scope. They include degree and certificate instructional programs; field and program evaluation research services; internships, fellowships, and visiting scholar programs; legal, legislative, and public policy analysis and advocacy; and publications, conferences, and symposia. The Center is also the University's link to the Joint Center for Violence and Victim Studies' inter-University consortium. Information is available through the director's office.

Information Services: Computer Labs

Information Services provides for the computing needs of both academic and administrative users by maintaining a number of computer labs. The largest installation of general-use computers and printers is in the Marvin K. Peterson Library. Installed software includes web browsers, Microsoft Office, SPSS, and other university-standard software. There are also Apple iMacs are available in the Library, Bartels Hall Lobby, and the Beckerman Recreation Center (2nd floor). Additional labs are located throughout the campus, are discipline-specific, and are used primarily for instruction.

Special-purpose computing facilities include the Industrial Engineering CAD/CAM lab in Buckman, the AT&T multimedia lab in Buckman 227, the Electrical Engineering lab in Buckman 203, the System Engineering lab in Buckman Hall, the Graphic Arts labs in Dodds 203 and 207, the Biology and Environmental Science (GIS) lab in Dodds 305, the Mechanical Engineering Instrumentation lab in Buckman 223, the Math and Physics Department lab in Maxcy Hall, the Hospitality and Tourism lab in Harugari 114, the Internet Crime lab in Dodds 101, a faculty lab in Echlin 119, and the UNH Southeastern lab at Mitchell College in New London. For availability of these labs, contact the given department's administrative staff.

The hours for open labs change each trimester. Go to http://www.newhaven.edu/computerlabs for current lab hours.

Information Services: Computer Service

Information Services provides complete service for student-owned computers. The Student Technical Support Office is located at 115 Echlin Hall, and provides hardware and software support for PCs, Macs and Unix machines, including hardware repair and software installation. Please note that the Support Office does not sell or stock parts. Students must obtain any needed replacement parts, which the office will then install. The office helps students obtain warranty replacement parts when appropriate. The office also administers the campus software licensing program.

Information Services: How to Obtain Software

Each student is entitled to an educational-license copy of Microsoft Office, which may be obtained in

either the Student Support Office (Echlin 115) or the Campus Card Office (Echlin 114). Additional software titles and anti-virus software are also available, at $15 per title, payable at the Bursar's Office. The Adobe Creative and Web Standard bundles are also available for a significantly higher fee. Pay the fee at the Bursar's Office and present your receipt when picking up the software.

Marvin K. Peterson Library

The Marvin K. Peterson Library, named in honor of a former University president and dedicated in 1974, includes three floors of reading space, an Information Commons, Jazzman's Café, group study rooms, stacks, and reference areas. Six iMac, 54 desktop and 36 laptop computers are available for research purposes. Wireless networking is available in all areas of the library. Students and faculty can plug in their laptop computers to connect to the campus network at more than 100 ports throughout the library's three floors. Materials are stored in a variety of formats including online, print, audio, video, microform, and CD-ROM or DVD.

The library's home page is available via the Web at http://www.newhaven.edu/library. It serves as a gateway to information and library services and includes the library's online catalog, which allows for both basic and advanced searching of library holdings. To borrow library materials, a valid UNH ID card must be presented at the circulation desk. Books already borrowed can be renewed online. Recent additions to the collection are listed on the library's home page. Library guides, prepared by professional librarians, are posted. Interlibrary loan forms for students and faculty are available online. Electronic access to more than 19,000 full-text electronic journal holdings is accessible from a link on the home page. Faculty and students in their offices or residence halls or at home have access to a variety of commercial online databases on the library's home page.

UNH subscribes to online electronic databases in all subjects. Resources, including full-text books and journal sources, are accessed in online databases such as ABI/INFORM, Criminal Justice Periodicals Index, Education Complete, Expanded Academic Index ASAP, Engineering Village and Compendex Web, FirstSearch, CCH Online, GPO Access, PsycARTICLES, ProQuest Computing, Psychology and Behavioral Sciences Collection, WestLaw, Hoover's, Science Direct, Reference USA, Country Watch, Literary Reference Center, and IRIS.

The UNH library collection includes more than 250,094 volumes, electronic access to over 19,000 full-text journal and newspaper titles, 544,926 pieces of microfiche, 12,265 volumes of microfilm, and 159,771 paper U.S. Government Documents.

The main library is a U.S. Government Documents Depository Library and selects approximately one third of the U.S. government yearly output to support UNH programs.

UNH students may borrow materials from the Albertus Magnus College Library. Students who obtain a borrowing card from a Connecticut public library may borrow from other public libraries statewide. As a member of Online Computer Library Catalog (OCLC), UNH has access through interlibrary loan to the holdings of more than 10,000 member libraries' 110,000,000 records. The library uses telefacsimile and electronic means to transmit articles and information to and from other libraries across the country.

Students are assisted by professional reference librarians by telephone (203.932.7189), e-mail (LibraryHelp@newhaven.edu), or online via a 24/7 online chat service, InfoAnytime. One-on-one consultations are available to locate information for research papers and projects. Subject-specific library orientations are available for upperclass and graduate students. Library instruction courses geared to international students are also provided.

Library guides, as well as selected instructional support resource materials, are provided; and a reserve collection is in place to support courses taught at UNH. Library guides and online tutorials help facilitate access to information resources for effective research. Sample topics covered include education, psychology, national security resources, dietetics and nutrition, criminal justice, biology, dental hygiene, management resources, an AP Style Guide, citation management in databases, and an introductory research guide.

The UNH Foundation

The role of the UNH Foundation is to initiate, facilitate, and participate in programs and projects aimed at furthering the educational endeavors of the University.

The Center for Family Business is administered under the auspices of the Foundation. The Center for Family Business provides programs and services designed to meet the unique needs of those involved in family-owned and/or operated businesses.

The Center provides members with opportunities to learn from nationally acclaimed speakers on a wide variety of relevant topics. Members also enjoy opportunities to interact and network. The Center facilitates a variety of small-group forums for segments of its membership such as managers, leaders, successors, and women. Forum members meet monthly to discuss issues of importance to their group.

Student Services

Alumni Relations

Students are eligible for membership in the Alumni Association immediately upon graduation. Non-degreed students are eligible for membership upon completion of 12 graduate credits or 27 undergraduate credits. There are currently more than 40,000 eligible alumni.

Alumni Association members enjoy special privileges such as use of the library, special rates to audit classes, and access to UNH Online, the online community of over 40,000 graduates of UNH. Alumni can search the directory, review job postings and résumés, post class notes, sign up for a UNH forwarding email address, and more. Permanent lifetime membership ID cards are issued to Alumni Association members soon after graduation.

University of New Haven, the alumni magazine, is mailed to all members regularly. Alumni Weekend, class reunions, an annual Scholarship Ball, and other educational and social events offer opportunities for continued contact with UNH and fellow alumni.

Regional alumni gatherings across the nation offer additional opportunities for active involvement. The Alumni Relations Office sponsors social and career networking receptions, seminars, family-oriented events, fundraising, and sporting activities.

The Alumni Board of Directors governs the association with the assistance of additional alumni volunteers. The Board serves as an advisory group to the University, working to strengthen bonds by promoting communication between alumni and the UNH community.

Campus Recreation

The David A. Beckerman Recreation Center provides more than 56,000 square feet of fitness space for the University community. Access to the facility is free for enrolled part-time and full-time graduate students. Highlights of the state-of-the-art facility include 43 cardiovascular machines, dedicated free-weight space, an indoor walking/running track, 2 group fitness studios, 2 hardwood activity courts, and a full size multi-activity court (MAC). Open more than 100 hours a week, the facility offers flexible use times convenient for both undergraduate and graduate students.

Typical hours of operation are as follows:

Monday–Thursday, 6:30 a.m.–11:30 p.m.
Friday, 6:30 a.m.–11:30 p.m.
Saturday, 9 a.m.–7 p.m.
Sunday, Noon–10 p.m.

In addition to the Beckerman Center, the Department of Campus Recreation offers dedicated staff to program group fitness, personal training, and RecSports. Free classes include Spin, Cardio Kick, and Body Blast, to name a few. While the RecSport offerings change throughout the year, there are many different activities to choose from including flag football, basketball, floor hockey, volleyball, and soccer.

This is just a glimpse of the recreational opportunities available for graduate students. To learn more, go to the campus recreation website, stop by the Beckerman Center Welcome Desk, or call direct at 203.931.2965.

Career Services Center

The mission of the Career Services Center is to contribute to the lifelong career advancement of students and alumni and to the continued development of a vibrant network of alumni, students, faculty, and friends. The mission will be supported by the overarching goal of **EMPOWER**ing the University's constituencies through **E**ducation, **M**otivation, **P**ersonal development, **O**pportunities, **W**isdom, **E**mployment, and **R**eporting.

The Career Services Center provides services for students, alumni, faculty, and employers. These services include assisting with career planning and job searching, preparing and reviewing résumés and cover letters, mentorship opportunities, and interviewing skills. Individual appointments may be scheduled by calling 203.932.7342. The Career Services Center may also be contacted through email at jobs@newhaven.edu or through our website, www.newhaven.edu/careerservices.

Counseling Center

The Counseling Center in the lower level of Sheffield Hall offers assistance and counseling to students with personal problems. The Center also offers testing, including learning disability evaluations and vocational interest testing. For students who do not know where to go for help with a problem, the Counseling Center serves as a resource for information and direction.

Dental Center

The University of New Haven Dental Center is the clinical education site for the University's dental hygiene students. Student dental hygienists, under the supervision of licensed faculty, provide preventive dental services to the public, including dental examinations, prophylaxis (cleanings), oral hygiene instructions, fluoride treatments, pit and fissure sealants, and radiographs.

Fees are charged according to the client's UNH employee/student status. For more information or to schedule an appointment, call 203.931.6028.

Disability Services and Resources

The Disability Services and Resources Office handles referrals regarding any student with a disability, whether temporary or permanent. The director provides guidance, assistance, and information for students with disabilities and assists the University's ADA coordinator with oversight of the University's compliance with Section 504 of the HEW Rehabilitation Act of 1973, the Americans with Disabilities Act, and other governmental regulations.

Referrals and inquiries concerning any matters relating to students with disabilities, accessible facilities, and/or reasonable accommodations should be directed to this office. In order to receive accommodations for a disability, students must initiate a request for services. It is the responsibility of the student to make his/her needs known by self-identifying as a student with a disability. To do so, the student should contact the Director of the Disability Services and Resources Office and submit the required documentation of the disability upon acceptance to the University. These records are considered confidential and are maintained in the office, separate from other school records. It is not a requirement that documentation be submitted with your application for admission.

The Disability Services and Resources Office is located on the ground level of Sheffield Hall, in the rear of the building, and the director can be reached at 203.932.7332. The vice president for Facilities has been designated as the University's 504/ADA coordinator and can be reached at 203.932.7147.

Food Services

University Dining Services consist of the Marketplace Food Court, Jazzman's Café, Pandini's, Sky Ranch Grill, Sandella's, the Quad Convenience Store, and University Catering. The Marketplace, Jazzman's, and University Catering are located in Bartels Hall. A second Jazzman's location can be found on the first floor of Peterson Library. Pandini's and Sky Ranch Grill are located in New Hall. Sandella's and the Quad C-Store are located on the first floor of Botwinik Hall.

Offerings of the various Dining Services are listed below.

Marketplace Food Court:
Hometown (hot buffet)
Top Hits (sautés and stir fries made to order)
Deli favorites
Mediterranean (vegan, vegetarian, and pasta)
Pizza and calzones
The Grill
Baked goods and desserts
Salad bar, soups, and beverages

Jazzman's Café:
Gourmet coffee, cappuccino, and espresso
Fresh-baked muffins, scones, etc.
Sandwiches, salads, and snacks
Fruit smoothies and cold beverages

Pandini's:
Freshly made pizza
Baked and sautéed pasta
Strombolis and calzones
Italian sandwiches
Entrée salads
Desserts and beverages

Sandella's:
Wraps and sandwiches
Paninis
Quesadillas
Pizza

Sky Ranch Grill:
Freshly grilled burgers
Grilled and fried chicken
Local favorites
Side dishes and salads

The Quad Convenience Store is open 7 days a week and offers a wide selection of groceries, snacks, beverages, sundries, and health and beauty products. Please call or visit us. We welcome your comments and suggestions. Our office is conveniently located on the lower level of the Campus Center.

Graduate Housing

Limited University housing for graduate students is available. In addition, University College maintains a listing of off-campus housing accommodations that includes apartments, houses, and private rooms. The University does not screen these listings and takes no responsibility for the condition of the room or apartment or for the rents asked, but the listings are an excellent source to assist graduate students in locating housing.

Health Services

The University's Health Services Center, on the lower level of Sheffield Hall on the Main Campus, is open to all students without charge. The center is staffed by registered nurses, a part-time nurse practitioner, and a part-time physician. A weekly women's clinic is staffed by nurse practitioners. Health Services provides initial care for minor illnesses and injuries as well as diagnosis, referral, and follow-up care for more serious conditions. The Center is also a resource for information about medical questions and about other medical facilities in the community.

Full-time students entering the University must comply with state laws regarding immunizations for measles and rubella. Applicants to the Graduate School must complete the Immunization Form and return it to the UNH Health Services Office. In addition, students enrolling at UNH for full-time study must also file a completed Health Examination Report with the Health Services Office. Medical forms and information can be obtained by contacting the Health Services Office at 203.932.7079 or 1.800.DIAL.UNH, ext. 7079, or on the website.

Connecticut law requires that each student who resides in University-owned housing be vaccinated against meningitis as a condition of such residence.

In case of noncompliance, it is the policy of the University to withhold registration at the beginning of each term.

International Services Office

The presence of international students at UNH helps to make the University truly a global village. Our campus community is rich in cultures, ethnicities, languages, nationalities, politics, religions, and traditions. To encourage multicultural awareness through interaction with international students, the International Services Office (ISO) provides assistance to the University's diverse international student population, which comprises undergraduate and graduate students from nearly fifty countries. The staff assists students with immigration matters; provides liaison with sponsoring agencies and foreign governments; coordinates campus and community services; and promotes interaction among the international population, the University, and the communities of greater New Haven. The ISO provides information on travel to and from the United States and advises students on academic, social, and cultural adjustment. The ISO also coordinates and organizes various campus programs and activities, including international coffee hours, cultural celebrations such as Chinese New Year, an annual international festival, and graduate orientation sessions for international students. For more information, visit http://www.newhaven.edu/iso.

Office of University Advancement

The Office of University Advancement is the fundraising arm of the University and includes Alumni Relations, the Annual Fund, Development, and Public Affairs. University Advancement works with the University community to develop philanthropic support for enhancement of the University's programs, facilities, and endowment. Gifts to the University enhance student financial aid, faculty development, equipment, library resources, and other institutional opportunities for growth. The generosity of alumni, corporations, foundations, parents, and friends contributes to the excellence of the University of New Haven.

The Alumni Relations staff invites you to remain connected to the University and offers a variety of activities and benefits sponsored by the Alumni Association. Educational, athletic, and social events are scheduled throughout the year, including the annual Scholarship Ball, Alumni Weekend, Homecoming, and networking socials. The staff disseminates University news to alumni through the e-newsletter, UNH Alumni. Alumni can take advantage of benefits such as reduced costs for graduate study, career development, and discounts on home, auto, and health insurance. More information is available through UNH Online, an online directory and interactive community, at www.newhaven.edu/alumni. A board of directors oversees the Alumni Association. Send comments and suggestions to alumni@newhaven.edu.

The Annual Fund staff oversees the University's annual giving program which, through a student phonathon, solicits support from alumni and parents to fund ongoing needs such as financial aid, faculty support, equipment, and academic programs.

The Public Affairs staff disseminates University news to alumni through the University of New Haven magazine, and through e-newsletters representing the University's Colleges. Public Affairs communicates news on campus through the University's e-newsletter, UNH Today, which also is sent to parents and friends and to the general public through the news media. The staff also coordinates University special events.

Office of Intercultural Relations

The Office of Intercultural Relations assists the University in promoting cultural diversity, awareness, and sensitivity throughout the campus community. The office provides leadership in promoting an environment responsive to the diversity of groups represented at UNH. Its programs, services, and activities promote cultural identity within a multicultural environment, and encourage and support cooperative and collaborative relationships within the University community and with the University's external stakeholders.

This office seeks to advance the mission of the University of New Haven by providing students with opportunities to gain intercultural understanding and to succeed in an inclusive academic and social environment that respects the uniqueness and contributions of all community members.

The Office's initiatives include the following: presentation of social and educational events and workshops in residence halls and classrooms; development of a Diversity Resource Center (with books, magazines, music, and crafts, from different cultures) to serve as an educational resource for members of the campus community; and posting information about scholarship, internship, and job opportunities pertinent to underrepresented populations of students. For more information, please call 203.932.7427.

Campus Card Office/Parking Permits

The Campus Card is a credit-card-sized, color-photo identification that offers a number of services to the UNH community. It is the official UNH library card and residential meal plan card. It is also used for security access identification, printing in the computer labs, and other services. Money can be placed in a Charger Cash account and accessed via the Card at the UNH Bookstore, at all dining service locations, the Post Office, and numerous off-campus locations. New students must obtain a Campus Card, which is required in order to register for a parking permit. Campus Card photos are taken at Echlin Hall on the Main Campus. Campus Card office hours are posted at the beginning of each term; however, because the office is staffed by graduate and undergraduate students the schedule may occasionally change on short notice.

University Police Office

The University Police Office is located in the lower level of the Campus Bookstore. Staff members are certified police officers who undergo continuous training and who have been trained in emergency medical procedures, first aid, and CPR. They conduct regularly scheduled campus patrols and work closely with local, state, and federal agencies to enforce the laws of the State of Connecticut, especially those most pertinent to campus safety and security. The University Police Office is fully staffed 24 hours a day.

Veterans Affairs

Certification of veterans' educational benefits is a service provided by the Registrar's Office, which serves as a liaison between UNH student veterans and the Department of Veterans Affairs (DVA). The Office provides forms for DVA benefits, advises students on procedural requirements, and certifies enrollment. Both the DVA and the Registrar's Office closely monitor each student's status and academic program.

For information on eligibility and payment, or to apply for benefits, or to transfer your existing benefits to UNH, contact the DVA.

Department of Veterans Affairs
Regional Office
P.O. Box 4616
Buffalo, N.Y. 14240-4616
1.888.GI.BILL.1 (1.888.442.4551)
http://www.va.gov/Education/

The certification official's office is in the Graduate Records Department in South Campus Hall. If you have questions or concerns, contact the VA Certifying Official during office hours, Monday through Friday, 8:30 a.m. to 4:30 p.m., at 203.932.7304. The fax number is 203.932.7429.

Student Organizations

Alpha Phi Sigma–Alpha Tau Chapter

Alpha Tau is the local chapter of Alpha Phi Sigma, the National Criminal Justice Honor Society. Alpha Tau's purpose is to recognize and promote academic excellence among undergraduate and graduate students. The local chapter was formed in 1998 and embraces the full spectrum of criminal justice students, from criminal justice and forensic science to pre-law and the related social sciences.

Graduate students who have a 3.5 cumulative QPR and who have completed at least 12 credits of graduate work, or 9 credits of graduate work and at least 3 additional undergraduate credits, are eligible for membership.

Additional information may be obtained by contacting the Alpha Tau advisors, Drs. Tracy Tamborra and Fadia Narchet, in the Department of Criminal Justice.

Criminal Justice Club

The American Criminal Justice Association (ACJA) is a national professional and preprofessional organization with goals that include improved technology, training, and service for the benefit of the criminal justice system. The UNH local student chapter of ACJA is the Psi Omega chapter. This club offers students a variety of activities, including community service as well as the opportunity to meet and work with practitioners in the field. Students also meet others with similar interests and are eligible to participate in regional and national programs and activities.

Graduate Sports Management Club

The Management of Sports Industries program features a student club called the Graduate Sports Management Club. It serves as a networking group for current and former students. To help further their careers, members visit sports facilities, hold conferences, and meet with industry leaders. Members also often interact with the undergraduate Sports Industries Club.

Graduate Student Council

Founded in 1976, the Graduate Student Council has expanded through diverse programming and as a result of increased enrollment of graduate students. The Council is a student organization funded by the fee paid by graduate students each trimester. Thus, all graduate students enrolled at UNH are members and share in the activities of the Council.

The purposes of the council are to promote the welfare of Graduate School students, to give them counsel and support, to encourage their active participation in the determination of their academic environment, to develop their school spirit through social and other activities, and to convey student opinion to the University administration.

The council serves as a cultural, social, and educational organization through a variety of activities, including bi-annual receptions for graduating students, an annual class gift to the University, and other supportive services.

Lambda Pi Eta

The Beta Kappa Chapter of Lambda Pi Eta is the University's affiliate of the national honor society in communication. Founded in 1985, the chapter became an affiliate of the National Communication Association in 1994. The name represents what Aristotle described in his Rhetoric as the three modes of persuasion: logos, meaning logic; pathos, relating to emotion; and ethos, defined as character credibility and ethics. Lambda Pi Eta's purposes are to recognize, foster, and reward outstanding scholastic achievement; to stimulate interest in the field of communication; and to provide opportunities for dialogue among faculty and students interested in communication.

NAGPS Affiliation

The Graduate School is an affiliate of the National Association of Graduate Professional Students (NAGPS), a nonprofit organization dedicated to improving the quality of graduate and professional student life in the United States. NAGPS works to promote the interests and welfare of graduate students and graduate education at local, regional, and national levels.

The NAGPS website (www.nagps.org) has information about current lobbying efforts in the Congress on issues affecting financial aid, student loans, and taxation of tuition benefits. NAGPS also operates a Job Bank in a special section of the website. Graduate students enrolled at UNH are eligible for access to the Job Bank, as well as to the Fellowship/Scholarship and Grants databank, and can find additional benefits such as discounts on books and insurance and other information.

Psi Chi

The Department of Psychology supports a chapter of Psi Chi, the National Honor Society in Psychology. Founded on the UNH campus in 1976, the chapter is one of more than 840 in the U.S. The honorary society was founded at the Ninth International Congress of Psychology at Yale University in 1929 for the purposes of encouraging, stimulating, and maintaining excellence in scholarship, and advancing the science of psychology. Membership is open to graduate and undergraduate men and women who are making the study of psychology one of their major interests and who meet the minimum qualifications.

Sigma Beta Delta

Sigma Beta Delta is a national honor society in business, management, and administration with chapters at hundreds of business schools. The UNH College of Business chapter, which was chartered in May of 1994, is sponsored by College of Business faculty. High achieving College of Business undergraduate and graduate students are honored with initiation each year.

Student Publications

The Charger Bulletin is an entirely student-run newspaper. Reporting on national news, local news, and on the things that take place right here on campus, our staff writers work hard every week at covering the stories that are most interesting to students at UNH. Our flourishing "Arts and Entertainment" section covers everything from music and film reviews to gallery openings. We praise our Charger athletes on UNH's sports teams in addition to highlighting sports on a national level. Our editorials, from editors, staff writers, and the University community, raise issues and cause controversies, but most importantly, get people reading. Practical features like the "Campus Events" calendar and the "Charger Bulletin Board" keep the UNH community in the know, while features like the ever-popular positive/negative recap "The Charger Battery," comics, and puzzles are fascinating and fun for readers. With our great staff writers and photographers, The Charger Bulletin continues to be something that the University community enjoys reading, and it remains the first place students turn for news. Our initiative at The Charger Bulletin is to inform the University of New Haven students and faculty about what matters most to them. In addition to producing a weekly printed issue of the newspaper, The Charger Bulletin can also be read online at www.chargerbulletin.com.

WNHU Radio

WNHU, the University's student-operated radio station and FM stereo broadcast facility, is operated by the Communication, Film and Theatre Department of the College of Arts and Sciences throughout the year on a frequency of 88.7 MHz at a power of 1,700 watts. The station has a 30-mile radius on the FM band, serving Southern Connecticut and eastern Long Island, and is also broadcast live online at www.wnhu.net. This extracurricular enterprise, open to undergraduate and graduate students, provides listeners with news, sports, weather, and music. The WNHU broadcast day features a variety of musical genres and styles played from 6 a.m. to 2 a.m., seven days a week, every day of the year.

Most WNHU activities in programming, business, and engineering operations are performed by students in the University's day, evening, and graduate divisions. The station personnel will train qualified students in their respective areas of interest; no prior radio experience is necessary.

ACADEMIC PROGRAMS BY COLLEGE

College of Arts and Sciences

Graduate Degree Programs

Cellular and Molecular Biology, M.S.
Community Psychology, M.A.
Education, M.S.
    Teacher Certification
    Professional Education
Environmental Science, M.S.
Human Nutrition, M.S.
Industrial/Organizational
    Psychology, M.A.

Graduate Certificates

Applications of Psychology
Bioinformatics
Forensic Psychology
Geographical Information Systems
International Relations
Legal Studies
Psychology of Conflict Management
Telecommunication Management

College of Business

Graduate Business Degree Programs

Business Administration, M.B.A.
Emerging Leaders, M.B.A.
Executive, M.B.A.
Management of Sports Industries, M.S.
Taxation, M.S.

Other Graduate Degree Programs

Public Administration, M.P.A.
  M.B.A./M.P.A., dual degree
Health Care Administration, M.S.
Labor Relations, M.S.

Graduate Certificates

Accounting
Business Management
Finance
Health Care Management
Human Resources Management
International Business
Long-Term Health Care
Management of Sports Industries
Marketing
Public Administration
Public Management
Taxation

Tagliatela College of Engineering

Graduate Degree Programs

Computer Science, M.S.
Electrical Engineering, M.S.
Environmental Engineering, M.S.
Engineering Management, M.S.
Industrial Engineering, M.S.I.E.
M.B.A./M.S.I.E., dual degree
Mechanical Engineering, M.S.M.E.

Graduate Certificates

Civil Engineering Design
Computer Programming
Lean/Six Sigma
Logistics
Quality Engineering

Henry C. Lee College of Criminal Justice and Forensic Sciences

Graduate Degree Programs

Criminal Justice, M.S.
Fire Science, M.S.
Forensic Science, M.S.
National Security and Public Safety, M.S.

Graduate Certificates

Criminal Justice Management
Fire/Arson Investigation
Fire Science Technology
Forensic Psychology
Forensic Science/Forensic Computer Investigation
Forensic Science/Advanced Investigation
Forensic Science/Criminalistics
Forensic Science/Fire Science
Information Protection and Security
National Security
National Security Administration
National Security Technology
Public Safety Management
Victim Advocacy and Service Management

COLLEGE OF ARTS AND SCIENCES

Ronald H. Nowaczyk, PhD, Dean
Jerry L. Allen, Ph.D., Associate Dean
Rosa A. Mo, Ed.D., Interim Assistant Dean

Graduate programs in the College of Arts and Sciences offer opportunities for career preparation through the conscientious application of core liberal arts and sciences disciplines. Faculty with practical experience and engaging learning approaches work closely with students to cultivate their professional identities, skills, and awareness of global trends and challenges in their chosen fields. Graduate courses are offered through all Arts and Sciences departments.

The College of Arts and Sciences, through the Graduate School, offers master's degree programs in six fields: master of science degrees in cellular and molecular biology, education, environmental science, and human nutrition; master of arts degrees in community psychology and industrial organizational psychology.

Within the field of education, students may select either a teacher certification program, which has an optional full-time internship experience, or an advanced professional education program for those who already hold certification. The human nutrition program is offered part time, one weekend per month, at the main campus in West Haven. The environmental science program provides many opportunities for field and laboratory experience along with classroom instruction. Students in cellular and molecular biology are training for specialized careers in the fields of bioinformatics, basic science, and pharmacological research.

Graduate certificates provide short, specific course work in several fields, including geographical information systems (GIS) and the psychology of conflict management.

At the undergraduate level, the College of Arts and Sciences offers associate and bachelor's degree programs in a wide variety of fields, from art and graphic design to dental hygiene, from music and sound recording to psychology, and a liberal studies degree. A combined five-year B.S./M.S. program in environmental science is offered for students who meet certain qualifications. UNH undergraduates who want to pursue a teaching career also may be eligible for early admission to the UNH Education Department through the accelerated entry process, which allows qualified undergraduates to begin their education course work as undergraduates and enables them to earn a bachelor's degree, master's degree, and Connecticut teacher certification in five years. The College of Arts and Sciences sponsors a variety of cultural, educational, and artistic endeavors at the university, including faculty forums, performances by artists, and guest speakers.

Cellular and Molecular Biology

Coordinator: Eva Sapi, Associate Professor, Ph.D., Eotvos Lorand University, Budapest, Hungary

The master of science program in cellular and molecular biology is intended for those interested in the rapidly expanding fields of biotechnology, basic science, and pharmacological research. The level of experience required for an individual to contribute in these fields is not satisfied by an undergraduate degree; therefore, individuals with advanced training are in demand.

The program, with strong emphasis on biochemistry and molecular biology techniques, provides students with the preparation needed for advanced training. The central curriculum consists of courses in biochemistry, cell biology, genomics, and molecular biology. These courses develop the student's ability to function as an independent scientist by stressing both conceptual and technical aspects of each subject.

Admission Policy

Applications for the cellular and molecular biology program may be submitted at any time; however, full-time admission to the program is granted for the Fall trimester only.

Candidates for admission to the cellular and molecular biology program are expected to have a bachelor's degree in biology, chemistry, or a related discipline. The undergraduate course work should have included general biology, advanced biology electives, general chemistry, and organic chemistry. It is also recommended that applicants have taken introductory statistics, calculus, molecular biology, and biochemistry.

Students who do not hold a bachelor's degree in an appropriate field or who lack the minimum program prerequisites may be provisionally accepted and then must complete the requirements stipulated at the beginning of the program study. Upon completion of the provisional requirements, the student's record is evaluated for full admission. In addition, provisionally accepted students may be prevented from enrolling in certain specific graduate courses until prerequisites are met, as determined by the program coordinator.

M.S., Cellular and Molecular Biology

A minimum of 38 credits of graduate work must be completed to earn the master of science degree in cellular and molecular biology. The program consists of eight required and at least four elective courses.

Students are required to participate in research. The requirement may be satisfied by completion of a research project or an internship or a thesis. Research project and internship options are intended for students who are interested in learning about academic or industrial research environments or who are already employed. The thesis option is intended for students interested in future pursuit of a doctoral degree.

Cooperative education experience may also be used for research credit, with the approval of the program coordinator.

Students who elect to write a thesis as a part of the program of study must take MB 698 and 699, Thesis I and II (6 credits). For those students a minimum of 41 credits of graduate work must be completed to earn the master of science degree in cellular and molecular biology. Thesis preparation and submission must comply with the Graduate School policy on theses as well as specific departmental requirements.

Required Courses

BI 605/M 605	Biostatistics
MB 601	Protein Biochemistry and Enzymology
MB 603	Nucleic Acid Biochemistry
MB 606	Molecular Genetics/Genomics
MB 607	Cellular Biology

Plus one of the following courses:

E 659	Writing and Speaking for Professionals
MB 608	Evaluation of Scientific Literature

Plus two of the following courses:

MB 611	Molecular Biology of Proteins with Laboratory (4 credits)
MB 613	Molecular Biology of Nucleic Acids with Laboratory (4 credits)
MB 617	Cell Culture Techniques with Laboratory (4 credits)

Research Options

MB 690	Research Project
MB 688/689	Internship I and II
MB 698/699	Thesis I and II

Electives

CH 650	Medicinal Chemistry I
CH 655	Pharmacology
MB 602	Biochemistry of Bioenergetics
MB 609	Data Analysis in the Environmental and Biological Sciences
MB 620	Bioinformatics
MB 622	Database Systems for Biological Research
MB 625	Advanced Bioinformatics
MB 633	Nutritional Genomics
MB 636	Immunology
MB 644	Cellular Development
MB 648	Cytoskeleton and Extracellular Matrix
MB 650	Oncogenes and Cytokines

MB	656	Receptor Effector Systems
MB	670	Special Topics
MB	680	Graduate Seminar
MB	695/696	Independent Study I and II

Community Psychology

Coordinator: Michael A. Morris, Professor, Ph.D., Boston College

The field of community psychology applies theories and techniques from psychology and related social sciences to the task of understanding and modifying the complex social forces that influence individual and community well-being.

Accordingly, the M.A. program in community psychology provides training in current approaches to preventing and treating psychological problems, emphasizing interventions at the level of social institutions, organizations, and groups as well as the individual. Community analysis, consultation, and crisis intervention are addressed, in addition to program development, administration, and evaluation.

Classroom study is closely integrated with supervised internships in a variety of human service organizations and community settings.

Graduates assume positions of responsibility in a broad range of human service settings, such as mental health programs, youth service bureaus, community centers, child development programs, municipal services, state agencies, health care systems, and community action programs.

Admission Policy

An undergraduate degree from an accredited institution is required. A major in psychology is preferred but not required. However, all students are expected to have at least an introductory-level understanding of psychological concepts, principles, and methods before entering the program. Students who have not had an undergraduate course in statistical methods may be required to take one before enrolling in P 608. Academic performance and relevant work/volunteer experience play a major role in admission decisions.

Applicants should submit a personal statement describing their interest in community psychology in addition to providing the materials required by the Graduate School. Applicants may also be required to submit scores from either the Miller Analogies Test or the Graduate Record Examination Aptitude Test, at the discretion of the department. Students who intend to pursue further graduate work are strongly encouraged to take the GRE early in their first year of study in the program.

Internships and Seminars

Supervised internships in a variety of settings are a major vehicle through which students in the program develop applied skills. Students plan their internship activities in collaboration with both the program coordinator and their supervisor from the field setting. Internships are provided in the areas of individual intervention, consultation, and systems intervention. Students with a year or more of appropriate full-time human service experience in a particular internship area can substitute an elective course for that internship, contingent upon the approval of the program coordinator.

Internship seminars provide a theoretical and research framework within which the development of applied skills is examined and discussed. The seminars enable students to conceptualize within a broader context the issues encountered in the field. In addition, a comprehensive project report in which students analyze and integrate their internship with relevant research and course work is required.

Thesis

Students may choose to write a thesis as part of their program of study. The thesis must demonstrate an ability to organize and present data and conclusions in a clear, original, and well-reasoned fashion. A thesis is strongly recommended for students wishing to pursue doctoral training after graduation. Thesis preparation and submission must comply with Graduate School policy as well as specific departmental requirements.

M.A., Community Psychology

The program consists of 45 credits, 24 of which compose the core curriculum completed by all students, and 12 of which constitute one of three areas of concentration. The remaining 9 credits are electives.

Required Courses

P	605	Survey of Community Psychology
P	608	Psychometrics and Statistics
P	609	Research Methods
P	610	Program Evaluation
P	612	Consultation Seminar
P	615	Consultation Fieldwork
P	611	Individual Intervention Seminar
		or
P	613	Systems Intervention Seminar
P	614	Individual Intervention Fieldwork
		or
P	616	Systems Intervention Fieldwork

Concentration (four courses)

Electives (three courses)

Concentration in Community-Clinical Services

The community-clinical services concentration prepares students for careers in clinical, mental health, and related human-service settings. Direct work with individuals is stressed, as are consultation, social problem analysis, and prevention techniques and strategies. Select four of the following courses:

P	625	Life Span Developmental Psychology
P	628	The Interview
P	629	Introduction to Psychotherapy and Counseling
P	632	Group Treatment and Family Therapy
P	636	Abnormal Psychology

Concentration in Forensic Psychology

The 12-credit forensic psychology concentration, offered jointly by the Psychology and Criminal Justice departments, prepares students for careers in the management and care of offenders in forensic settings. In addition, it is designed to enhance the knowledge and skills of professionals currently working in law enforcement, the courts, and various community-based treatment and prevention programs.

CJ	623	Mental Health Law
P	656	Abnormal Psychology in Forensic Populations
P	657	Forensic Assessment and
P	658	Forensic Treatment Models

Concentration in Program Development

The 12-credit program development concentration prepares students for careers that emphasize the administration of both traditional and non-traditional programs and services. The concentration addresses planning, development, and evaluation of innovative approaches to treatment and prevention in the public and private human service sectors as well as in business and industry.

P	619	Organizational Behavior
P	628	The Interview
PA	604	Communities and Social Change
PA	602	Public Policy Formulation and Implementation
		or
PA	649	History and Development of Health Care Institutions

Education Programs

The Education Department offers two programs of graduate study: (1) **Teacher Certification** for those seeking initial certification in the areas of elementary and secondary education in social studies, language arts (English), mathematics, science (biology, chemistry, physics, earth science, or general science), business, world languages, and music; (2) **Professional Education** for currently certified teachers seeking professional advancement. Both programs lead to the master of science in education degree. Many courses are offered at three locations: West Haven, Newington, and Mitchell College (Southeastern) in New London. These programs

represent the university's commitment to the preparation of future educators for meaningful roles in teaching the youth of the 21st century.

The Bachelor's Plus program for UNH undergraduates interested in a teaching career enables candidates to begin their teacher preparation program as undergraduates. Candidates can earn a bachelor's degree, master's degree, and Connecticut teaching certification in five years. Contact the Education Department for information.

Teacher Certification Program

Chair: Nancy Niemi, Associate Professor, Ph.D., University of Rochester

Certification Officer: Phyllis S. Gwatkin, M.S., Fordham University; C.A.G.S., St. Joseph College

Director of Student Teaching: Susanne Murphy, M.A., Yale University; M.S. and C.A.G.S., Southern Connecticut State University

Internship and Recruitment Coordinator: Nicholas Maiorino, M.A., Sixth Year Certificate, Southern Connecticut State University

Capstone and Mathematics Coordinator: John Ciochine, B.S., Southern Connecticut State University, M.S., Sixth Year Certificate, Fairfield University

Professional Education Coordinator for Southeastern Campus: Lawrence Roberts, B.A., M.A.T., Sixth Year Certificate, Sacred Heart University

The Teacher Certification program prepares educators to teach today's diverse student population. Candidates are required to enter the program with a strong academic major from their undergraduate institution. The Teacher Certification program builds on previous content knowledge while blending educational theory and practice within the context of effective pedagogical practices. Particular emphasis is placed on linking field experiences to coursework. Because teacher candidates are expected to teach diverse student populations, it is recommended that candidates participate in both urban and suburban field experiences.

Admission Policy

Candidates must hold a baccalaureate degree from an accredited institution of higher education. Candidates must have a broad range of general core academic courses as well as courses specific to the subject area and/or level of certification sought. In addition, candidates must meet the requirement for one 3-credit course in United States history, which may be credited from undergraduate course work or fulfilled in the university's graduate program by taking an elective (HS 610 Survey of United States History). All official undergraduate transcripts must be submitted for review to determine whether candidates have successfully met background requirements.

A minimum grade point average of 2.7 (equivalent to a B-) is required for admission, and only grades of C or higher are accepted. Courses with a C- are not accepted. In addition to course work and grade requirements, applicants must pass PRAXIS I or obtain an approved waiver from the Connecticut Department of Education prior to admission. Candidates must submit two letters of recommendation and an essay describing experience relevant to teaching as well as reasons for applying to the program. All prospective candidates are interviewed. Information outlining admission criteria is available from the Education Department website, www.newhaven.edu/education. Information sessions are held periodically; dates and times are posted on our website.

M.S., Education with Teacher Certification

A total of 36 credits is required for completion of the master of science degree in education. Typically, the M.S. degree can be completed in one year. In order to receive the M.S. degree in education, candidates must pass an examination in pedagogy in their appropriate certification area (elementary or secondary).

To obtain Connecticut teacher certification, candidates must also take six credits of student teaching (ED 600). Candidates should note that these six credits are taken in addition to the 36 credits required for the M.S. degree, and that student teaching credits do

not count toward the degree. Successful completion of student teaching with a grade of B- or higher is required before candidates are recommended to the Connecticut Department of Education for initial teacher certification.

Candidates begin the program by attending orientation sessions and ED 601 Introduction to Education, a one-credit course. ED 601 is offered in August for those candidates beginning their studies in September, and in December for those who begin in January. Candidates may begin the program in either the fall term or the winter term. Full-time candidates take their courses together as a cohort, fostering collegiality and professional relationships that frequently continue beyond the program's duration.

Field Experiences

Intern Candidates: A supervised internship is an option available to all candidates. Candidates, while interning, are expected to work in a school district for 3 trimesters. In return, the Connecticut school district and the university pay the student's tuition for the 36-credit master of science degree.

Capstone (Non-Intern) Candidates: Candidates who do not choose the internship option must complete 3 pre-student teaching field experiences while in the program. In the final field experience, candidates are placed in a classroom under the guidance of a teacher and university supervisor for a minimum of two weeks. The final field experience provides opportunities for observing experienced teachers, implementing selected lesson plans, and reflecting on practice.

Student Teaching: Prior to the student-teaching field experience, candidates must complete all prerequisites and professional courses with a GPA of 3.0 or higher. Secondary candidates must pass PRAXIS II before applying for student teaching. Candidates participate in a 13-week student teaching practicum under the guidance of a classroom teacher who has completed the BEST (Beginning Educator Support and Training) program, and a university supervisor. Candidates may also be required to attend student teaching seminars during this period.

Elementary Certification (Grades K–6)

Courses may change due to revised certification requirements.

The following courses (36 credits) are required for candidates seeking elementary certification (Grades K–6):

Core Courses (18 credits)

ED 601	Introduction to Education (1 credit)
ED 603	Human Growth and Development (3 credits)
ED 604	Educational Psychology (3 credits)
ED 605	Students with Special Needs (3 credits)
ED 606	History of American Education (online) (2 credits)
ED 620	Seminar in Multicultural Issues (1 credit)
ED 680	Contemporary Issues (3 credits)
ED 682	Measurement, Assessment, and Evaluation (2–3 credits)

Strategies Courses (14 credits)

ED 621E	Teaching Strategies in Mathematics (3 credits)
ED 622E	Teaching Strategies in Science (3 credits)
ED 626E	Strategies for Teaching Reading and Language Arts in Elementary Schools (3 credits)
ED 630E	Children's Literature (2 credits)
ED 636	Early Literacy (3 credits)

Internship Field Experience

ED 692I	(1 credit)
ED 693I	(1 credit)
ED 694I	(2 credits)
	or

Capstone Field Experience

ED 692C	(1 credit)
ED 693C	(1 credit)
ED 694C	(2 credits)

Degree Requirement

Candidates must pass a comprehensive examination dealing with pedagogy.

Certification Requirement

Candidates must pass two comprehensive examinations:

- PRAXIS II exams dealing with instruction
- The Connecticut Foundations of Reading Test

Secondary Certification (Grades 7–12)

Courses may change due to revised certification requirements.

The following courses (36 credits) are required for candidates seeking secondary certification (grades 7–12):

Core Courses (18 credits)

ED 601	Introduction to Education (1 credit)
ED 603	Human Growth and Development (3 credits)
ED 604	Educational Psychology (3 credits)
ED 605	Students with Special Needs (3 credits)
ED 606	History of American Education (online) (2 credits)
ED 620	Seminar in Multicultural Issues (1 credit)
ED 680	Contemporary Issues (3 credits)
ED 682	Measurement, Assessment, and Evaluation (2–3 credits)

Strategies Courses (8–9 credits)

ED 627	Reading and Writing Across the Curriculum (3 credits) (for non-language-arts majors)
	or
ED 630S	Reading and Adolescent Literature (3 credits) (for English majors)
	and
ED 642	Current Instructional Trends (2–3 credits)

Plus one of the following (depending on subject area certification):

ED 621S	Teaching Strategies in Mathematics (3 credits)
ED 622S	Teaching Strategies in Science (3 credits)
ED 623S	Teaching Strategies in Social Studies (3 credits)
ED 624	Teaching Strategies in Business (3 credits)
ED 625S	Teaching Strategies in Language Arts/Secondary School (3 credits)

Internship Field Experience

ED 692I	(1 credit)
ED 693I	(1 credit)
ED 694I	(2 credits)
	or

Capstone Field Experience

ED 692C	(1 credit)
ED 693C	(1 credit)
ED 694C	(2 credits)

Plus

Electives (6 credits)

Degree Requirement

Candidates must pass a comprehensive examination dealing with pedagogy.

Certification Requirement

Candidates must pass the PRAXIS II exam(s) in the subject content area.

Applying for State Certification

In the certification process, the university must recommend the candidate to the Connecticut State Department of Education. After candidates have successfully completed the professional courses in their program, including Student Teaching (ED 600), the certification officer verifies that candidates have met all requirements and then recommends, with department approval, candidates for certification. **The courses taken for a particular certification must be consistent with the statutory requirements of laws current at the time of application for certification rather than the regulations operating at the time of admission to the university.**

U.S. Department of Education Title II Report

Section 207 of Title II of the Higher Education Act mandates that the Education Department collect data on assessments, requirements, and standards for teacher certification and licensure as well as performance of teacher preparation programs. The law requires that these data be used to submit an annual report on the quality of teacher preparation to the U.S. Congress. The full report of annual data for the University of New Haven's performance is available from the Education Department.

II. Professional Education

Chair: Nancy Niemi, Associate Professor, Ph.D., University of Rochester

The Professional Education program, leading to a master of science in education degree, provides a curriculum for continuing professional growth. Applicants must hold a baccalaureate degree from an accredited institution of higher education and teaching certification in Connecticut or elsewhere. This program does not lead to the university's recommendation for teacher certification, but candidates holding a current Connecticut teacher certification may wish to consider designing their Professional Education program to include courses that will enable them to apply directly to the Connecticut Department of Education to add a cross-endorsement on their current teaching certificate.

Admission requirements include two letters of recommendation, official transcript(s), a valid certification license in Connecticut or elsewhere, an essay setting forth the candidate's reasons for enrolling in the program, and an interview with the coordinator of the program.

M.S., Professional Education

A total of 36 credits is required for completion of the master of science in education degree. Teachers are provided with the opportunity to take a wide variety of courses among the required and elective courses offered. Contact the Education Department for information.

Core Courses (9 credits)

ED	604	Educational Psychology
ED	612	Curriculum Design
ED	682	Measurement, Assessment, and Evaluation

Research Courses (6 credits)

ED	685	Teacher Research
ED	687	Field Project I

Approved Electives (21 credits)

Environmental Science

Coordinator: Roman N. Zajac, Professor, Ph.D., University of Connecticut

The purpose of this program is to provide graduate-level education for careers in environmental science as well as for other areas requiring knowledge of environmental principles. It is intended to meet the needs of those who wish to enter this dynamic and expanding field, those who are active environmental scientists and managers, and also those who plan to pursue graduate training beyond the master's level. An interdisciplinary program composed of courses in ecology, geology, chemistry, and legislation, it provides the advanced skills and knowledge necessary to meet the increasing demand for scientists with an environmental background. Field and laboratory work provide practical experience for students enrolled in the program, while ongoing faculty projects provide opportunities to perform research on various environmental problems and issues.

Scientists knowledgeable in environmental issues are needed by employers in the following major areas:

- government agencies, particularly in the areas of environmental protection and management
- water, sewer, and power-generation utilities
- analytic laboratories
- environmental and engineering firms
- industries in the field of pollution control
- private industry and management

- non-governmental organizations such as the United Nations, the World Bank, and conservation groups
- educational institutions such as museums and science centers

Admission Policy

Candidates for admission to the environmental science program are expected to have a bachelor's degree in the sciences with courses in biology, general chemistry, organic chemistry, and calculus. Also suggested are a course in introductory statistics and a course in physics. Students who do not hold a bachelor's degree in science or who lack the minimum program prerequisites must complete them before enrolling in certain specific graduate courses, as will be determined in consultation with the program coordinator.

It is expected that prerequisites be completed either prior to enrolling in graduate courses or within a year of admission into the program. This period can be extended only with the consent of the program coordinator. Students who must take a course in organic chemistry as a prerequisite may choose to take CH 600 Introduction to Environmental Chemistry to fulfill this requirement. It should be noted, however, that CH 600 is taken on an excess-credit basis and does not count toward fulfilling the program requirement of 42 graduate credits.

MS, Environmental Science

A minimum of 42 credits must be completed to earn the master of science in environmental Science degree. The transfer of credit earned at other institutions is permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog.

The program consists of five required core courses plus additional courses that may be taken in a specified area of concentration. Note that students who do not choose to concentrate in a particular area are required to follow a plan of study determined in consultation with the program coordinator. Required courses cover common areas in environmental science, while the electives and concentration options enable students to study in a particular area of interest or in subjects with direct application to their current professional situations.

Students may elect to write a thesis as part of the program of study. Thesis preparation and submission must comply with the Graduate School policy on theses as well as specific departmental requirements. A thesis is recommended for students who wish to pursue doctoral training after graduation and for those with specific professional interests. For students who choose the thesis option, the selection of thesis courses is determined in consultation with the program coordinator and the thesis advisor, and includes EN 698 and 699 Thesis I and II in lieu of other courses in the program.

Students should note that a number of courses in this program require weekend field trips, lab sessions, or acceptable alternatives. In addition, students should consult the program coordinator for advice on selection of appropriate courses and on assuring compliance with prerequisites.

Required Courses

CE	606	Environmental Law and Legislation
CH	601	Environmental Chemistry
EN	600	Environmental Geoscience (4 credits)
EN	601	Principles of Ecology with Laboratory (4 credits)
EN	690	Research Project*

Concentration or Approved Electives

*Students select a topic in their area of concentration.

Note: Students who select the general program rather than a concentration are required to follow a plan of study determined in consultation with the program coordinator.

Concentrations

Students may elect to pursue one of the following concentrations for the elective portion of the program. As students declare a concentration, they are assigned to the faculty advisor responsible for it, and the advisor helps the student formulate an individual program and the approved electives, which must be selected from at least two other concentration areas. Concentrations require a minimum of 25 credits.

Concentration in Environmental Ecology

Concentration Advisor: Roman N. Zajac, Professor, Ph.D., University of Connecticut

EN 602 Environmental Effects of Pollutants
EN 607 Environmental Reports and Impact Assessment
EN 609/
MB 609 Data Analysis in the Environmental and Biological Sciences
EN 615 Toxicology
Restricted Electives (two courses, from two other concentrations)

Plus two to three of the following:**

EN 603 Wetlands Ecology with Laboratory (4 credits)
EN 604 Ecology of Inland Waters
EN 605 Marine and Estuarine Ecology (4 credits)
EN 608 Landscape Ecology
EN 621 Hydrology (4 credits)
EN 650 Environmental Microbiology (4 credits)
EN 670 Selected Topics

**Chosen in consultation with the program coordinator in light of the student's academic and professional goals.

Concentration in Environmental Geoscience

Concentration Advisor: R. Laurence Davis, Professor, Ph.D., University of Rochester

EN 621 Hydrology (4 credits)
EN 622 Groundwater Geology (4 credits)
EN 632 Field Geology of the Northeast (4 credits)
or
EN 633 Selected Topics in Field Geology (1–4 credits)
Restricted Electives (two courses, from two other concentrations)

Plus two to four of the following:**

EN 617 Subsurface Assessment
EN 620 Advanced Environmental Geology (4 credits)
EN 625 Geomorphology (4 credits)
EN 626 Glacial Geology
EN 627 Soil Science
EN 670 Selected Topics

**Chosen in consultation with the program coordinator in light of the student's academic and professional goals.

Concentration in Environmental Health and Management

Concentration Advisor: Roman N. Zajac, Professor, Ph.D., University of Connecticut

EN 607 Environmental Reports and Impact Assessment
EN 615 Toxicology
EN 617 Subsurface Assessment
EN 618 Hazardous Materials Management
Restricted Electives (two courses, from two other concentrations)

Plus two to three of the following:*

CE 605 Solid Waste Management
EN 602 Environmental Effects of Pollutants
EN 610 Environmental Health
EN 612 Epidemiology
EN 613 Radioactivity and Radiation in the Environment
EN 616 Human Health and Environmental Risk Assessment
EN 670 Selected Topics
SH 608 Industrial Hygiene Practices
SH 620 Occupational Safety and Health Law

Concentration in Environmental Education

Concentration Advisor: R. Laurence Davis, Professor, Ph.D., University of Rochester

EN 632 Field Geology of the Northeast (4 credits)
EN 634 Environmental Education Instructors Clinic
ED 603 Human Growth/Development
ED 612 Curriculum Design

ED 622E Elementary Science Teaching
ED 622S Secondary Science Teaching

Plus one of the following:

EN 603 Wetlands Ecology with Laboratory (4 credits)
EN 604 Ecology of Inland Waters
EN 605 Marine and Estuarine Ecology (4 credits)

One Restricted Elective*
EN 625 Geomorphology (4 credits)
or a course in the Environmental Ecology Concentration
or other approved field experience

Plus one free elective* of any approved Environmental Science or Education Course

Concentration in Geographical Information Systems and Applications

Concentration Advisor: Daniel DePodesta, Practitioner-in-Residence, M.B.A., Quinnipiac University

EN 640 Introduction to Geographical Information Systems
EN 641 Geographical Information System Techniques and Applications I
EN 642 Geographical Information System Techniques and Applications II
EN 643 Advanced Applications of GIS
Restricted Electives (two courses, from two other concentrations)

Plus two to three of the following:*

EN 608 Landscape Ecology
EN 620 Advanced Environmental Geology (4 credits)
EN 625 Geomorphology (4 credits)
EN 670 Selected Topics

See the Table of Contents for the certificate in geographical information systems.

Human Nutrition

Coordinator: Rosa A. Mo, Lecturer, Ed.D., R.D., Columbia University

The purpose of the program leading to the master of science degree in human nutrition is to provide high-quality nutrition education at the graduate level for working adult students in the food, pharmaceutical, and allied health fields so that they can apply up-to-date and in-depth nutritional knowledge in their areas of specialization and gain a foundation for further study at the Ph.D. level. This biomedically oriented program has a solid scientific foundation with a strong focus on the role of nutrition in health and disease. Therefore, the curriculum is designed to give graduates a deep understanding of the close connections among nutrition, health, and disease as well as to provide them with the body of knowledge necessary to understand these connections and the evidence supporting them.

For the convenience of students whose work schedules and other obligations preclude attendance at evening classes, this program is offered on a weekend schedule. Classes meet monthly on the main campus ,both Saturdays and Sundays from 9 a.m. to 5 p.m.

The master of science in human nutrition program is affiliated with the Yale–New Haven Hospital Dietetic Internship.

Admission Policy

This program is most appropriate for registered dietitians and certain other licensed health professionals or for high school science teachers and others with undergraduate majors in chemistry or the biological sciences. Minimum admission requirements are a four-year baccalaureate degree from an accredited university or equivalent, with an above-average undergraduate record including successfully completed course work in introductory biochemistry or organic chemistry plus human anatomy and physiology.

M.S., Human Nutrition

Completion of a total of 33 graduate credits is required for the master of science degree in human nutrition.

Required Courses

NU 601	Nutritional Biochemistry I: Fundamentals
NU 602	Nutritional Biochemistry II: Applications
	or
NU 606	Cell and Molecular Biology of Human Nutrition
NU 603	Nutritional Physiology
NU 604	Vitamin Metabolism
NU 605	Mineral Metabolism
NU 609	Research Methodology in Nutrition
NU 610	Nutrition and Disease I
	or
NU 693	Human Nutrition Internship I
NU 611	Nutrition and Disease II
	or
NU 694	Human Nutrition Internship II
NU 612	Nutrition and Health: Contemporary Issues and Controversies
NU 613	Maternal and Child Nutrition
NU 690	Research Project

Human Nutrition Program Options

Students enrolled in the Human Nutrition graduate program may wish to complete undergraduate courses to fulfill the foundation knowledge and skills required in a Didactic Program in Dietetics (DPD) approved by the Commission on Accreditation for Dietetics Education (CADE) of the American Dietetic Association, 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995, 800.877.1600, www.eatright.org. The undergraduate Nutrition and Dietetics program encourages students to request a transcript evaluation from the program Director, Georgia Chavent, 203.932.7410, to determine which undergraduate courses are required to receive a Verification Statement. A minimum of six undergraduate courses must be taken at UNH. Students holding a verification statement may apply to a supervised practice program such as a dietetic internship. Following completion of the practice program or dietetic internship, the candidate may sit for the exam to become a registered dietitian (RD).

Industrial/Organizational Psychology

Coordinator: Stuart D. Sidle, Assistant Professor, Ph.D., DePaul University

The study and practice of industrial and organizational psychology are directed toward enhancing the effectiveness and functioning of organizations by applying psychological principles to human work behavior.

The primary goal of the program leading to the master of arts degree in industrial/organizational psychology is to provide students with the knowledge and experience necessary to improve the satisfaction and productivity of people at work.

Graduates typically perform activities in a number of areas that focus on individual, group, and organizational processes, including the following:

- Organizational change and development
- Consultation
- Motivation and morale
- Leadership and managerial development
- Conflict management
- Team/group dynamics
- Recruiting, selection, and placement
- Performance management
- Attitude and opinion measurement
- Training design and implementation
- Strategic human resource planning
- Employment law
- Job analysis and evaluation
- Job design and enrichment
- Employee assistance programs
- Compensation and benefits
- Program evaluation.

Building on a strong foundation of theory, the program emphasizes application of principles in a wide variety of work settings. The curriculum is strengthened by ongoing, active relationships with local and regional human resource and applied psychological associations. Another unique feature of the program is

the Center for Dispute Resolution (CDR), which offers mediation services to UNH students, faculty, and staff, and provides training in mediation and negotiation. Furthermore, the I/O Psychology program at UNH conforms to the standards of the Council of Applied Master's Programs in Psychology (CAMPP).

This master's degree prepares students for careers in private and public corporations, consulting firms, government agencies, and applied research institutions. Those aspiring to enter the field, practicing professionals, and those planning for graduate training beyond the master's level will find their educational needs accommodated by the flexible nature of the program.

Admission Policy

Applicants are expected to possess social and interpersonal characteristics that will support success in organizational settings. Students who give evidence of a mature interest in the application of psychological principles to organizational problems and who hold an undergraduate degree from an accredited college or university are eligible for admission.

Students who have taken the Graduate Record Examination (GRE) within the past five years are asked to report their scores to the Graduate School. In addition to the Graduate School application form, applicants are asked to complete an I/O program questionnaire and submit it directly to the Graduate School. For applicants whose native language is not English, TOEFL scores must be reported to the Graduate School. ESL certification is also welcomed.

An undergraduate major in psychology is not specifically required as a basis for consideration. However, students are expected to have at least an introductory-level understanding of psychological concepts, principles, and methods before taking courses in the master of arts in industrial/organizational psychology program.

M.A., Industrial/ Organizational Psychology

A total of 48 credits is required of candidates for the master of arts degree in industrial/organizational psychology. Candidates for this degree must complete 24 credits in the core curriculum. Another 24 credits (including concentrations, program options, and electives) are chosen after consultation with the program coordinator in light of the student's academic and professional goals. Students may not complete more than nine credits of electives until they have satisfied the core requirements. Up to nine credits of electives may be taken in other departments, such as industrial engineering, economics, management, marketing, and public administration.

Transfer Credit

The transfer of credit from other institutions is permitted subject to the Graduate School policy on transfer of credit detailed elsewhere in this catalog.

Thesis

Students may elect to write a thesis as part of the program of study. The thesis must show ability to organize materials in a clear and original manner and to present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as specific departmental requirements.

Program Options

Students have the opportunity to develop a program that meets their particular needs and interests by choosing from many elective courses and various program options. These options include a thesis, for those interested in future pursuit of a doctoral degree; an internship, for those interested in a practical introduction to an organizational environment; or a practicum, for those already employed.

Option 1 (Thesis) is intended primarily for those who are interested in continuing their education in doctoral-level programs. This option gives students the research experience necessary to be successful in pursuit of admission to and completion of a Ph.D. program.

Option 2 (Internship/Practicum) allows the student to acquire special skills by coordinating formal course work with an internship or practicum in an organizational setting. The internship gives the student with limited work experience opportunity to work in cooperating organizations or consulting firms. The practicum experience is for the student who is currently employed.

The content of the practicum or internship is established jointly by the cooperating organization, the program coordinator, and the student. A comprehensive project report is required in which the student analyzes and integrates internship/practicum experiences with relevant research and coursework.

Option 3 (Approved Electives) consists of elective courses selected under faculty advisement. The choice of electives is intended to provide the student with a broad interdisciplinary background, complementing the student's own academic training and interests. A comprehensive examination covering material from the required core psychology courses is required under this option.

Program Concentrations

Within each program option described above, students may concentrate in industrial-human resources, organizational development, or conflict management. A concentration requires 12 credits of electives, which are counted as part of the 24 credits required in the elective option (Thesis, Internship/Practicum, or Approved Electives) selected by the student. If a concentration is selected, the student must notify the program coordinator as well as the Registrar. A concentration is not required if the student's educational or career goals can best be met without this specialization.

Required Courses (24 credits)

EC	625	Industrial Relations
P	608	Psychometrics and Statistics*
P	609	Research Methods
P	619	Organizational Behavior
P	620	Industrial Psychology
P	635	Psychological Tests and Measurements in Industry
P	640	Industrial Motivation and Morale
P	645	Seminar in Industrial/ Organizational Psychology

Program option** (24 credits)

*Undergraduate preparation in statistics is prerequisite.

**Chosen in consultation with the program coordinator in light of the student's academic and professional goals.

Option 1 (Thesis)

P	698/699	Thesis I and II

Electives** (18 credits)

Option 2 (Internship/Practicum)

P	693	Organizational Internship I
P	694	Organizational Internship II
		or
P	678	Practicum I
P	679	Practicum II

Electives** (18 credits)

Option 3 (Approved Electives)

Comprehensive examination required
Electives** (24 credits)

Concentration in Industrial-Human Resources Psychology

These 12 credits count toward the elective courses for the program option selected.

P	610	Program Evaluation
P	644	Performance Appraisal Systems

Plus two of the following:

MG	645	Management of Human Resources
P	628	The Interview
P	641	Personnel Development and Training

Concentration in Organizational Development and Consultation

These 12 credits count toward the elective courses for the program option selected.

P	642	Organizational Change and Development
P	612	Consultation Seminar

Plus two of the following:

MG	663	Leadership and Team Building
P	623	Psychology of the Small Group
P	624	Experiential Self-Analytic Group
P	638	Psychology of Communication and Opinion Change
P	641	Personnel Development and Training
P	643	The Psychology of Conflict Management I

Concentration in The Psychology of Conflict Management

Advisor: Stuart D. Sidle, Assistant Professor, Ph.D., DePaul University

These 12 credits count toward the elective courses for the program option selected.

P	643	The Psychology of Conflict Management I
P	646	The Psychology of Negotiation and Mediation

Plus two of the following:

MG	667	Multicultural Issues in the Workplace
P	612	Consultation Seminar
P	623	Psychology of the Small Group
P	638	Psychology of Communication and Opinion Change
P	647	Industrial and Organizational Psychology in Global Settings
PS	655	Conflict Resolution

Graduate Certificates

The College of Arts and Sciences offers the following graduate certificates designed as options for persons having a baccalaureate degree, or a master's degree, who want to enroll in a part-time, short, coherent course of study at the graduate level. Those who may not be ready to commit to a full-length graduate program, as well as those who already hold a graduate degree but want to pursue additional work in the same or another field, may find that a certificate provides the perfect alternative.

Students applying to the Graduate School to enter a certificate program must complete the Graduate School application form and submit official transcripts showing completion of the undergraduate/baccalaureate degree and two letters of recommendation.

See the Table of Contents for the Academic Policies section of the catalog to find a complete description of the options, regulations, and requirements for study and completion of a graduate certificate.

Applications of Psychology Certificate

Advisor: Michael A. Morris, Professor, Ph.D., Boston College

The certificate in applications of psychology is designed to assist professionals who wish to acquire specific skills in areas dealing with human services or personnel functions. Study can be tailored to the needs of those whose degree is in a nonpsychological field or of those with a degree in psychology who wish to broaden their skills to a new area of psychology. Courses are selected depending upon the student's career objectives and academic preparation. The courses may be from the following list, but other courses, independent study, or special topics courses may be chosen where appropriate.

Four of the following courses (12 credits):

P	610	Program Evaluation
P	623	Psychology of the Small Group
P	625	Life Span Developmental Psychology
P	628	The Interview
P	629	Introduction to Psychotherapy and Counseling
P	632	Group Treatment and Family Therapy
P	636	Abnormal Psychology
P	638	Psychology of Communication and Opinion Change

P	641	Personnel Development and Training
P	642	Organizational Change and Development

Bioinformatics Certificate

Advisor: Anthony Melillo, Practitioner-in-Residence, M.S., University of New Haven

This certificate program provides a practical, "hands-on" approach to computer applications in molecular biology and focuses on the major issues concerning representation and analysis of biological sequence and structural information. With a strong foundation in computer science and molecular biology, students will acquire a background in generating, analyzing, and interpreting biological data, as well as the ability to apply such knowledge in biotechnology and medicine. The curriculum is designed to accommodate two convergent audiences: 1) molecular biology students with limited experience in computer systems who wish to upgrade their skills and knowledge in the field of bioinformatics, and 2) computer science students with computational or mathematical skills who wish to learn how to apply those skills to real biological problems.

The curriculum for this certificate includes five courses (15 credits), which combine computer science, molecular genetics, and bioinformatics. Prerequisites for the certificate include undergraduate molecular biology or biochemistry and college algebra.

Required courses:

CS	622	Database Systems or MB 622 Database Systems for Biological Research
MB	606	Molecular Genetics/Genomics
MB	620	Bioinformatics
MB	625	Advanced Bioinformatics

Plus one of the following:

CS	604	Introduction to Programming/C
CS	610	Intermediate Programming/C

Forensic Psychology Certificate

Advisor: James J. Cassidy, Associate Professor, Ph.D., Hahnemann University; J.D., Villanova School of Law

This certificate program, offered by the Psychology and Criminal Justice departments, is a 12-credit concentrated program of study designed to prepare individuals who will be responsible for the management and care of offenders in forensic settings. In addition, it is designed to enhance the knowledge and skills of professionals currently working in law enforcement, courts, corrections, or mental health settings. It is also intended to enhance the knowledge base of students in the M.A. Community Psychology and M.S. Criminal Justice programs. Prerequisites for the certificate are CJ 601 and CJ 605 or equivalent.

CJ 623	Mental Health Law
P 656/CJ 646	Abnormal Psychology in Forensic Populations and Outcome Evaluation
P 657/CJ 647	Forensic Assessment
P 658/CJ 648	Forensic Treatment Models

Geographical Information Systems Certificate

Advisor: Daniel DePodesta, Practitioner-in-Residence, M.B.A., Quinnipiac University

The certificate in geographical information systems (GIS) provides professional training in the technology and application of computerized cartography and spatially referenced databases. GIS is an increasingly important technology in environmental sciences, urban and regional planning and management, marketing, criminal justice, communications, and energy and natural resource protection. course work provides knowledge of basic and advanced GIS techniques, developing procedures and databases for specific applications, as well as technologies and analyses supporting GIS. This 12-credit program is flexible in order to accommodate both students new to GIS and those who already have some experience with this technology.

Students entering this program are required to have a working knowledge of personal computers.

EN	640	Introduction to Geographical Information Systems
EN	641	Geographical Information System Techniques and Applications I
EN	642	Geographical Information System Techniques and Applications II
EN	643	Application of GIS in Environmental Science
		or
EN	690	Research Project

Students having previous GIS experience may substitute, with the advisor's approval, other courses for EN 640 and/or EN 641. Substitutions may include, but are not limited to, the following:

CJ	612	Criminal Justice Management
EN	600	Environmental Geoscience
EN	608	Landscape Ecology
EN	620	Advanced Environmental Geology (4 credits)
EN	690	Research Project
EN	695	Independent Study I
MK	609	Marketing

International Relations Certificate

Advisor: Natalie J. Ferringer, Professor, Ph.D., University of Virginia

This certificate introduces students to elements of international life relevant to the growth of a global political-economic system. The four courses (12 credits) provide increased knowledge and awareness in the area of international relations for corporate executives, teachers, and professionals. Factors such as power, diplomacy, law, trade, monetary affairs, multinational corporations, investment, aid, and differing cultural and geographical characteristics are examined.

PS	606	Advanced International Relations
PS	641	The Politics of the World Economy

Plus two of the following:

HS	607	World History in the Twentieth Century
HS	670	Selected Topics
HS	695	Independent Study
IB	643	International Business
PS	603	International Law
PS	604	Human Rights and the Law
PS	625	Transnational Legal Structures
PS	628	Change and Government
PS	645	Government and the Industrial Sector
PS	670	Selected Topics
PS	695	Independent Study

Legal Studies Certificate

Advisor: Natalie J. Ferringer, Professor, Ph.D., University of Virginia

This certificate provides a background in and orientation to constitutional and legal issues in contemporary American and global society by exploring basic constitutional principles and the levels at which legal conflicts may arise. Students are introduced to basic principles and practices in the American legal system, including elements that pertain to international activity, and learn to recognize areas of potential legal conflict at all levels of the system—legislative, judicial, administrative, and regulatory. The programconsists of four courses (12 credits).

PS	601	Constitutional Law
PS	610	Legal Methods I
PS	655	Conflict Resolution

Plus one of the following:

PS	602	Civil Liberties and Rights
PS	603	International Law
PS	604	Human Rights and the Law
PS	605	Criminal Law
PS	608	The Legislative Process
PS	612	Contracts, Torts, and the Practice of Law
PS	616	Urban Government
PS	617	Law, Science, and Ethics
PS	625	Transnational Legal Structures
PS	626	Decision Making in the Political Process
PS	628	Change and Government
PS	633	The Political Process and the Aged
PS	635	Law and Public Health
PS	640	Law and Education
PS	645	Government and the Industrial Sector
PS	670	Selected Topics
PS	695	Independent Study

Psychology of Conflict Management Certificate

Advisor: Stuart D. Sidle, Assistant Professor, Ph.D., DePaul University

This certificate is designed for professionals who wish to develop skills in communication, negotiation, and mediation. Students will learn theoretical models of conflict escalation and resolution in addition to receiving training in basic skills of communication, negotiation, and mediation. Skills development enables students to resolve both personal and professional conflicts more effectively, as well as to help build the tools necessary for those interested in becoming mediators or organizational consultants specializing in conflict management. The program consists of four courses (12 credits).

P	643	The Psychology of Conflict Management I
P	646	The Psychology of Negotiation and Mediation

Plus two of the following:

MG	667	Multicultural Issues in the Workplace
P	612	Consultation Seminar
P	623	Psychology of the Small Group
P	638	Psychology of Communication and Opinion Change
P	647	Industrial and Organizational Psychology in Global Settings
P	655	Conflict Resolution

Telecommunication Management Certificate

Advisor: Steven A. Raucher, Ph.D., J.D., Wayne State University/Bridgeport School of Law at Quinnipiac College

This certificate, consisting of four courses (12 credits), prepares telecommunication managers to deal with current problems and methods of analysis pertinent to this fast-changing field and to end users, suppliers, and common carriers of telecommunication services and facilities.

CO	640	Communication Technologies*
CO	641	Competition and Regulation in Telecommunication
CO	642	Management of Telecommunication Organizations
CO	643	Telecommunication Policy and Strategy

*Students who have had the equivalent of CO 640, through either work experience or educational courses given by a common carrier, may substitute another course with the consent of the advisor.

COLLEGE OF BUSINESS

Richard Highfield, Ph.D., Dean
Ben Judd, Ph.D., Associate Dean

The primary mission of the College of Business is to provide high-quality, career-oriented education to students of varied economic and cultural backgrounds, experiences, and academic preparation. We seek to do so through comprehensive programs designed to accommodate a full-time undergraduate and a substantial part-time evening student body and by engaging in teaching, research, and consulting involving both the development and the communication of knowledge. It is the vision of the school to be a regional leader in providing career-oriented, contemporary business education.

As the business environment becomes more complex, the College of Business provides contemporary educational experiences of high quality in order to prepare students to face the challenges of a dynamic world and to meet their responsibilities within a global society. To achieve these goals, we provide career-oriented programs, employing current knowledge and techniques presented in a manner appropriate to the diverse backgrounds and experiences of our graduate students.

The College of Business is divided into five academic departments: the Departments of Accounting; Economics and Finance; Management, Marketing, and Quantitative Analysis; Public Management; and Sports/Hospitality and Tourism Management

Through the Graduate School, the College of Business offers an M.B.A. program, an Executive M.B.A. program, and master's degree programs in a number of other business fields. A master's in public administration (M.P.A.) as well as two dual degrees, M.B.A./M.P.A. and M.B.A./M.S. Industrial Engineering, are also available. Master of science degrees are offered in health care administration, labor relations, management of sports industries, and taxation. In addition, more than a dozen graduate certificates are available for students who seek a short graduate curriculum concentrated in a specific business area.

At the undergraduate level, the College of Business offers associate and bachelor's degree programs in the departments of Accounting, Economics and Finance, Marketing, Management, Sports Management, and Public Administration.

BUSINESS PROGRAMS

These programs are within the scope of included programs for AACSB candidacy and accreditation review.

Master of Business Administration (M.B.A.)

Director MBA: Ben Judd, Ph.D., University of Texas at Arlington

Academic Advisor: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

The M.B.A. curriculum prepares managers for today's increasingly complex global and multidimensional work environment. It includes a strong focus on leadership, teamwork, and integrative management activities. The program offers flexibility, providing choices within the advanced courses and a variety of functional concentrations with a broad selection of courses offered each trimester. In addition to this M.B.A. program, the university offers two M.B.A. dual degree programs: one combined with the master's program in public administration (M.B.A./M.P.A.) and one combined with the master's program in industrial engineering (M.B.A./M.S.I.E.).

Students with a recent degree in business may be able to complete the program with as few as 30–36 graduate credits, while other students may require the maximum 48–54 credits. Because the Graduate School operates on a trimester calendar with three full-

length terms each year plus an abbreviated summer session, full-time students may complete their studies in 12 to 22 months.

Admission Policy

Admission to the graduate business programs at the University of New Haven is competitive. Candidates are evaluated carefully on previous academic and professional success as well as on their potential for leadership in business, nonprofit, and other careers. Candidates for admission to graduate programs are required to hold a four-year baccalaureate degree (or the equivalent) from an accredited institution. International students must hold a degree that is acceptable as an alternative to a four year bachelor's degree program in the United States. An undergraduate degree in business is not a requirement; qualified students from all backgrounds are encouraged to apply. Admission decisions are based on a "portfolio" approach that includes review of the combination of a student's undergraduate and/or graduate academic performance, professional and/or business experience, standardized test scores, and two letters of recommendation. Applicants are encouraged to submit GMAT (or GRE) scores as part of their application.* Note: Applicants to the Emerging Leaders cohorts of the M.B.A. program should also possess a minimum of two years of post-collegiate professional, administrative, or business experience.

Required materials for admission are as follows:

- Completed application
- Official transcript(s)
- Two letters of recommendation
- Test scores*
- Résumé

Applicants may submit an essay or personal statement to provide additional information to the admissions committee or to explain any unusual circumstances.

The test score requirement can be satisfied by submission of GMAT scores, or scores from the general test administered through the Graduate Record Exam (GRE) program, or submission of evidence of current licensure as a certified public accountant, attorney, medical doctor or similar credential.

For Academic Year 2009–2010 admission, the test score requirement is waived if the applicant has a graduate degree from an accredited institution or an undergraduate GPA of 2.7 or above. Otherwise, a test score (GMAT or alternative) is required for admission.

For Academic Year 2010–11 all applicants must submit GMAT scores or an acceptable alternative to complete the program. Applicants with all other required admission material except the test score can be admitted into the program, but cannot progress past the fourth course in the program (12 credits) until a test score or acceptable alternative is submitted. Students with a minimum of five years of continuous post-collegiate professional, administrative, or business experience may apply for a waiver of the test score requirement. Waivers must be granted prior to admission, and require a personal interview plus the other required admission application materials prior to any action.

Curriculum

The M.B.A. curriculum is focused primarily on advanced topics Students without previous studies in business will complete up to 18 credits in introductory core courses before proceeding to the 30–36 credits of advanced courses and electives.

For advanced electives, students may choose four courses from a variety of alternatives or they may select a concentration from six different areas, ranging from accounting to sports management.

Students begin their studies with six required core courses. Any of these six core courses may be waived on the basis of the student's undergraduate course work or previous graduate courses, if taken at a regionally accredited institution within the last seven years. Waiver guidelines are outlined on the following pages.

After satisfying the prerequisites, students proceed to the next level in the program: the six advanced courses plus the four elective, or concentration, courses. No waivers are permitted for the 30–36 credits of advanced courses plus electives; however, transfer credit toward advanced courses and/or electives may be granted for graduate courses with a grade of B (3.0) or better if taken within the last four years at a regionally accredited institution, subject to the trans-

fer policies of the Graduate School. After admission, any graduate courses taken for transfer must have approval with a signed Coordinated Course Form.

Completion of the elective portion of the M.B.A. program may be accomplished by taking graduate courses offered through the various departments or programs of the university, or by choosing a concentration in a specific area of study. Students should select courses that will enhance their career objectives. Concentrations allow students to develop specialized skills in a particular field, and they are described later in this section. Students taking non-business elective courses must contact the M.B.A. program director for approval and seek academic advice from the graduate program coordinator of the non-business department.

In appropriate cases having special approval, a student may elect to write a thesis. Candidates for the M.B.A. who elect to write a thesis must register for a minimum of six thesis credits in the appropriate business department and substitute the six credits of Thesis I and II for two elective courses in the program. The thesis must show ability to organize material in a clear and original manner and must present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as specific departmental requirements.

Core Courses (18 credits; waivable)

A	620	Financial Accounting for Managers
EC	601	Macroeconomics and Microeconomics
FI	601	Financial Management
QA	604	Probability and Statistics
MG	637	Management Process
MK	609	Marketing

Advanced Courses (18 credits; not waivable)

A	621	Managerial Accounting
IB	644	Managing in Global Markets
FI	602	Financial Strategy and Valuation
MG	645	Managing People at Work
EC	629	Business and Society
MG	669	Strategic Management

Electives or Concentration (12–18 credits)

Note: Accounting concentration requires 51 credits; Finance concentration–Certified Financial Analyst Track requires 51 credits.

Waiver Policy

Any of the six required core courses may be waived on the basis of appropriate undergraduate or graduate courses taken within the last seven years at a regionally accredited institution. Waivers are considered at the time of admission; waivers based on a B (3.0) or better in the appropriate courses are granted. Students who seek transfer credit must submit a written request (with a course syllabus, preferably, or course description of the previously completed course work) to the M.B.A. director during the first semester of attendance. Normally, waivers are decided within the first semester of study. Only courses with grades of B or better may be used in meeting waiver guidelines for required courses. Only required core courses may be waived.

A course that has been waived may not be taken for or used for elective credits. No tuition refund or cancellation is issued for courses taken and subsequently waived.

Waiver Guidelines

The minimum course requirements or waivers are as follows (courses must have been taken within the last seven years):

A 620:	One course the equivalent of A 220 Intermediate Accounting I
EC 601:	One course in macroeconomics and one course in microeconomics
FI 601:	One upper-division course in corporate finance
MG 637:	One upper-division course in management or organizational behavior
MK 609:	One upper-division course in marketing
QA 604:	Two courses in statistics, or one course in statistics and one course in quantitative business analysis.

Concentrations

Within the M.B.A. program students may use the elective credits to concentrate their studies in a specific area. It is recommended, but not required, that concentrations be indicated on the application for admission to the M.B.A. program, or as soon as possible thereafter.

The M.B.A. concentrations and their course requirements are presented on the following pages. Concentrations consist of at least 12 credits. In certain circumstances, students may be allowed to substitute other appropriate courses for those listed as part of the concentration. Any substitution for a listed concentration course must be approved in writing by the student's concentration advisor prior to enrollment in the course.

Selection of a concentration is optional; students may find that a variety of courses from several areas is more useful for their career training and interests. If they do pursue a concentration, they are encouraged to designate it as early as possible in order to plan the sequencing of courses for the concentration and to receive appropriate advisement from the concentration advisors listed below. Most courses in a concentration may be attempted as soon as prerequisites have been satisfied. Delaying start of the concentration may cause key courses to be missed on the annual rotation. Because accounting preparation often involves state or other coverage requirements, early consultation with an advisor is strongly recommended.

Concentration in Accounting

Concentration Advisor: Robert E. Wnek, Professor, B.S.B.A., Villanova University; J.D., Widener University School of Law; L.L.M., Boston University School of Law; CPA

The concentration in accounting is recommended for those MBA students who desire an accounting specialization. Five courses (15 credits) are required.

A	630	Topics in Corporate Financial Reporting*
A	654	Financial Statement Reporting and Analysis
A	652	Auditing and Assurance Services Seminar
A	604	Taxation of Business Entities

Plus any Accounting Elective

*Students who have had two intermediate accounting undergraduate courses will substitute an accounting taxation elective for A 630.

Fifth Year CPA Exam Track

The fifth year CPA exam track is intended for those students desiring to complete the 150-hour academic credit requirement to qualify to take the CPA exam. Students should consult with their advisor concerning their specific course needs to qualify, in light of academic course completions.

Students who have successfully completed six credits of intermediate accounting with a B average may substitute an accounting or taxation course.

For students who have an undergraduate accounting degree or the equivalent of an accounting minor, we offer the fifth year CPA exam track, consisting of four courses (12 credits).

A	652	Auditing and Assurance Services Seminar

Any three Accounting or Taxation Electives

One accounting or taxation elective to be substituted for A 621 Managerial Accounting.

Concentration in Business Policy and Strategic Leadership

Concentration Advisor: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

The concentration in business policy and strategic leadership prepares managers to deal with the increasing emphasis given by companies to the development and implementation of innovative global business strategies. The program focuses on strategic concepts and processes and relates them to general management and functional supervision. A grounding in formulation of business policy and strategy for both internal growth and growth by mergers and acquisitions is provided. Four courses (12 credits) are required.

MG 663	Leadership and Team Building
MG 664	Organizational Effectiveness

Plus two of the following:

MG 650	Entrepreneurship
MG 655	Corporate Governance and Business Strategy
MG 656	Integrating the Enterprise
MG 662	Organizational Theory

P	641	Personnel Development and Training
P	642	Organizational Change and Development
P	647	Industrial and Organizational Psychology in Global Settings

Concentration in Finance

Concentration Advisor: C. Wentworth Boynton, Associate Professor, Finance
M.B.A., Ph.D., University of Rhode Island

The goal of the finance concentration is to provide students with advanced study in financial services and corporate finance. The concentration emphasizes the understanding and application of concepts from finance that will be useful in future career growth. Five courses (15 credits) are required.

FI	610	Capital Market Theory
FI	611	Equity Market Valuation and Analysis
FI	620	Capital Markets and the Valuation of Fixed Income Securities

Plus two of the following:

FI	605	Data Evaluation and Modeling
FI	625	Advanced Capital Market Issues
FI	630	Corporate Financial Analysis and Applications
FI	632	International Financial Management

Optional Track for Prospective Chartered Financial Analyst (CFA) Candidates Exam Track

The optional CFA track is designed for students interested in sitting for the CFA exams. The CFA track gives students the content material covered in the CFA Level One exam. The CFA designation is highly desirable for anyone who wishes to be competitive when pursuing positions as analysts in the financial services industry.

Students planning to pursue the CFA track take the following six courses (18 credits):

FI	605	Data Evaluation and Modeling
FI	610	Capital Market Theory
FI	611	Equity Market Valuation and Analysis
FI	620	Capital Markets and the Valuation of Fixed Income Securities
FI	625	Advanced Capital Market Issues
A	654	Financial Statements: Reporting and Analysis

Concentration in Global Marketing

Concentration Advisor: Ben B. Judd, Professor, Ph.D., University of Texas at Arlington

This concentration is designed to prepare managers to deal with the latest methods of analysis related to global marketing. These include basic techniques and skills, such as adapting to new political and cultural environments, which are not normally covered by traditional courses. It is strongly recommended that students contact the global marketing advisor as early as possible to program the appropriate sequence of courses. Five courses (15 credits) are required.

MK	651	International Marketing
MK	639	Marketing Research and Information Systems

One International Business Course

FI	632	International Financial Management

or

IB Elective

One Marketing Course

MK	616	Buyer Behavior

or

Marketing Elective

One Capstone Course

MK	643	Product Management

or

MK	641	Marketing Management

Concentration in Human Resource Management

Concentration Advisor: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

This concentration is designed for the human resource professional or the individual in another field who aspires to work in human resources. It provides an overview of subfunctions (such as

training, labor relations, and compensation) in greater depth.

Students are provided with real-world skills by the use of industry experts as adjuncts and by the introduction of unique courses such as employment law, benefits administration, finance for human resource managers, and special topics that provide practical and experiential learning. Four of the following courses (12 credits) are required.

MG 627	Human Resource and Financial Decision-Making
MG 663	Leadership and Team Building
MG 665	Compensation Administration
MG 667	Multicultural Issues in the Workplace
MG 671	Employment Law
P 641	Personnel Development and Training
P 642	Organizational Change and Development
P 644	Performance Appraisal System

Concentration in Sports Management

Concentration Advisor: Gil B. Fried, Professor, J.D., Ohio State University

As sports have grown as an industry, the need for sports managers with specialized business skills and training has increased. This concentration is for students who would like to pursue careers in the sports industry as well as for those who already work in the industry who are seeking career advancement. The focus of the program is on business applications in the key areas of facility management, sports finance, and collegiate athletic administration. Four courses (12 credits) are required.

MG 610	The Sports Industry

Plus three of the following:

CO 632	Contemporary Public Relations Issues
EC 687	Collective Bargaining
MG 611	Sport Industry Marketing, Promotion, and Public Relations
MG 612	Sports Law
MG 613	Sports Facility Management
MG 617	Applied Fiscal Management for Sports and Facility Managers
MG 618	College Sports Administration
MG 694	Internship
PS 612	Contracts, Torts, and the Practice of Law
THM 920	Strategies for Event Planning

See Table of Contents for the M.S. in Management of Sports Industries and the certificate in management of sports industries.

Master of Business Administration Cohort Option for Emerging Leaders

Director: Linda Carlone, B.A., M.S., University of New Haven

The emerging leaders cohorts of the M.B.A. program are designed for students with two or more years of business or professional experience who desire an accelerated part-time M.B.A. education. In less than two years a cohort of 15 to 25 M.B.A. students can complete an M.B.A. degree that develops the skills, knowledge, and values that today's manager must possess to be successful. The M.B.A. curriculum is presented in modules that include core and advanced courses taken in five-week increments. Each course is a building block for the next. The same group of students remains together for the entire seminar-style M.B.A. program. Courses are held on Saturdays or weekdays. Classes break for major holidays and for 5 to 6 weeks in the summer. Classes meet in Waterbury, New London, and Shelton.

Admission Policy

Candidates for admission to the emerging leaders cohorts of the M.B.A. program have the same requirements as for the regular M.B.A. program, which were listed above. In addition, applicants to the emerging leaders cohorts should possess a minimum of two years of post-collegiate professional, administrative or business experience.

Curriculum

The emerging leaders curriculum is a cohort-style version of the M.B.A. curriculum described above, with the same group of students remaining together throughout the program in a collaborative learning environment. No course waivers or transfer credits are granted for students in the emerging leaders cohorts. Students begin their studies with 18 credits of core courses followed by 30 credits of advanced courses, for a total of 48 credits.

Modules

CO 620	Applied Communications
EC 601	Macroeconomics and Microeconomics
MK 609	Marketing
QA 604	Probability and Statistics
MG 637	Management Process
A 620	Financial Accounting
LA 674	Business Law
MG 645	Managing People at Work
FI 601	Financial Management
MK 643	Product Management
FI 602	Financial Strategy and Valuation
IB 644	Managing the Global Economy
A 621	Managerial Accounting
EC 629	Business and Society
MG 669	Strategic Management
MG 686	Global Business Simulation

For more information, please contact Linda Carlone, Director of Cohort M.B.A. Programs, 203.932.7433 or lcarlone@newhaven.edu.

Executive Master of Business Administration (Executive M.B.A.)

Director: Linda Carlone, B.A., M.S., University of New Haven

The executive master of business administration is a fully accredited, graduate-level degree program designed for middle- and upper-level professionals who have meaningful managerial responsibility. Applicants are required to hold a baccalaureate degree from an accredited institution. The program provides the opportunity to earn an M.B.A. degree, the quality standard in business education, in two years without career interruption.

The program is uniquely scheduled so that working professionals can participate with maximum convenience for themselves, their families, and their companies. Each class progresses through the program as a group, thus providing an opportunity for a continuing exchange of ideas and information. Individual participation is emphasized through class discussions and interaction and cooperation with other professionals in the class. The program fosters a direct connection between what is learned in class and what is applied in business. Classes meet one afternoon per week for six hours. The university also offers a Saturday class beginning every two years. The program is convenient, enjoyable, and personalized.

Generally, no transfer credit is accepted for admission to the Executive M.B.A. program. Admission is by a special application available from the program director and the requirements parallel those outlined above for the M.B.A. program. No GMAT is required because it is expected that applicants will have the administrative, professional, or business experience required for a waiver of the normal test score requirement.

Prospective candidates are encouraged to apply as early as possible. New classes begin in September and February of each year. The admission procedure includes a screening interview with the director and review of the applicant's credentials by the Faculty Selection Committee. Each candidate is considered on the basis of the special application form, official transcripts from all undergraduate and graduate schools attended, two business-related letters of recommendation, and a letter of organizational support.

The program invites both individual and employer-sponsored applications. Information and application forms are available from the Office of the Executive M.B.A. Director, 203.932.7433, or lcarlone@newhaven.edu.

Program Requirements

The program consists of 19 modules, scheduled into two academic calendar years, plus either a master's-level research paper or a domestic or international seminar. Classes meet from 2:30 to 8:30 p.m. one weekday each week in designated conference facilities. Each module is five sessions in length and has the value of 3 credits, except for the two-day 2-credit Communication Process module, for a total of 56 credits. Participants must be prepared to attend all classes, except for emergencies. Students must also be prepared to devote significant additional time for class preparation and reading assignments.

Modules

First Year

EXID903	The Communication Process (2 credits)
EXID 915	Quantitative Decision Making
EXID 918	Managerial Economics
EXID 912	Financial Accounting
EXID 921	Executive Management and Leadership
EXID 924	Financial Management I
EXID 927	Financial Management II
EXID 942	Managerial Accounting
EXID 930	Marketing Practice
EXID 998	Marketplace–Business Simulation
EXID 954	Organizational Development

Second Year

EXID 951	Marketing Management
EXID 933	Managing the Global Marketplace
EXID 939	Operations Management
EXID 960	Information Management
EXID 948	Business Law
EXID 909	Business and Government Relations
EXID 999	Special Research Topics or
EXID 997	The Washington Campus—How Washington Works/International Seminar
EXID 957	Corporate Policy and Strategy

Management of Sports Industries

Coordinator: Gil B. Fried, Professor, Management, J.D., Ohio State University

The main objective of the master's degree program in management of sports industries is to provide the advanced knowledge and skills necessary for successful careers in the business of sports. This master's program is the first of its kind offered in Connecticut and one of only a few such programs offered by schools of business across the nation. Our focus is to prepare students for careers in a wide variety of sport-related businesses and/or facility management. Such career choices might include

- collegiate athletic administration
- sports marketing
- sports finance
- personnel management
- recreation management
- major and minor league sports
- facility management
- space allocation and event booking
- construction and renovation
- facility maintenance and safety
- sales and box office management

These career choices are often identified through an aggressive internship program with numerous professional teams/leagues, college athletic departments, sports organizations, and organizations such as ESPN, MLS, MLB and WWE.

Admission Policy

Candidates for admission must meet the same graduate business program admissions requirements outlined for the M.B.A. program. An undergraduate degree in business is not a requirement; qualified students from all backgrounds are encouraged to submit applications. An admission decision is based on a combination of a student's undergraduate and/or graduate academic performance, professional experi-

ence, letters of recommendation, and test scores, when applicable. An interview may be arranged at the request of the applicant.

For detailed information, please contact the director of the Management of Sports Industries programs.

M.S., Management of Sports Industries

A total of 36 credits is required for completion of the master of science degree in management of sports industries. The program consists of four business core courses, four sports/facility management core courses, and four sports management elective courses or four facility management concentration courses.

Business Core (12 credits)

The following required foundation business courses may be waived based on appropriate graduate or undergraduate courses completed with a grade of B or better at an accredited institution. (See waiver criteria under M.B.A. program.) If all four business courses are waived, students are required to take two additional elective courses to meet the minimum 30-credit residency requirement for the awarding of the master's degree.

A	620	Financial Accounting for Managers
EC	601	Macroeconomics and Microeconomics
MG	637	Management Process
MK	609	Marketing

Sports/Facility Management Core (12 credits)

MG	611	Sport Industry Marketing, Promotion and Public Relations
MG	612	Sports Law
MG	617	Applied Fiscal Management for Sports and Facility Managers
MG	645	Management of Human Resources

Plus Electives or Concentration (12 credits)

Electives (12 credits)

Within the elective sector of the program, students must enroll in a required internship (MG 694) designed to provide appropriate work experience in a sports/sport-related industry. Students are required to produce a comprehensive, analytic report documenting the internship experience. In special cases (requiring written approval of the program coordinator) students who already have extensive field/work experience may replace the internship with an appropriate, approved research project (MG 690).

Any of the following (totaling 12 credits)

E	659	Writing and Speaking for Professionals
IE	661	Facility Infrastructure
MG	610	The Sports Industry
MG	613	Sports Facility Management
MG	618	College Sports Administration
MG	690	Research Project
		or
MG	694	Internship (3–6 credits)
SH	602	Safety Organization and Administration
THM	920	Strategies for Event Planning

Concentration in Facility Management

The university, in conjunction with the International Association of Assembly Managers (IAAM), has developed a concentration endorsed by the IAAM, and its more than 3,800 members. The focus is on how to manage large public assembly facilities such as stadiums and arenas. Topics covered include specialties such as facility financing, community marketing, field maintenance, and crowd management.

For students who choose to complete the master's program with a concentration in facility management, the program includes the four business core courses, the four sports/facility management core courses, and four of the concentration courses listed below (12 credits), including MG 613 and a required internship (MG 694) to provide appropriate work experience in facility management. Students are required to produce a comprehensive, analytic report documenting the internship experience. In special cases (requiring written approval of the program coordinator) students who already have extensive field/work experience may replace the internship with an appropriate, approved research project (MG 690).

MG	613	Sports Facility Management
MG	690	Research Project
		or
MG	694	Internship (3–6 credits)

Plus two of the following:

E	659	Writing and Speaking for Professionals
IE	661	Facility Infrastructure
MG	610	The Sports Industry
MG	618	College Sports Administration
SH	602	Safety Organization and Administration
THM	920	Strategies for Event Planning

See the Table of Contents for the M.B.A. concentration in management of sports industries and the certificate in management of sports industries.

Taxation

Coordinator: Robert E. Wnek, Professor, B.S.B.A., Villanova University; J.D., Widener University School of Law; L.L.M., Boston University School of Law; CPA

The decision by government to utilize its taxing authority to pursue a variety of economic and social goals has led to the development of a complex body of tax law. Given the dynamic state of society's economic and social goals, the body of tax law characteristically exists in a continual state of change. The complexity of tax law is significant because of its influence on the economic decision-making process and because of its impact on the successful achievement of society's goals. Tax consequences have been and will continue to be an important financial consideration.

Admission Policy

Admission to the program is available to accountants, CPAs, attorneys, businesspeople and those holding an undergraduate degree from an accredited institution.

Candidates for admission must meet the same graduate business program admission requirements outlined above for the M.B.A. program. Admission is based primarily on an applicant's undergraduate record and work experience; however, the promise of academic success is the essential factor for admission.

M.S., Taxation

A total of 30 credits hours, including a research project, are required for the Master of Science in Taxation degree. The transfer of credit from other institutions is permitted subject to the Graduate School policy on transfer credit and residency requirements detailed elsewhere in this catalog.

Accountants and practitioners wishing to improve or update their skills, or practicing CPAs in need of continuing education credits, and others seeking to expand their tax backgrounds but uncertain about pursuing a master's in taxation, should consider pursuing a Taxation certificate as an alternative.

Required Courses

A	601	Federal Income Taxation I
A	602	Federal Income Taxation II
A	603	Tax Research and Writing
A	604	Taxation of Business Entities
A	605	Partnership and Limited Liability Company Income Taxation
A	606	Corporate Income Taxation
A	607	Qualified Plans
A	608	Taxation of Estates, Gifts, and Trusts
A	609	Tax Practice and Procedure
A	615	Research Project in Taxation

Electives

A	610	International Taxation
		or
A	611	State and Local Taxation

NON-BUSINESS PROGRAMS

These programs are not within the scope of included programs for AACSB candidacy and accreditation review.

Public Administration (M.P.A.)

Coordinator: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

The general purpose of the master of public administration degree is the training of men and women at the graduate level for public service careers. Specifically, the program strives to:

- equip students with modern analytic and quantitative tools of decision making and their application to complex problems of government and nonprofit organizations;
- expose students to the wide range of administrative and managerial problems and responsibilities in the public sector; and
- increase the student's knowledge and skills in the particular management functions of budgeting, planning, public policy formulation, public finance, public personnel administration, and collective bargaining.

The Department of Public Management in the College of Business hosts a chapter of the Public Administration Honorary Society (Pi Alpha Alpha). The National Association of Schools of Public Affairs and Administration awarded the chapter to the university in 2003 after a rigorous examination of the quality of UNH's Public Administration program.

Required Courses

The program requires 42 graduate credits for the M.P.A. degree.

EC	601	Macroeconomics and Microeconomics
PA	601	Principles of Public Administration
PA	602	Public Policy Formulation and Implementation
PA	604	Communities and Social Change
PA	611	Research Methods in Public Administration
PA	620	Personnel Administration and Collective Bargaining in the Public Sector
PA	625	Administrative Behavior
PA	632	Public Finance and Budgeting
PA	690	Research Seminar

Electives or Concentration (five courses)

Concentration in City Management

The courses in this concentration enable local government practitioners to develop and make better use of their personnel and budgetary resources. This ability is especially important today, as the federal government is reducing its fiscal support of local governments.

Students choosing the concentration in city management take the required core curriculum of nine courses and follow the city management concentration in lieu of their five elective courses.

PA	630	Fiscal Management for Local Government
PA	661	Problems of Metropolitan Areas
PS	616	Urban Government

Plus two of the following:

E	659	Writing and Speaking for Professionals
EC	665	Urban and Regional Economic Development
P	610	Program Evaluation
PA	670	Selected Topics
SO	610	Urban Sociology

Concentration in Community-Clinical Services

This concentration prepares students for administrative careers in clinical, mental health, and related human service settings. The administration of programs within the contexts of social and community environments is stressed. Students will learn how to

deliver services effectively within these turbulent environments.

Students choosing the community-clinical services concentration take the core curriculum of nine courses and the four courses in the concentration plus one elective course.

P	605	Survey of Community Psychology
P	629	Introduction to Psychotherapy and Counseling
P	632	Group Treatment and Family Therapy

Plus one of the following:

MG	640	Management of Health Care Organizations
MG	663	Leadership and Team Building
MG	664	Organizational Effectiveness

Plus one additional elective

Concentration in Health Care Management

This concentration is designed for those currently in health care management or those who anticipate a career in the field. Courses provide students with the conceptual and practical skills necessary for management of a health care organization.

Students choosing the health care concentration will take the core curriculum of nine courses and follow the 15-credit health care concentration in lieu of the five elective courses.

MG	640	Management of Health Care Organizations
PA	641	Financial Management of Health Care Organizations
PS	635	Law and Public Health

Plus two of the following:

E	659	Writing and Speaking for Professionals
MG	630	Management Information Systems in Health Care
PA	642	Health Care Delivery Systems
PA	643	Health and Institutional Planning
PA	644	Administration of Programs and Services for the Aged
PA	645	Health Care Economics and Finance
PA	646	Organization and Management of Long-Term Care Facilities
PA	647	Alternative Health Care Delivery Systems
PA	648	Contemporary Issues in Health Care
PA	651	Health Care Ethics
PA	652	Introduction to Managed Care
PA	653	Cost Containment in Health Care
PA	657	Health Care Reimbursements
PA	659	Human Resource Planning in Health Care
PA	664	Survey of Medical Group Management
PA	670	Selected Topics

See the Table of Contents for the M.S. degree in Health Care Administration and the certificates in health care management and long-term health care.

Concentration in Long-Term Health Care

This program is approved by the Department of Health Services, State of Connecticut, as a course of study in long-term health care. Students who complete the concentration are eligible to take the state licensing examination for long-term care administration, preparing individuals for participation in this area of expanding opportunities for health care practitioners.

In the following sequence, PA 646 must be taken before or concurrently with PA 681 or PA 683; PA 682 must be taken after PA 681 and PA 646. No waivers, substitutions, or transfer credits are permitted in this concentration.

There are two options for the concentration in long-term care. Please contact the program coordinator prior to selecting an option as the State of Connecticut has different requirements for each.

Option I

This option consists of 15 concentration credits and 42 total program credits.

PA	641	Financial Management of Health Care Organizations

PA 646 Organization and Management of Long-Term Care Facilities
PA 681 Long-Term Health Care Internship I
PA 682 Long-Term Health Care Internship II
One Health Care Elective

Option II

This option consists of 18 concentration credits and 45 total program credits.

PA 641 Financial Management of Health Care Organizations
PA 646 Organization and Management of Long-Term Care Facilities
PA 683 Long-Term Health Care Internship
Two Health Care Electives
One Restricted Elective

Concentration in Personnel and Labor Relations

The concentration in personnel and labor relations is designed to meet the need for better trained personnel and labor relations specialists in the public sector. The public sector has experienced a growth in union membership but has not had a corresponding growth in the capability to deal with public sector/union relationships. The courses in this concentration provide training for public administrators in areas such as employee motivation, organizational change, and group dynamics.

Students choosing this concentration take the required core curriculum of nine courses and follow the 15-credit personnel and labor relations concentration in lieu of the five elective courses.

MG 645 Management of Human Resources, or
SH 602 Safety Organization and Administration

Plus two of the following:*

EC 625 Industrial Relations
EC 627 Economics of Labor Relations
EC 687 Collective Bargaining

Plus two of the following:**

CO 621 Managerial Communication
E 659 Writing and Speaking for Professionals
MG 664 Organizational Effectiveness
P 620 Industrial Psychology
P 628 The Interview
P 632 Group Treatment and Family Therapy
P 640 Industrial Motivation and Morale
P 642 Organizational Change and Development
P 643 The Psychology of Conflict Management I
P 646 The Psychology of Conflict Management II

*Prerequisite for this group: EC 601 Macroeconomics and Microeconomics or permission of the M.P.A. coordinator.

**Prerequisite for this group: PA 625 Administrative Behavior or permission of the M.P.A. coordinator.

Public Administration Dual Degree Program (M.B.A./M.P.A.)

Coordinator: Charles N. Coleman,
Assistant Professor of Management,
M.P.A., West Virginia University

The M.B.A./M.P.A. dual degree program is designed for those whose interests or career objectives are focused on both the public and private sectors of the economy. The program broadly stresses the use of management skills and analytic techniques applied to business, industrial, governmental, and not-for-profit organizations.

M.B.A./M.P.A. Dual Degree

The M.B.A./M.P.A. program consists of 75 credits. Up to 15 credits may be waived on the basis of undergraduate course work, leaving a minimum requirement of 60 credits. Waivers must be approved in writing by the appropriate department and are conditional upon subsequent academic performance.

Graduate credit may be transferred from other accredited institutions subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog. In all cases, the residency requirement

for the two degrees shall be 60 credits completed at the University of New Haven. Within these 60 credits, a minimum of 21 must be earned in business courses and a minimum of 21 in public administration courses.

Project/Thesis Requirement

Students choose one of two alternatives for completion of the final six credits of course work in the M.B.A./M.P.A. dual degree curriculum. Most students take the two capstone/research project courses PA 690 Research Seminar and MG 669 Strategic Management. Alternatively, students may elect to take the two-course, six-credit thesis option (Thesis I and II). If the thesis option is selected, the thesis must show ability to organize material in a clear and original manner and to present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as specific department requirements.

Business Core Courses (waivable)*

A	620	Financial Accounting for Managers
EC	601	Macroeconomics and Microeconomics
FI	601	Financial Management
MG	637	Management Process
MK	609	Marketing
QA	604	Probability and Statistics

Advanced Business Courses (not waivable)

A	621	Managerial Accounting
FI	602	Corporate Valuation and Strategy
IB	644	Managing in Global Markets
MG	645	Management of Human Resources
EC	629	Business and Society
MG	669	Strategic Management

Business Electives (three courses)

Public Administration Courses

PA	601	Principles of Public Administration
PA	602	Public Policy Formulation and Implementation
PA	604	Communities and Social Change
PA	611	Research Methods in Public Administration
PA	620	Personnel Administration and Collective Bargaining in the Public Sector
PA	625	Administrative Behavior
PA	632	Public Finance and Budgeting
PA	690	Research Seminar

Public Administration Electives (two courses)

*Up to five of the six business core courses (up to 15 credits) may be waived by students who meet the waiver guidelines established for these courses within the M.B.A. program; see M.B.A. program for information.

Health Care Administration

Coordinator: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

This program of study, leading to the master of science degree, gives students the best possible preparation for careers in health care administration. The health care field is unique in that it functions in a highly regulated yet highly competitive environment. The core courses in this degree program provide students with an appreciation of the past and present in health care administration along with preparation for the future. The concentrations allow students to specialize in long-term care, human resource management in health care, medical group management, health care marketing, health policy and finance, or managed care.

In addition to earning the advanced academic degree, students who complete the concentration in long-term care become eligible to take the State of Connecticut exam for certification as a long-term care administrator.

M.S., Health Care Administration

A total of 42 graduate credits is required for completion of the master of science in health care administration. The program consists of nine required courses (27 credits) plus five courses (15 credits) that may be taken as unrestricted electives or used to complete one of the six concentrations in the master's program.

Students entering this program who lack adequate preparation in quantitative techniques may be required to undertake additional study in order to satisfy a prerequisite requirement. Adequate preparation is defined as satisfactory completion of three credits of introductory statistics.

MG	630	Management Information Systems in Health Care
MG	640	Management of Health Care Organizations*
PA	611	Research Methods
PA	625	Administrative Behavior
		or
P	619	Organizational Behavior
PA	641	Financial Management of Health Care Organizations
PA	651	Health Care Ethics
PA	669	Health Care Policy, Planning, and Execution
PA	690	Research Seminar
PS	635	Law and Public Health

Plus 5-6 electives or concentration courses

*M.S. Health Care students may use MG 640 in lieu of MG 637 to satisfy listed prerequisites for graduate courses.

Concentration in Health Care Marketing

CO	623	Communication in Health Care
CO	631	Public Information Dynamics
CO	632	Contemporary Public Relations Issues
MK	609	Marketing
		or
MK	641	Marketing Management
MK	638	Competitive Marketing Strategy

Concentration in Health Policy and Finance

PA	602	Public Policy Formulation and Implementation
PA	645	Health Care Economics and Finance
PA	653	Cost Containment in Health Care

Plus two of the following:

A	620	Financial Accounting for Managers
PA	648	Contemporary Issues in Health Care
PA	652	Introduction to Managed Care
PA	657	Health Care Reimbursements
PS	626	Decision Making in the Political Process

Concentration in Human Resource Management in Health Care

MG	645	Management of Human Resources

Plus four of the following:

CO	623	Communication in Health Care
EC	625	Industrial Relations
P	641	Personnel Development and Training
P	642	Organizational Change and Development
PA	659	Human Resource Planning in Health Care

Concentration in Long-Term Care

There are two options for the concentration in long-term care. Please contact the program coordinator prior to selecting an option as the State of Connecticut has different requirements for each.

Option I (15 credits)

PA	646	Organization and Management of Long-Term Care Facilities
PA	681	Long-Term Health Care Internship I
PA	682	Long-Term Health Care Internship II

Plus two of the following:

P	625	Life Span Development Psychology
PA	602	Public Policy Foundation and Implementation
PA	644	Administration of Programs and Services for the Aged
PS	633	The Political Process and the Aged
SH	602	Safety Organization and Administration
SO	651	Social Gerontology

Option II (18 credits)

PA	646	Organization and Management of Long-Term Care Facilities
PA	683	Long-Term Health Care Internship

Plus four of the following:

P	625	Life Span Development Psychology
PA	602	Public Policy Foundation and Implementation
PA	644	Administration of Programs and Services for the Aged
PS	633	The Political Process and the Aged
SH	602	Safety Organization and Administration
SO	651	Social Gerontology

One Health Care Elective

Concentration in Managed Care

PA	647	Alternative Health Care Delivery Systems
PA	652	Introduction to Managed Care
PA	653	Cost Containment in Health Care

Plus two of the following:

CO	623	Communication in Health Care
CO	632	Contemporary Public Relations Issues
MK	609	Marketing
MK	638	Competitive Marketing Strategy

Concentration in Medical Group Management

PA	652	Introduction to Managed Care
PA	657	Health Care Reimbursements
PA	664	Survey of Medical Group Management

Plus two of the following:

A	620	Financial Accounting for Managers
MG	645	Management of Human Resources
MG	665	Compensation Administration
PA	653	Cost Containment in Health Care

In addition to the master of science program, health care concentrations are available in both the M.B.A. and M.P.A. programs, as are graduate certificates in the health care field. See Table of Contents to locate related programs.

Labor Relations

Coordinator: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

Over the past several decades, environmental forces have created a demand for greater sophistication and professionalism from those responsible for personnel functions within organizations, — public or private, profit or nonprofit, unionized or not. More and more companies and institutions are requiring the services of people conversant with both the large body of available tools and the constraints that have evolved during this period. The program leading to the master of science degree in labor relations represents a flexible response to this demand.

As a management and behavioral science discipline, labor relations is concerned with all aspects of the employment relationship and, in particular, with the organization's maintenance of the human resources necessary to achieve organizational objectives. As an academic discipline and profession, labor relations is an interdisciplinary, problem-solving field that attempts to maintain harmony and resolve conflicts among the four major parties to the employment relationship: employees, employers, government and, where applicable, unions.

The MS in labor relations program is for people employed in or aspiring to positions in various kinds of organizations in the fields of employment, training and development, wage and salary administration, employee services and benefits, labor-management relations, job and organizational design, labor economics, and manpower planning.

Admission Policy

Candidates for admission are required to hold a baccalaureate degree from an accredited institution of higher education. It is preferable that the undergraduate degree be in business administration, public administration, or a social or behavioral science (e.g., economics, history, political science, psychology, or sociology). Application for admission is also open to full-time professionals in personnel and labor relations holding a baccalaureate degree in any field from an accredited institution.

Though admission decisions are usually based on an applicant's undergraduate record, in some cases the applicant may be required to submit scores from the Graduate Management Admission Test (GMAT).

M.S., Labor Relations

A total of 30 graduate credits is required for completion of the master of science degree in labor relations. Of these, seven courses (21 credits) are required and three 9 credits are approved electives. Two concentrations are offered: a private sector Track and a public sector track. There is no thesis option.

Required Courses

EC	625	Industrial Relations
EC	627	Economics of Labor Relations
EC	687	Collective Bargaining
MG	637	Management Process
P	642	Organizational Change and Development
PA	611	Research Methods in Public Administration
PA	690	Research Seminar

Approved electives or concentration (three courses)

Private Sector Track

Three of the following:

CO	621	Managerial Communication
E	659	Writing and Speaking for Professionals
EC	679	Industrial Relations Seminar
MG	645	Management of Human Resources
MG	664	Organizational Effectiveness
MG	667	Multicultural Issues in the Workplace
MG	671	Employment Law

Public Sector Track

Three of the following:

CO	621	Managerial Communication
E	659	Writing and Speaking for Professionals
MG	667	Multicultural Issues in the Workplace
PA	620	Personnel Administration and Collective Bargaining in the Public Sector
PA	625	Administrative Behavior
PA	659	Human Resource Planning in Health Care
SH	602	Safety Organization and Administration

Graduate Certificates

The College of Business offers many 12-credit graduate certificates as options for those having a baccalaureate degree or a master's degree, who want to enroll in a part-time, short, coherent course of study at the graduate level. Those who may not be ready to commit to a full-length graduate program, as well as those who already hold a graduate degree but want to pursue additional work in the same or another field, may find that a certificate provides the perfect alternative.

Students applying to the Graduate School to enter a certificate program must complete the Graduate School application form and submit official transcripts showing completion of the undergraduate/baccalaureate degree and two letters of recommendation.

See the Table of Contents for the Academic Policies section of the catalog for a complete description of the options, regulations, and requirements for completion of a graduate certificate.

Accounting Certificate

Advisor: Robert E. Wnek, Professor, B.S.B.A., Villanova University; J.D., Widener University School of Law; L.L.M., Boston University School of Law; CPA

A certificate in accounting is recommended to students and professionals whose education already includes an accounting degree and who wish to pursue accounting at an advanced level without necessarily enrolling in the full graduate program. An accounting certificate is especially recommended to certified public accountants who wish to obtain continuing professional education credits in an academic environment. Student maytake any four of the following courses:

A	616	Taxation for Management
A	630	Topics in Corporate Financial Reporting
A	641	Accounting Information Systems
A	642	Operational Auditing
A	650	Advanced Accounting Theory*
A	652	Auditing and Assurance Services Seminar
A	654	Financial Statements: Reporting and Analysis
A	661	Managerial Accounting Seminar

Other courses may be substituted with consent of the advisor.

*Prerequisite is A 630 or two undergraduate intermediate accounting courses.

Business Management Certificate

Advisor: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

This certificate develops students' conceptual knowledge and skills in formulating corporate strategy and in determining structural and resource requirements. The courses focus on concepts and processes useful in relation to general management and on functional responsibilities in coordinating and directing the organizational effort in our ever-changing economic environment. Some of the courses in the certificate have prerequisites; consult course descriptions elsewhere in this catalog.*

MG	637	Management Process

Plus three of the following:

MG	645	Management of Human Resources
MG	655	Corporate Governance and Business Strategy
MG	662	Organizational Theory
MG	664	Organizational Effectiveness
MG	670	Selected Topics (with permission of the certificate advisor)

Other management courses may be permitted as substitutions with approval of the advisor.

*M.P.A. students should complete 12 credits of the core curriculum in the M.P.A. program, including PA 601 and PA 625, as the prerequisite for this certificate.

Finance Certificate

Advisor: C. Wentworth Boynton, Associate Professor, Finance, M.B.A., Ph.D., University of Rhode Island

The goal of the finance certificate is to prepare individuals for careers in the financial services sector as well as in modern corporate financial management. Certificate study stresses an understanding of the conceptual foundations of finance and the use of analytic techniques. Certificate candidates are required to meet the prerequisites for FI 601.

Students should contact the finance advisor as soon as possible to plan course selection.

FI	601	Financial Management
FI	602	Finance Strategy and Valuation

Plus two finance electives

Health Care Management Certificate

Advisor: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

This certificate useful for professionals and decision-makers employed in the public, private, or nonprofit sector of the health care field. Course work provides students with background and skills to enhance personal and professional development as well as the opportunity for organizational advancement.

MG	640	Management of Health Care Organizations
PA	641	Financial Management of Health Care Organizations
PA	643	Health and Institutional Planning

Plus one of the following:

MG	630	Management Information Systems in Health Care
PA	642	Health Care Delivery Systems
PA	644	Administration of Programs and Services for the Aged
PA	645	Health Care Economics and Finance
PA	646	Organization and Management of Long-Term Care Facilities
PA	647	Alternative Health Care Delivery Systems

PA	648	Contemporary Issues in Health Care
PA	651	Health Care Ethics
PA	652	Introduction to Managed Care
PA	653	Cost Containment in Health Care
PA	657	Health Care Reimbursements
PA	659	Human Resource Planning in Health Care
PA	662	Recruitment and Retention of Health Care Professionals
PA	664	Survey of Medical Group Management
PA	670	Selected Topics
PS	635	Law and Public Health

The certificate in long-term health care, leading to eligibility for the State of Connecticut licensing examination in long-term care administration, is described on the next page.

Human Resources Management Certificate

Advisor: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

This certificate is for the human resources professional or the individual in an allied field who aspires to increase proficiency in human resources management. The program provides an overview of the field and an opportunity to study various subfunctions (such as training, compensation and benefits, or industrial relations) in greater depth.

MG	645	Management of Human Resources

Plus three of the following:

EC	625	Industrial Relations
MG	627	Human Resources and Financial Decision-Making
EC	679	Industrial Relations Seminar
EC	687	Collective Bargaining
MG	637	Management Process
MG	663	Leadership and Team Building
MG	664	Organizational Effectiveness
MG	665	Compensation Administration
MG	667	Multicultural Issues in the Workplace
MG	678	Personnel Management Seminar
MG	671	Employment Law
P	619	Organizational Behavior
P	628	The Interview
P	641	Personnel Development and Training
P	642	Organizational Change and Development
P	643	The Psychology of Conflict Management I
PA	620	Personnel Administration and Collective Bargaining in the Public Sector
SH	602	Safety Organization and Administration

Selection of electives must have the approval of the program advisor.

International Business Certificate

Advisor: Ben B. Judd, Professor, Ph.D., University of Texas at Arlington

This certificate prepares managers to deal with current problems and methods of analysis related to international business. The program includes basic techniques and skills, such as adapting to new political and cultural environments, which are not normally covered by traditional courses.

IB	644	Managing in Global Markets

Plus three of the following:

EC	641	International Economics
		or
FI	632	International Financial Management
IB	645	Comparative International Business Environments
IB	650	International Business Negotiating
MK	651	International Marketing
IB	652	Multinational Business Management
IB	660	East and Southeast Asian Business Systems
IB	670	Selected Topics
IB	693	Internship
MK	639	Marketing Research and Information Systems

Long-Term Health Care Certificate

Advisor: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

This certificate is approved by the Department of Health Services, State of Connecticut, as a course of study in long-term health care. Students who complete this 12-credit certificate are eligible to take the state licensing examination for long-term care administration, preparing individuals for participation in this area of expanding opportunities for health care practitioners.

The long-term care certificate is available in two options. Please contact the program coordinator prior to selecting an option as the State of Connecticut has different requirements for each.

Option I

PA	641	Financial Management of Health Care Organizations
PA	646	Organization and Management of Long-Term Care Facilities
PA	681	Long-Term Health Care Internship I
PA	682	Long-Term Health Care Internship II

Option II

PA	641	Financial Management of Health Care Organizations
PA	646	Organization and Management of Long-Term Care Facilities
PA	683	Long-Term Health Care Internship

One health care elective

Management of Sports Industries Certificate

Advisor: Gil B. Fried, Professor, J.D., Ohio State University

This certificate is for those contemplating a career in some segment of the sports industry or for those already working in the field and interested in advancing their careers. Courses are designed to enhance knowledge and skills in sports marketing and public relations as well as in the management of professional and school-based sports, facilities, and fitness and wellness programs.

MG	610	The Sports Industry

Plus three of the following:

MG	611	Sports Industry Marketing, Promotion, and Public Relations
MG	612	Sports Law
MG	613	Sports Facility Management
MG	617	Applied Fiscal Management for Sports and Facility Managers
MG	618	College Sports Administration
MG	694	Internship

Other courses may be substituted with the consent of the certificate advisor.

Marketing Certificate

Advisor: Ben B. Judd, Professor, Ph.D., University of Texas at Arlington

The certificate in marketing enables the student to acquire a deeper understanding of marketing phenomena and to develop analytic skills. Special emphasis is given to the development of content knowledge and skills necessary for operating managers of the marketing function. It is suggested that MK 641 Marketing Management and MK 639 Marketing Research and Information Systems, if taken, be preceded by other courses in the program. Note that MK 609 and MG 637 are prerequisites for the certificate. Also note that QA 604 is a prerequisite for QA 675.

MK	641	Marketing Management

Plus three of the following:

MK	616	Buyer Behavior
MK	632	Nonprofit and Services Marketing
MK	638	Competitive Marketing Strategy
MK	639	Marketing Research and Information Systems
MK	643	Product Management
MK	645	Distribution Strategy
QA	675	Computer-Aided Multivariate Analysis

Public Administration Certificate

Advisor: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

This certificate provides training at the graduate level for those in public service. Course work focuses on the analytic, quantitative, administrative, and managerial knowledge and skills needed to meet the complex problems and responsibilities of government agencies and organizations.

PA	601	Principles of Public Administration
PA	602	Public Policy Formulation and Implementation
PA	620	Personnel Administration and Collective Bargaining in the Public Sector
PA	630	Fiscal Management for Local Government
		or
PA	632	Public Finance and Budgeting

Public Management Certificate

Advisor: Charles N. Coleman, Assistant Professor, M.P.A., West Virginia University

This certificate provides a broad overview of the most current thinking in public management. Courses emphasize conceptual and analytic skill building. Students may select either a survey of the field or public personnel management.

Option I: Survey of the Field

Any four of the following:

EC	665	Urban and Regional Economic Development
PA	611	Research Methods in Public Administration
PA	620	Personnel Administration and Collective Bargaining in the Public Sector
PA	625	Administrative Behavior
PA	630	Fiscal Management for Local Government
PA	632	Public Finance and Budgeting
PS	608	The Legislative Process

Option II: Public Personnel Management

EC	625	Industrial Relations
PA	620	Personnel Administration and Collective Bargaining in the Public Sector
PA	625	Administrative Behavior

Plus one of the following:

MG	645	Management of Human Resources
MG	665	Compensation Administration
P	643	The Psychology of Conflict Management I
P	646	The Psychology of Conflict Management II
SH	602	Safety Organization and Administration

Taxation Certificate

Advisor: Robert E. Wnek, Professor, B.S.B.A., Villanova University; J.D., Widener University School of Law; L.L.M., Boston University School of Law; CPA

This certificate is for accountants and practitioners who wish to improve or update their tax skills, including practicing CPAs needing continuing education credits and others seeking to expand their tax backgrounds.

Any four of the following:

A	601	Federal Income Taxation I
A	602	Federal Income Taxation II
A	604	Taxation of Business Entities
A	605	Partnership and Limited Liability Company Income Taxation
A	606	Corporate Income Taxation
A	607	Qualified Plans
A	608	Taxation of Estates, Gifts, and Trusts
A	609	Federal Tax Practice and Procedure
A	610	International Taxation
A	611	State and Local Taxation

Other courses may be substituted with consent of the advisor.

TAGLIATELA COLLEGE OF ENGINEERING

Barry J. Farbrother, B.Sc. (Hons), Ph.D., C.Eng., Eur. Eng., Dean

M. Ali Montazer, B.S., M.S., Ph.D., Associate Dean

Few professions can match engineering for challenge and excitement. The changing face of engineering will shape the world in the twenty-first century—a world of exotic materials, staggering telecommunications and computing capabilities, cybernetic factories, opportunities to renew our aging infrastructure, and the challenge of identifying and harnessing renewable forms of energy and providing public works needed by society. Exciting developments such as tissue engineering, are occurring at the interface between the physical and life sciences. Engineers and scientists are working to realize benefits in the micro miniature world of nanotechnology. The mission of the Tagliatela College of Engineering is to prepare individuals for professional practice in diverse areas of engineering, chemistry, computer science, and information technology. In addition, the College prepares individuals for lifelong education in their professional careers and for such formal post-baccalaureate education as their inclination and professional growth require. Master of science degree programs are offered through the Graduate School—in computer science, electrical engineering, environmental engineering, industrial engineering, mechanical engineering, and engineering management (M.S.E.M.). A dual degree program combines the master's in business administration (M.B.A.) with the master of science in industrial engineering. Graduate certificates are offered in civil engineering design, computer applications, computer programming, computing, Lean/Six Sigma, logistics, network administration, and quality engineering. At the undergraduate level, the College offers bachelor's degrees in chemistry, computer science, information technology, and general engineering along with five bachelor's degrees in chemical, civil, computer, electrical, and mechanical engineering, which are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET). Also offered is a bachelor's degree in computer science, which is accredited by the Computing Accreditation Commission of the Accreditation Board for Engineering and Technology (CAC/ABET). A new B.S. degree in system engineering is being offered.

Computer Science

Coordinators

Graduate Advisor: Barun Chandra, Associate Professor, Ph.D., University of Chicago

Graduate Admissions Coordinator: Tahany Fergany, Professor, Ph.D., University of Connecticut

This program provides advanced professional training in computer science and gives students a diversity of experience and subject matter through its distribution, concentration, elective, and project requirements. Its broad scope recognizes the continuing development of computing disciplines and applications, and allows students to prepare for these areas. The program enables students to enter, or advance in, the computing profession or an allied field, along a variety of career paths. It can also prepare students for further graduate study.

Admission Policy

This program is designed to accommodate students with no prior programming experience as well as those who already hold an undergraduate degree in computer science. Applicants are expected to demonstrate that they have completed a baccalaureate degree and a course in college algebra prior to enrolling. Submission of GRE scores is not required.

M.S., Computer Science

Students with an adequate background in computer science will complete 30 credits of course work consisting of 9 credits of distribution courses, 9 of concentration courses, and 12 credits of electives. Within these 30 credits, students must satisfy a project requirement and a programming language requirement. Students with a background other than computer science may need to complete up to 18 additional credits of core courses. Any of the six required core courses may be waived on the basis of appropriate undergraduate or graduate courses, subject to the approval of the Computer Science graduate admissions coordinator. Students are expected to complete the core courses soon after joining the program; until all core courses have been either waived or completed, a student is not allowed to enroll in more than three non-core courses. Required non-core courses cannot be waived, but transfer credit and substitutions may apply. The curriculum is being updated constantly. The most up-to-date version of the program can be obtained from either of the graduate coordinators.

Placement Policy

Students are placed in the programming sequence by the graduate coordinators. Those with sufficient experience in C programming might start in CS 610 or CS 620. A beginning programmer starts with CS 604, which is a prerequisite to the core and can be counted as the student's single free elective. Students who feel they have the programming skills to skip CS 604 must take a placement exam. New students should take CS 630 and CS 640 at the start of the program; these are core courses with no prerequisites.

Before enrolling in any course, students must make sure that they meet the prerequisites for that course (as specified in the course description).

Normally, a grade of B- or better may be used for prerequisite courses to meet our expectations for mastery of the subject. Credit may be denied for a course taken without first satisfying its prerequisites unless prior written approval was obtained from the graduate advisor.

Core Courses (18 credits, waivable)

CS	610	Intermediate Programming/C
CS	620	Data Structures
CS	630	Introduction to Computing Theory
CS	632	Algorithm Design and Analysis
CS	640	Computer Organization
CS	644	Operating Systems

Distribution Courses (9 credits not waivable)

Select one course from each of the following three categories:

Software Design Methodology (choose one)

CS	623	Rapid Software Development/VB.Net
CS	626	Object-Oriented Principles and Practice/C++
CS	628	Object-Oriented Analysis and Design
CS	655	Web-Database Application Development

Theory and Analysis (choose one)

CS	634	Cryptography and Data Security
CS	636	Structure of Programming Languages
CS	660	Artificial Intelligence

Computer Systems (choose one)

CS	640B	Parallel Computer Architectures
CS	642	Computer Networks and Data Communication
CS	644B	Distributed Operating Systems
CS	645	Network Administration
CS	647	Systems Programming

Concentration Courses and Project Requirement (9 credits)

There are two ways to satisfy the project requirement: (1) by extending and completing a significant project begun within a concentration course, or (2) by completing CS 690 Project. In either case, the project content must be in the student's concentration area.

If a student completes a project within a course, no additional tuition payment is due for that project, and no additional credit is given for it. The instructor for the project course must agree, at the beginning of the trimester, to accept the project in fulfillment of degree requirements. Suggested courses for this purpose include CS 617, CS 623, CS 626, CS 627, CS 628, CS 640B, CS 642, CS 644B, CS 647, CS 650, CS655, CS 657, CS 660, and CS 665.

In order to take CS 690 Project, the student's QPR must be 3.1 or higher. Taking CS 690 Project will count as a concentration course in addition to satisfying the project requirement. Students who plan to take CS 690 Project must ask a full-time faculty member to be the project advisor. They must also prepare a project proposal and obtain written approval of the project prior to registration.

There are five possible concentration areas. Each student must complete three courses in a concentration. Some courses belong to the lists of both distribution and concentration courses, but a single course cannot be used to satisfy both requirements.

Advanced Applications Concentration

CS	650	Computer Graphics
CS	660	Artificial Intelligence
CS	663	Mobile Robotics
CS	665	Digital Image Processing
CS	690	Project
IE	681	System Simulation
IE	682	Advanced System Simulation

Computer Systems Concentration

CS	640B	Parallel Computer Architectures
CS	642	Computer Networks and Data Communication
CS	644B	Distributed Operating Systems
CS	645	Network Administration
CS	647	Systems Programming
CS	652	Script Programming for Network Administration
CS	690	Project
EE	602	Microprocessors
EE	658	Embedded Applications

Database and Information Systems Concentration

CS	622	Database Systems
CS	622B	Advanced Database Systems
CS	623	Rapid Software Development/ VB.NET
CS	627	Distribution Systems
CS	655	Web-Database Application Development
CS	690	Project

Network Systems Concentration

CS	634	Cryptography and Data Security
CS	642	Computer Networks and Data Communication
CS	644B	Distributed Operating Systems
CS	645	Network Administration
CS	646	Introduction to Computer Security
CS	646B	Topics in Computer Security
CS	649	Network Analysis
CS	652	Script Programming for Network Administration
CS 690		Project

Software Engineering and Development Concentration

CS	617	Java Programming
CS	623	Rapid Software Development/VB.NET
CS	625	Software Project Management
CS	626	Object-Oriented Principles and Practice/C++
CS	628	Object-Oriented Analysis and Design
CS	655	Web-Database Application Development
CS	657	Human-Computer Interaction
CS	690	Project

Electives (12 credits)

At least three elective courses must be chosen from the list of restricted electives. The fourth elective course may be either a restricted or a free elective.

Restricted Electives

The restricted electives include both distribution courses and concentration courses. Some CS 670 Selected Topics courses may also be designated as restricted electives on a case-by-case basis.

Note: The core courses are not restricted electives. In addition, CS 604 is not a restricted elective, but may be counted as a student's free elective.

EE	603	Discrete and Continuous Systems I
EE	634	Digital Signal Processing I
EE	685	Optimization of Engineering Systems
EE	620	Fuzzy Logic and Control
EE	645	Introduction to Communication Systems
EE	656	Hardware Description Language
EE	658	Embedded Applications
IE	601	Introduction to Operations Research/Managment Science
IE	607	Probability Theory
IE	609	Descriptive and Inferential Statistics
IE	621	Linear Programming
IE	622	Queuing Theory
IE	623	Decision Analysis
IE	624	Quality Analysis
IE	681	System Simulation
IE	682	Advanced System Simulation
IE	685	Theory of Optimization
IE	688	Design of Experiments
M	611	Matrix Theory and Its Applications
M	615	Linear Mathematics and Combinatorics
M	620	Numerical Analysis
M	624	Applied Mathematics

Free Elective

A free elective may be any CS graduate course or any relevant course listed by Criminal Justice/Forensic Science, Mathematics, Molecular Biology, or a department in the Tagliatela College of Engineering or in the College of Business. A student who wants to take a free elective other than those indicated here must obtain written approval from the graduate advisor.

Programming Language Requirement

Each student must demonstrate mastery of a programming language other than C. This may be accomplished in one of two ways: (1) by completing at least one programming languages course listed below, or (2) submitting prior work (subject to the approval of the graduate advisor), which demonstrates knowledge of a programming language other than C.

Programming Language Courses

CS	617	Java Programming
CS	623	Rapid Software Development/VB.Net
CS	626	Object-Oriented Principles and Practice/C++
CS	652	Script Programming for Network Administration
CS	655	Web-Database Application Development

Electrical Engineering

Coordinator: Bouzid Aliane, Professor, Ph.D., Polytechnic Institute of New York

The master of science in electrical engineering (M.S.E.E.) provides students and practicing engineers alike with a background for analysis, design, development, or research on electrical or computer engineering systems in a spectrum of professional settings. It enables students to expand and deepen their knowledge beyond the baccalaureate degree and gives them the ability to adapt to ever-changing technological developments.

Unique features of the program include the following:

- The program is structured in two options — electrical engineering and computer engineering.
- Students enjoy the learning environment, which offers advantages such as small class size, low student-faculty ratio, excellent interaction with dedicated faculty, and student participation in funded research activities.

- The M.S.E.E. program is open to both part-time and full-time students.
- Areas of research and study at the graduate level include communications, control, digital signal processing, digital system design and simulation, microprocessor systems, optical sensors, embedded systems, computer architecture, computer engineering, computer networks, VLSI design, and other relevant areas of electrical and computer engineering.

Admission Policy

To be eligible for admission to the electrical and computer engineering graduate program, a student must have an undergraduate degree in electrical engineering from a program accredited by the Accreditation Board for Engineering and Technology (ABET), or its equivalent, showing a strong academic record with at least a B average. In some instances, students who do not meet the above criteria may be considered for admission on the basis of their current status, goals, and potential for success in the program. Such students may be admitted to the program subject to making up deficiencies in their undergraduate studies. Students with deficiencies must either (1) take a course and earn a grade of B or better, or (2) pass a proficiency exam on the subject. Students are advised to rectify deficiencies before attempting to enroll in graduate-level courses.

Applicants must submit two letters of recommendation (professional or academic) from individuals familiar with their potential for success with graduate study. Applicants also must submit official transcripts of undergraduate work completed.

International students are required to submit Graduate Record Examination (GRE) scores to provide additional information for the admission decision.

A student need not be admitted to the program in order to enroll in an individual course; however, approval should be obtained from the course instructor. Courses completed prior to achieving official admission may be applied to the degree requirements with the approval of the program coordinator.

Transfer Credit

The transfer of graduate credit from other institutions may be permitted with the approval of the program coordinator and subject to Graduate School policy on transfer credit detailed elsewhere in this catalog.

Financial Support

Financial support is available through teaching or research assistantships. Financial support is offered to those students who, in the estimation of the Department faculty, hold greatest promise of being successful graduate students.

Research Project/Thesis Requirement

Students may elect to undertake a thesis for partial fulfillment (six or nine credits) of the requirements for the degree, provided that they have at least a 3.2 QPR or a strong endorsement from their advisor. The thesis must be a well-written document on an original topic of research or development in electrical and computer engineering. It must show the ability to organize materials in a clear and original manner and to present well-reasoned conclusions. The student must write a master's thesis and successfully defend it at a final oral presentation. Thesis preparation and submission must comply with Graduate School policy on theses as well as with specific department requirements. Detailed information concerning these requirements is available from the Department office.

Students who do not elect to undertake thesis work must complete a research project (EE 690). A written final report and an oral presentation are required. The oral presentation is intended to verify that the research represents the student's own contribution to knowledge and to test the student's understanding of research. One copy of the final draft must be submitted to the graduate coordinator.

M.S., Electrical Engineering

Students with an adequate background in electrical engineering will complete 36 graduate credits beyond the baccalaureate degree to earn the master

of science degree in electrical engineering. Students with an inadequate background may need to complete up to two additional preparatory courses. Students are placed in preparatory courses on the basis of placement tests.

The M.S. in electrical engineering is structured in two options: electrical engineering and computer engineering. Candidates must complete the specific requirements for the degree/option selected. Students may be required to take additional courses if, in the advisor's opinion, their background is not appropriate for the curriculum or option selected.

Option I: Electrical Engineering

This option is for students who wish to focus their study in communication systems, control systems, digital signal processing, digital image processing, or optical sensors. In addition to the four required courses, eight electives are chosen in consultation with the student's advisor or program coordinator.

Required Courses

The required courses stress understanding of the mathematics and modeling techniques of electrical engineering systems. A student must take the following courses to complete the graduate course requirement:

One mathematics course*

Plus the following:

EE	603	Discrete and Continuous Systems I
EE	634	Digital Signal Processing I
EE	650	Random Signal Analysis
EE	690	Research Project or Thesis EE 697 and EE 698

*Chosen in consultation with the program coordinator. M 611 Matrix is strongly recommended. Students may not take M 610 or M 616 for credit in this degree option.

Concentration Courses

In addition to the required graduate courses a student must select an area of concentration and complete at least four courses (12 credits) listed in the chosen concentration area.

Communications/DSP Area

EE	645	Introduction to Communication Systems
EE	646/647	Digital Communications I/II
EE	648	Microwave Engineering
EE	649	Wireless Communications
EE	680	Fiber Optic Communications
EE	635	DSP II
EE	653/	
CS	665	Digital Image Processing

Control System Area

EE	604	Discrete and Continuous Systems II
EE	605	Computer Controlled Systems
EE	606	Robot Control
EE	607	Adaptive Control
EE	685	Optimization of Engineering Systems

Students take the remaining graduate course work outside the concentration area. Three electives (9 credits) must be chosen from the following list:

Electives

CS	623	Rapid Software Development/VB.NET
CS	642	Computer Networks and Data Communication
CS	645	Network Administration
EE	605	Computer Control Systems
EE	606	Robot Control
EE	607	Adaptive Control
EE	620	Fuzzy Logic and Control
EE	630/631	Electronic Instrumentation I/II
EE	634/635	Digital Signal Processing I/II
EE	637/638	Power Systems Engineering I/II
EE	639	Electric Power Distribution
EE	645	Introduction to Communication Systems
EE	646/647	Digital Communications I/II
EE	652	Design of Digital Filters
EE	658	Embedded Applications
EE	670	Selected Topics

EE	680	Fiber Optic Communications
EE	681	Lightwave Technology
EE	685	Optimization of Engineering Systems
EE	695	Independent Study
EE	697/698/ 699	Thesis I, II, and III
M	611	Matrix Theory and Its Applications

With the approval of the program coordinator or academic advisor, two of the electives may be taken in other disciplines of mathematics, engineering, physics, or computer science. Other EE courses may be taken as electives with the approval of the program coordinator or academic advisor.

Option II: Computer Engineering

The M.S. in electrical engineering with a computer engineering option is designed to serve those students who wish to obtain advanced knowledge in the applications of electrical engineering principles to the design of computer-based systems. Electrical engineers with B.S.E.E. degrees find an increasing amount of their professional activity devoted to projects related to computer engineering. Almost any system or instrument now contains an embedded computer along with its own operating system and software which, in many cases, are written and maintained by electrical engineers. This option seeks to help these engineers by offering more graduate work in the computer engineering area under the M.S.E.E. degree program.

Required Courses

CS	620	Data Structures
CS	644	Operating Systems
EE	610	Networking
EE	656	Hardware Description Language
EE	657	VLSI Design
EE	658	Embedded Applications
EE	682	Computer Architecture
EE	690	Research Project or Thesis EE 697 and EE 698

Electives

Four electives (12 credits) from ECE or CS Department

These courses may be replaced by other courses if a student can demonstrate equivalent knowledge of the subject.

Students who elect to write a thesis will register for EE 697 and 698 Thesis I and II in lieu of EE 690 and one of the elective courses in the program.

Electives must be approved by the program coordinator or the academic advisor. Electives may be taken from other departments with the approval of the program coordinator or the academic advisor. CS 610 or any other introductory course in C programming cannot be used as an elective. Students with deficiency in this area must take CS 610 in addition to the regular course work for the computer engineering option in the M.S.E.E. program.

CS	640B	Parallel Computer Architecture
CS	650	Computer Graphics
CS	642	Computer Networks and Data Communication
CS	623	Rapid Software Development/VB.NET
CS	645	Network Administration
EE	603	Discrete and Continuous Systems I
EE	604	Discrete and Continuous Systems II
EE	605	Computer Controlled Systems
EE	606	Robot Control
EE	607	Adaptive Control
EE	620	Fuzzy Logic and Control
EE	630/631	Electronic Instrumentation I/II
EE	634/635	Digital Signal Processing I/II
EE	637/638	Power Systems Engineering I/II
EE	639	Electric Power Distribution
EE	645	Introduction to Communication Systems
EE	646/647	Digital Communications I/II
EE	650	Random Signal Analysis
EE	652	Design of Digital Filters
EE	670	Selected Topics
EE	680	Fiber Optic Communications
EE	681	Lightwave Technology
EE	685	Optimization of Engineering Systems
EE	695	Independent Study
M	611	Matrix Theory and Its Applications

With the approval of the program coordinator or academic advisor, two of the elective courses may be taken in other disciplines of mathematics, engineering, physics, or computer science. Other EE courses may be taken as elective courses with the approval of the program coordinator or academic advisor.

Environmental Engineering

Coordinator: Agamemnon D. Koutsospyros, Professor, Ph.D., Polytechnic University

The program is designed to prepare engineers for successful and dynamic careers in the continuously expanding field of environmental engineering. Due to its interdisciplinary nature, the program allows students to take a combination of courses in related areas.

In a rapidly changing and increasingly interconnected world, pollution problems have aroused individual and public awareness. Environmental engineering has expanded rapidly to include areas such as water and air pollution, groundwater contamination, solid and hazardous waste management, industrial waste treatment, pollution prevention, and sustainable development. Numerous employment opportunities are available for environmental engineers in federal, state, and local government as well as in the industrial and private sectors.

The program provides the advanced educational skills necessary to meet the ever-changing needs and challenges of the field. It offers vigorous, professionally oriented courses, case studies, new technology, and research opportunities.

Admission Policy

Candidates for admission to the master's program are expected to have a grade point average of 3.0 or better (on a 4.0 scale) in their undergraduate major course work and to hold a baccalaureate degree in civil or environmental engineering from a program accredited by the Accreditation Board for Engineering and Technology (ABET) or equivalent accreditation. Applications from candidates with an ABET-accredited or equivalent engineering degree in an area of study outside civil/environmental engineering and with a minimum undergraduate grade point average of 3.0 will be considered. However, such students may be required to complete certain undergraduate civil/environmental engineering courses as a condition of acceptance. Applicants are urged to submit scores from the Graduate Record Examination (GRE) general test to aid in the evaluation process.

In general, engineering students who do not meet the above criteria or students with non-engineering undergraduate degrees are not considered for admission. However, a potential candidate who does not meet the admission criteria may, with the approval of the department chairperson, pursue a program of study that includes a sequence of undergraduate courses to satisfy deficiencies. Only after the completion of such a program of study will the student be considered for admission to the graduate program in environmental engineering.

M.S., Environmental Engineering

A total of 39 credits (12 3-credit courses plus a 3-credit research project) must be completed to earn the master of science degree in environmental engineering. Nine courses, exclusive of the research project, must be selected from courses designated as environmental engineering. Three courses may be selected from outside the environmental engineering department. Enrollment in non-environmental engineering electives, other than those listed on the next page, requires approval of the program coordinator. Transfer credit from other institutions is permitted subject to Graduate School policy on transfer credit detailed elsewhere in this catalog.

Required Courses

Approved Environmental Engineering Courses (9 courses)
CE 690 Research Project
Approved Electives (3 courses)

Concentrations in Environmental Engineering

Students may elect to pursue a sequence of courses in one of three areas of concentration, or they may tailor a program of study to meet specific individual

needs or objectives within the constraints of the program. At the time of admission to the program, each student is assigned a faculty advisor to assist the student in formulating a program of study and identifying an appropriate research project.

Concentration in Industrial and Hazardous Wastes

Concentration Advisor: Agamemnon D. Koutsospyros, Professor, Ph.D., Polytechnic University

Suggested Courses

CE	601	Physical-Chemical Treatment of Aqueous Wastes
CE	602	Biological Treatment of Aqueous Wastes
CE	603	Contaminant Fate and Transport in the Environment
CE	605	Solid Waste Management
CE	606	Environmental Law and Legislation
CE	610	Pollution Prevention Management Technologies
CE	613	Industrial Wastewater Control
CE	618	Hazardous Waste Treatment
CE	661	Air Pollution Fundamentals
CE	690	Research Project
CM	622	Air Pollution Control

Approved Electives (three courses)

Concentration in Water and Wastewater Treatment

Concentration Advisor: Agamemnon D. Koutsospyros, Professor, Ph.D., Polytechnic University

Suggested Courses

CE	601	Physical-Chemical Treatment of Aqueous Wastes
CE	602	Biological Treatment of Aqueous Wastes
CE	603	Contaminant Fate and Transport in the Environment
CE	606	Environmental Law and Legislation
CE	610	Pollution Prevention Management Technologies
CE	612	Advanced Wastewater Treatment
CE	613	Industrial Wastewater Control
CE	617	Wastewater Residuals Management
CE	690	Research Project
CH	601	Environmental Chemistry

Approved Electives (three courses)

Concentration in Water Resources

Concentration Advisor: Jean Nocito-Gobel, Assistant Professor, Ph.D., University of Massachusetts

Suggested Courses

CE	603	Contaminant Fate and Transport in the Environment
CE	606	Environmental Law and Legislation
CE	614	Surface Water Quality Management
CE	615	Groundwater Hydrology
CE	616	Contaminant Hydrology
CE	620	Engineering Hydrology
CE	621	Advanced Hydrology
CE	623	Open Channel Hydraulics
CE	624	Computer Applications in Hydrology/Hydraulics
CE	690	Research Project

Approved Electives (three courses)

Non-Environmental Engineering Electives

E	659	Writing and Speaking for Professionals
EN	600	Environmental Geoscience
EN	602	Environmental Effects of Pollutants
EN	607	Environmental Reports and Impact Assessment
EN	618	Hazardous Materials Management
EN	640	Introduction to Geographical Information Systems
EN	641	Geographical Information System Techniques and Applications I
EN	642	Geographical Information System Techniques and Applications II
M	620	Numerical Analysis

Other courses may be taken as electives with the written approval of the program coordinator.

Master of Science in Engineering Management

Coordinator: Barry J. Farbrother, Professor and Dean, Tagliatela College of Engineering, Ph.D., University of Hertfordshire, England

This program provides technical professionals with the knowledge and skills they need to be successful. Created specifically for those directly and indirectly involved in managing technology or engineering, the program integrates courses on the latest technical developments with business-related studies such as marketing and accounting. Taught in a cohort format by exceptional leaders in their fields, the master of science degree in engineering management is designed for busy adults and is the only graduate program of its kind in Connecticut. The program includes advanced learning in quality assurance, resource use optimization, modern production scheduling and control, supply chain management, and system simulation and project management. Additional topics include organizational development, financial management, marketing management, and leadership. The experienced engineering manager, typically not holding a graduate degree, requires state-of-the-art educational exposure to information directly related to his or her technical work environment that goes beyond the traditional MBA. MSEM is specifically designed to provide this exposure.

Admission Policy

Application for admission is made to the UNH Graduate School. Qualified applicants should hold a bachelor's degree in a technical discipline from an accredited institution, or equivalent. Five or more years' experience in a supervisory role in engineering, technical staff support, engineering or systems management, project management, systems engineering, manufacturing, logistics, industrial engineering, military operations, or quality assurance is viewed as a minimal requirement for admission. The applicant should be sponsored or nominated by his/her employer. Individuals with unique or extraordinary qualifications and a bona fide reason to enroll in the program are encouraged to apply and to present their cases for admission. The Industrial Engineering faculty, in consultation with the Graduate School and the dean of the Tagliatela College of Engineering, make final decisions on admission.

Applicants to the program must be suitably qualified for both the M.S.E.M. courses (EXIE) and the five Executive M.B.A. courses (EXID). In cases where deficiencies exist that are likely to impede success in a given course, students may be required to seek prerequisite education or meet certain academic conditions before enrollment in that course is permitted. The nature of the program requires that all participants, even if drawn from highly diverse backgrounds and occupations, share common skills and abilities that permit teamwork and successful learning in any given module.

M.S., Engineering Management

The M.S.E.M. program consists of 18 modules (54 credits) scheduled into consecutive academic years. The modules are sequenced for prerequisite purposes, and students are expected to follow the entire sequence with their entering class. Nine modules are scheduled for each academic year. Each module runs for five consecutive weeks on a given weekday for six hours, usually from 4–10 p.m. An M.S.E.M. class generally meets on the same weekday afternoon for the entire two-year program period.

A research paper is required, and in the final module it is presented to the class and properly defended. For program completion, research papers must receive approval by the M.S.E.M. program coordinator and academic advisor.

Modules

EXIE 901	Engineering Management Concepts
EXIE 902	Managing Uncertainty
EXIE 903	Statistics for Quality and Engineering Management
EXIE 957	Organizational Change and Development
EXIE 914	Achieving Optimal Operations
EXID 912	Financial Accounting
EXIE 926	Constraint Assessment

EXIE 930	Project Management
EXIE 948	Queuing Theory and Applications
EXIE 950	Simulation of Processing Systems
EXID 921	Executive Management and Leadership
EXIE 940	Supply Chain Management
EXID 924	Financial Management I
EXIE 960	E-Solutions in Engineering Management
EXID 930	Marketing Practice
EXIE 956	Managing Quality Assurance
EXIE 970	Current Topics in Engineering Management
EXIE 999	Research Topic

Industrial Engineering

Coordinator: Alexis N. Sommers, Professor, Ph.D., Purdue University

As an established engineering discipline, industrial engineering in its modern phase designs, builds, and optimizes systems in all parts of modern life, including manufacturing, government, education, aerospace, transportation, logistics, and service industries. The M.S.I.E. program provides graduate education for industrial engineers and for engineers and scientists in other disciplines who seek advanced course work in systems optimization, quality assurance, manufacturing, engineering management, procurement, and the efficient use of both human and technological resources. The program offers excellent preparation for advancement in manufacturing organizations and for those seeking management positions in operations, supply chain, and technology.

M.S.I.E. Placement

For candidates holding the B.S.I.E. or similar degree, with a QPR of 3.0 or higher from an ABET-accredited program, the M.S.I.E. can be obtained with as few as 30 credits. Inadequate undergraduate preparation or prerequisite deficiencies identified by the coordinator or faculty advisor may result in a requirement of more than 30 credits. For candidates not holding a B.S.I.E. from an accredited institution, the expectation is 45 credits for the M.S.I.E. degree. Certain courses may be waived for qualified candidates, reducing the expectation to less than 45 credits. A plan of study incorporating waivers, required courses, transfers, or substitutions, is prepared for each candidate in the first term of attendance at the university. The plan of study is modified as needed as a student progresses through the program. A capstone project or thesis is required of all candidates, and constitutes an elective. Projects are often team efforts involving an industrial or corporate problem.

A required course can be waived if a candidate can provide the program coordinator with evidence that the course content was learned elsewhere, and he or she earned a grade of B or better. Transcripts, course syllabi, textbooks, and testimonials are the usual evidence of equivalent learning. In some cases, an examination may be required. Course waivers, transfer credits, or substitutions are signed by the program coordinator and filed with the Graduate Registrar. Credit may be transferred from other institutions, and a required course may sometimes be replaced by a substitute course, all with the approval of an advisor or program coordinator. In no case, however, will the M.S.I.E. be awarded for less than 30 credits taken at the university.

Admission Policy

Candidates for admission are expected to hold an undergraduate degree in engineering, science, or business with strong quantitative background granted by a regionally accredited U.S. institution or recognized foreign university. Competency in mathematics through calculus is also expected. Deficiencies can be remedied by enrolling in certain undergraduate and graduate courses at the university. Courses are taught in English, and proficiency scores must satisfy Graduate School requirements. Decisions on admission are made after a careful review of candidates application portfolio.

Research Project/Thesis Requirement

All students in the program complete a thesis or an appropriate special project that partially fulfills the elective requirements. The special project requirement usually can be satisfied by a group

research project course. A designated area of study may be indicated for each research project course; the instructor will offer direction and assist students in the development of substantial individual projects. Particular requirements or prerequisites may be set for the course. With special approval, a student may elect to write a thesis or take an individual research project course (as listed in the catalog).

M.S.I.E. Program Components

Required Courses (15 credits)[1]

IE	623	Decision Analysis
IE	624	Quality Analysis
IE	681	System Simulation
EM	641	Supply Chain Management
IE	688	Design of Experiments

Electives (15 credits)[2]

Five courses from the following:

EM	627	Value Engineering and Design
EM	628	Six Sigma Quality Planning
EM	639	Achieving Optimal Operations
IE	615	Transportation and Distribution
IE	643	Reliability and Maintainability
IE	682	Advanced System Simulation
LG	663	Logistics in Acquisition and Manufacturing

Foundation Courses (15 credits)[3]

IE	601	Introduction to Operations Research/Management Science
IE	607	Probability Theory
IE	609	Descriptive and Inferential Statistics
IE	651	Human Engineering I
IE	655	Manufacturing Analysis

(1) A required course may be substituted, but not waived, if the student can demonstrate to the program coordinator equivalent knowledge at a grade of B or better.

(2) Five graduate courses, one of which must be IE 690 Research Project. Electives may be courses taken outside the IE, EM, and LG areas, with the approval of an advisor or program coordinator.

(3) For candidates without a B.S.I.E. degree from an ABET-accredited institution, or equivalent, the program is 45 credits, and requires additional foundation courses, up to 15 credits.

Every candidate meets with an advisor, or with the program coordinator, to produce a plan of study. The plan of study is filed with the Graduate Registrar, and plan to be followed unless officially modified and approved. Interdisciplinary work is encouraged.

Industrial Engineering Dual Degree Program (M.B.A./M.S.I.E.)

Coordinator: Alexis N. Sommers, Professor, Ph.D., Purdue University

The Graduate School has always encouraged interdisciplinary studies. To foster a broader expertise in the areas of business administration and industrial engineering, a student can earn degrees in both fields by successfully completing the dual degree program.

The program is intended for students with undergraduate engineering or technical degrees from programs accredited by the Accreditation Board for Engineering and Technology, or demonstrated equivalent. Students entering this program are expected to be competent in mathematics through calculus. Those with insufficient mathematics background are required to take approved mathematics courses (e.g., M 610 Fundamentals of Calculus) outside/in addition to the program requirements.

Applicants with degrees in fields other than industrial engineering are required to take a number of undergraduate courses, or otherwise demonstrate proficiency in areas normally included in an undergraduate industrial engineering program.

Applicants are required to meet the requirements outlined in the admissions policy sections of each relevant degree program.

M.B.A./M.S.I.E. Dual Degree

The M.B.A./M.S.I.E. program consists of 69 credits. Up to 9 of these credits may be waived on the basis of undergraduate course work, leaving a minimum requirement of 60 credits. Any waivers of

course work from the M.B.A. side of the curriculum must meet the waiver guidelines of the M.B.A. program. Waivers must be approved in writing by the appropriate department and are contingent upon subsequent academic performance. Graduate credit may be transferred from other accredited institutions subject to Graduate School policy on transfer credit detailed elsewhere in this catalog.

The residency requirement for the two degrees shall be 60 credits completed at the University of New Haven.

Project/Thesis Requirement

Students in the dual degree program must complete the business administration capstone course MG 669 Strategic Management. In addition, they must complete an industrial engineering special project or thesis within the elective portion of the program. The special project requirement may be satisfied by taking a project course in a group setting, when offered. A designated area of study may be indicated for each industrial engineering project course; the instructor will offer direction and assist students in the development of substantial individual projects. Particular requirements or prerequisites may be set for the course. With special approval, a student may take an individual research project courses or write a thesis (as listed in the catalog).

Business Core Courses (waivable)*

A	620	Financial Accounting for Managers
EC	601	Macroeconomics and Microeconomics
FI	601	Finance
MG	637	Management Process
MK	609	Marketing

Advanced Business Courses (not waivable)

A	621	Managerial Accounting
FI	602	Corporate Valuation and Strategy
IB	644	Managing in Global Markets
MG	645	Management of Human Resources
EC	629	Business and Society
MG	669	Strategic Management

Industrial Engineering Courses**

IE	601	Introduction to Operations Research/Management Science
IE	607	Probability Theory
IE	609	Descriptive and Inferential Statistics
IE	623	Decision Analysis
IE	624	Quality Analysis
IE	651	Human Engineering I
IE	655	Manufacturing Analysis
IE	681	System Simulation
IE	688	Design of Experiments
IE	686	Production and Inventory Analysis

Approved IE Electives (two courses, including IE thesis/project)

*Up to three business core courses (9 credits) may be waived by students who meet the waiver guidelines established within the M.B.A. program.

**For waivers or substitutions of the IE courses see the program coordinator.

Mechanical Engineering

Coordinator: Stephen Ross, Professor, Ph.D., Johns Hopkins University

This program is intended to meet the needs of recently graduated mechanical engineering students and professionally employed engineers. Its purpose is to increase competence in modern analysis and synthesis techniques as they apply to engineering design.

The program centers on a core sequence, which all students are expected to take. The core courses contain advanced methods of analysis and design that are of common interest in engineering work. Students complete the program by electing a series of courses in mechanical engineering particularly suited to their current professional interests. Early in the program, students prepare, with the approval of the program coordinator, a detailed plan ensuring an overall educational experience that is integrated and logical.

Decisions regarding both core and elective requirements are subject to final approval by the program coordinator.

Admission Policy

Candidates for admission to the master's program are expected to have a grade point average of B or better in their undergraduate course work and to hold a bachelor's degree in mechanical engineering from a program accredited by the Accreditation Board for Engineering and Technology, or demonstrated equivalent. In some cases, applicants with a bachelor's degree in a field closely related to mechanical engineering may be considered for admission.

Students accepted on a provisional basis may be required to complete certain additional undergraduate mechanical engineering courses prior to enrolling in the graduate courses. It is strongly recommended that applicants submit scores from the Graduate Record Examination (GRE). Two letters of recommendation from individuals familiar with the applicant's potential for graduate study are also required. Additional admission requirements for international students may apply.

M.S.M.E.

A minimum of 33 credits must be completed to earn the master of science degree in mechanical engineering. Depending on a student's academic background, one of the five required courses may be waived.

Transfer of credit from other institutions is subject to Graduate School policy on transfer credit. A thesis is optional but highly recommended for students wishing to study particular areas of interest under the guidance of a faculty member. Thesis topics should be approved by the program coordinator when the student has completed 18 graduate credits. Thesis preparation and submission must comply with Graduate School policy on theses as well as with specific departmental requirements.

If a thesis is not chosen, and unless a special project approved by the graduate program coordinator is completed within the scope of other mechanical engineering courses, a student will be required to take the ME 690 Research Project course or ME 695/696 Independant Study I and II, supervised by a faculty member. Projects completed within courses may also serve to satisfy this requirement.

Required Courses

ME 602	Mechanical Engineering Analysis
ME 610	Advanced Dynamics
ME 615	Theory of Elasticity
ME 620	Classical Thermodynamics
ME 630	Advanced Fluid Mechanics

Electives

ME 604	Numerical Techniques in Mechanical Engineering
ME 605	Finite Element Methods in Engineering
ME 611	System Vibrations
ME 613	Fundamentals of Acoustics
ME 625	Mechanics of Continua
ME 627	Computer-Aided Engineering
ME 632	Advanced Heat Transfer
ME 635	Dynamic Systems and Control
ME 645	Computational Fluid Dynamics and Heat Transfer
ME 655	Interfacing Mechanical Devices
ME 670	Selected Topics
ME 690	Research Project
ME 695/696	Independent Study I and II
ME 698/699	Thesis I and II

With the coordinator's written approval, one required course may be waived depending on the student's academic background.

(With the coordinator's written approval, three elective courses may be chosen from other non-ME courses related to engineering or physical sciences.)

MS, Network Systems

Coordinators:

Graduate Advisor: Barun Chandra, Associate Professor of Computer Science, Ph.D., University of Chicago.

Graduate Admissions Coordinator: Tahany Fergany, Professor of Computer Science, Ph.D., University of Connecticut.

A graduate of this program will be equipped with the demonstrated, practical knowledge to rapidly become a productive employee for the setup, config-

uration and maintenance of small to large-scale networks. This includes the definition, configuration, and maintenance of network infrastructures as well as the assurance of their integrity in the face of ever-growing threats. These skills will be further augmented by the practical experience in diagnosis and process improvement gained through the application of principles in the classroom.

Admission Policy

This program is designed to accommodate students with no prior programming experience as well as those who already hold on undergraduate degree in computer science. All applicants will be expected to demonstrate that they have completed a baccalaureate degree and a course in basic algebra prior to enrolling in the program. Submission of GRE scores is not required.

Students coming in with an adequate background in Computer Science have to complete 30 credit hours of coursework consisting of 21 credit hours of required courses and 9 credit hours of electives. In addition, within these 30 credit hours of coursework, students must satisfy a project requirement.

The program curriculum is being updated consistantly. The most current version of the program can be obtained from either one of the graduate coordinators.

Prerequisite Knowledge

Before taking the required courses, students must demonstrate to the Graduate Admissions Coordinator that they have working knowledge of basic programming, software and hardware, equivalent to what is taught in the following courses:

CS	604	Introduction to Programming / C
CS	610	Intermediate Programming / C
CS	640	Computer Organization
CS	644	Operating Systems

Students with deficiencies in these areas will be required to take one or more of courses listed above, in addition to the regular courses for the MS Network Systems degree.

Required Courses (21 credits)

CS	634	Cryptography and Data Security
CS	642	Computer Networks and Data Communication
CS	645	Network Administration
CS	646	Introduction to Computer Security
CS	646B	Topics in Computer Security
CS	649	Network Analysis
CS	652	Script Programming for Network Administration

Electives (9 credits)

Students may choose three courses from the following:

CS 690 Project
Any Computer Science Restricted Electives from the list in the description of the M.S. Computer Science program.

Project Requirement

There are two different ways to satisfy the project requirement: (1) by extending and completing a significant project begun within a regular course, or (2) by conpleting a separate 690 Project course.

If a student is doing a project within a course, no additional tuition payment is due for that project and no additional credit is given for it. The instructor for the project course must agree, at the beginning of the trimester, to accept the project in fulfillment of degree requirements.

If a student is doing the 690 Project course, it will count as an elective course in addition to satisfying the project requirement. Students who plan to do the 690 Project must find a project advisor, prepare a project proposal and obtain written approval for the project prior to registration.

Total credits: 30

Graduate Certificates

The Tagliatela College of Engineering offers the following graduate certificates as options for those having a baccalaureate degree, or a master's degree, who want to enroll in a part-time, short, coherent

course of study at the graduate level. Those who may not yet be ready to commit to a full-length graduate program, as well as those who already hold a graduate degree but want to pursue additional work in the same or another field, may find that a certificate provides the perfect alternative.

Students applying to the Graduate School to enter a graduate certificate program must complete the Graduate School application form and submit official transcripts showing completion of the undergraduate/baccalaureate degree and two letters of recommendation. Each certificate program requires four courses (12 credits).

See the Table of Contents for the Academic Policies section of the catalog to find a complete description of the options, regulations, and requirements for study and completion of a graduate certificate.

Civil Engineering Design Certificate

Advisor: Agamemnon D. Koutsospyrous, Professor, PhD, Polytechnic University

This certificate provides professional studies beyond the baccalaureate level in the major disciplines within civil engineering. The student, with the advisor, selects courses that best satisfy the student's professional interests. Areas of specialization include water resources and environmental engineering.

Candidates for admission will be expected to have an engineering degree from a program accredited by the Accreditation Board for Engineering and Technology, or demonstrated equivalent. Engineering degrees presented from foreign institutions will be evaluated individually. Candidates are required to complete four courses or a total of 12 credits for the certificate. Courses must be selected, with the advisor's approval, from the following:

CE	615	Groundwater Hydrology
CE	620	Engineering Hydrology
CE	621	Advanced Hydrology
CE	623	Open Channel Hydraulics
CE	624	Computer Applications in Hydrology/Hydraulics
CE	629	Wood Engineering I
CE	630	Reinforced Concrete Design
CE	631	Structural Steel Design
CE	633	Wood Engineering II
CE	634	Prestressed Concrete Design
CE	640	Structural Analysis
CE	650	Soil Mechanics I
CE	651	Soil Mechanics II
CE	652	Foundation Engineering I
CE	653	Foundation Engineering II
CE	660	Project Planning
CE	678	Computer Applications in Civil Engineering

Computer Programming Certificate

Coordinators

Graduate Advisor: Barun Chandra, Associate Professor, Ph.D., University of Chicago

Graduate Admissions Coordinator: Tahany Fergany, Professor, Ph.D., University of Connecticut

CS	610	Intermediate Programming/C
CS	620	Data Structures

Plus one of the following:

CS	617	Java Programming
CS	623	Rapid Software Development/ Visual Basic
CS	626	Object-Oriented Principles and Practice/C++

Plus one of the following:

CS	617	Java Programming
CS	623	Rapid Software Development/ Visual Basic
CS	626	Object-Oriented Principles and Practice/C++
CS	647	Systems Programming
CS	652	Script Programming for Network Administration

Lean/Six Sigma Certificate

Advisor: Alexis N. Sommers, Professor, Ph.D., Purdue University

Lean approaches to production, operations, and processes translate to improved quality, shorter lead-time, and lower cost. Lean is needed for survival in the

current global marketplace, and to become competitive means to become Lean. This certificate is designed for professionals who wish to learn about the latest in the concepts of Lean/Six Sigma and the techniques that are used to implement Lean in an organization, whether it be service, manufacturing, or any other area. Four courses (12 credits) are required for this certificate, as listed below. Applicants are expected to have a background in statistics. The certificate academic advisor may allow substitutions to best meet the professional needs of the students. The courses taken for this certificate are applicable toward the M.S. degree in industrial engineering.

EM	604	Concepts of Engineering and Quality Management
EM	627	Value Engineering and Design
EM	628	Six Sigma Quality Planning
EM	639	Achieving Optimal Operations

Logistics Certificate

Advisor: Alexis N. Sommers, Professor, Ph.D., Purdue University

This 12-credit certificate provides a working knowledge of logistics, and it gives students a background for certification in one of the professional societies serving the discipline. Although an old field of study historically associated with the military, logistics has emerged as a key element in world commerce, including e-commerce and integrated manufacturing.

Modern logistics makes sure that needs are met on demanding timetables, creating effective customer supply chains that reach around the globe, and effective customer support mechanisms that keep people and machines working productively under both benign and hostile environmental conditions. From Mexican product assembly centers to Pacific Rim manufacturers, from New York copier repair technicians to engineers repairing rigs in the North Sea, logistics systems function to get the job done right, on time, and at lowest cost.

Logistics involves product planning, synchronous manufacturing, quality assurance, life-cycle cost analysis, transportation and distribution ERP and JIT, CRM and MRO, and the deployment of educated and experienced logisticians. World-class corporations as well as government agencies and military units require well-designed, effective, efficient logistics systems to achieve their goals and objectives. Career professionals generally acquire a certificate in logistics or a specialized graduate degree.

LG	660	Logistics Technology and Management

Plus three of the following:

IE	615	Transportation and Distribution
LG	663	Logistics in Acquisition and Manufacturing
LG	665	Integrated Logistics Support Analysis
LG	669	Life-Cycle Cost Analysis

Other logistics-related courses may be substituted with the approval of the certificate advisor.

Quality Engineering Certificate

Advisor: Alexis N. Sommers, Professor, Ph.D., Purdue University

This 12-credit certificate provides professionals who are interested in advancing their knowledge and skills with the most up-to-date analytic techniques and standards in the areas of quality assurance and control, reliability engineering, and experimental design. The program provides a solid foundation in probability and statistical methods, followed by specialized courses in quality, including the ISO standards; in reliability, including reliability algorithms and models; and in experimental design, including factorial and Taguchi methods. The courses taken for this certificate are applicable toward the M.S. degree in industrial engineering.

IE	607	Probability Theory
IE	609	Descriptive and Inferential Statistics
IE	624	Quality Analysis

Plus one of the following:

IE	643	Reliability and Maintainability
IE	688	Design of Experiments

HENRY C. LEE COLLEGE OF CRIMINAL JUSTICE AND FORENSIC SCIENCES

Richard H. Ward, D.Crim., Dean
William M. Norton, Ph.D., J.D., Associate Dean
Mario Gaboury, Ph.D., J.D., Associate Dean

Through the Graduate School, the Henry C. Lee College of Criminal Justice and Forensic Sciences offers career-oriented graduate degree programs in criminal justice, fire science, forensic science (including the criminalistics laboratory program), and national security and public safety. In addition, graduate certificates are available in specialized areas within the same fields of study for students seeking shorter, more focused programs of study.

Broad professional education is provided, often integrating classroom learning with laboratory and field experience. The programs attract students of varied ages and levels of expertise, from individuals new to the field to seasoned professionals seeking national or regional accreditation and licensure.

The Henry C. Lee College of Criminal Justice and Forensic Sciences is divided into three academic departments: of Criminal Justice, Forensic Science, and Fire Science and Professional Studies.

In addition to the graduate programs at the main campus in West Haven, the university is authorized to offer its master of science degrees in national security and public safety at its New Mexico location at the Kirtland Air Force Base in Albuquerque. Graduate certificates in these two areas, plus a certificate in forensic computer investigation, are also available at the New Mexico site.

Criminal Justice

Coordinator: James J. Cassidy, Ph.D., Hahnemann University; J.D., Villanova University

A key objective of the master of science in criminal justice program is to educate men and women who plan to seek careers in the field of criminal justice. Another objective is to provide the advanced training and education for those who staff the agencies and institutions of the criminal justice system. The program stresses a broad understanding of the social and behavioral sciences, the institutions of the criminal justice system, and the development of methodological tools and skills.

Courses in the area of social and behavioral science stress theories of the behavior of man in a social order and the sanctions imposed by different societies to control the social behavior of their members. Courses in the area of criminal justice institutions stress the study of the existing system from the police through the courts, the penitentiaries, and the system of probation and parole. The methodological courses expose students to the tools of research and analysis and the contribution of systems analysis to the efficient administration of the criminal justice system.

M.S., Criminal Justice

A total of 36 credits is required for the degree of master of science in criminal justice. Some students are required to complete an additional three credits (frequently CJ 610 Administration of Justice) if the graduate advisor finds that they do not have an adequate background in criminal justice. All degree candidates must complete the core curriculum. After consultation with an advisor, students select electives from a list of approved courses.

Applicants are required to take the Graduate Records Exam (GRE) General Test and submit their scores to Graduate Admissions. The transfer of credit from other institutions is permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog.

Thesis or Comprehensive Examination

Students may elect to undertake a thesis project in partial fulfillment of the requirements for the degree. Registration for a minimum of six thesis credits (CJ 697 and CJ 698) would be required. The thesis must show ability to organize materials in a clear and original manner and to present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as specific departmental requirements. Detailed information is available from the student's advisor.

Students who do not elect to undertake thesis work must pass a comprehensive final examination. This examination may be oral, written, or both, and is based on the program of study that the student has completed for the degree. Additional information about the comprehensive examination is available from the student's advisor.

General Program (No Concentration)

CJ	601	Mental Health, Law, and Criminal Justice
CJ	605	Theories of Criminal Behavior
CJ	611	Research Methods in Criminal Justice
CJ	613	Quantitative Analysis in Criminal Justice

Approved Electives (eight courses)

As an alternative to the general program, a student may select one of the following a concentration. However, all students must complete the four core classes listed above. CJ 601 and CJ 611 are offered in the fall term, and CJ 605 and CJ 613 in the winter term, each academic year.

Concentrations

Students may choose a more specialized program of study by selecting a concentration in forensic psychology, criminal justice management, forensic computer investigation, crime analysis, or victimology. In addition to these concentrations, students may elect to complete one of the graduate certificate programs available in criminal justice, forensic science, or fire science.

Concentration in Crime Analysis

The concentration in crime analysis prepares students for careers with police, private, and justice system organizations that utilize crime analysis in their management and decision-making functions. The program focuses on understanding and analyzing patterns of crime and violence to enable agencies to better respond to public safety issues and problems.

CJ	601	Mental Health, Law, and Criminal Justice
CJ	605	Theories of Criminal Behavior
CJ	611	Research Methods in Criminal Justice
CJ	613	Quantitative Analysis in Criminal Justice

Concentration Courses

CJ	655	Crime Prevention Through Environmental Design
CJ	656	Problem-Oriented Policing
CJ	657	Crime Mapping and Analysis
CJ	690	Research Project in Criminal Justice
E	659	Writing and Speaking for Professionals
EN	640	Introduction to Geographical Information Systems

Restricted Electives—two courses (six credits)

Concentration in Criminal Justice Management

This concentration is for those wishing to pursue a career in the management of a criminal justice agency. Courses are offered jointly by the criminal justice and public administration programs.

CJ	601	Mental Health, Law, and Criminal Justice
CJ	605	Theories of Criminal Behavior
CJ	611	Research Methods in Criminal Justice
CJ	613	Quantitative Analysis in Criminal Justice

Concentration Courses

CJ	612	Criminal Justice Management
CJ	637	Criminal Justice Policy

PA	602	Public Policy Formulation and Implementation
		or
PA	620	Personnel Administration and Collective Bargaining in the Public Sector
PA	630	Fiscal Management for Local Government
		or
PA	632	Public Finance and Budgeting

Approved Electives (four courses)

Concentration in Forensic Computer Investigation

This concentration is for those who wish to enhance their knowledge and prepare for careers in computer and electronic investigation areas within federal, state, or local governmental or corporate organizations.

CJ	601	Mental Health, Law, and Criminal Justice
CJ	605	Theories of Criminal Behavior
CJ	611	Research Methods in Criminal Justice
CJ	613	Quantitative Analysis in Criminal Justice

Concentration Courses

CJ	600	Computer Crime: Legal Issues and Investigative Procedures
CJ	603	Internet Vulnerabilities and Criminal Activity
CJ	604	Network Security, Data Protection, and Telecommunication

Restricted Electives

Five of the following:

CJ	606	Domestic and Sexual Violence
CJ	608	Law and Evidence
FOR	614	Survey of Forensic Science
FOR	616	Advanced Crime Scene Investigation
FOR	632	Advanced Investigation I
FOR	633	Advanced Investigation II
CJ	651	Criminal Procedure
CJ	657	Crime Mapping and Analysis

Concentration in Forensic Psychology

This program, offered jointly by the departments of criminal justice and psychology, is for those currently working in the justice system, or those planning such a career, who are interested in how psychology and law interact in the administration of justice.

CJ	601	Mental Health, Law, and Criminal Justice
CJ	605	Theories of Criminal Behavior
CJ	611	Research Methods in Criminal Justice
CJ	613	Quantitative Analysis in Criminal Justice

Concentration Courses

CJ	623	Mental Health Law
CJ	646/P 656	Abnormal Psychology in Forensic Settings
CJ	647/P 657	Forensic Assessment
CJ	648/P 658	Forensic Treatment Models
P	629	Introduction to Psychotherapy and Counseling

Approved Free Electives (9 credits)

Concentration in Victimology

This concentration provides students with an interdisciplinary, practice-oriented program. It prepares them for entry into a wide variety of positions in law enforcement, criminal justice, the courts, corrections, and victim services programs, as well as professional settings involving work with victims of crime, their families, and the community at large. The curriculum encourages a broad-based training experience focusing on the enhancement of the appropriate involvement of victims in the justice system and the provision of services to victims and survivors.

CJ	601	Mental Health, Law, and Criminal Justice
CJ	605	Theories of Criminal Behavior
CJ	611	Research Methods in Criminal Justice
CJ	613	Quantitative Analysis in Criminal Justice

Concentration Courses

CJ	606	Domestic and Sexual Violence
CJ	617	Advanced Victimology
CJ	618	Crime Victims' Rights and Services

Approved Electives (five courses)

Fire Science

Director: Sorin Iliescu, Assistant Professor, M.S., University of New Haven; Ed.D. Johnson & Wales University

Fire science is an interdisciplinary master's program designed to provide an advanced technical background for fire service, fire safety, occupational safety, and security professionals who are involved with fire protection and investigation. Fire protection specialists require knowledge of the science and methodology for preserving lives and property by preventing or minimizing losses resulting from fires, explosions, accidents, and related hazards. Current national data indicate that trained fire protection specialists are in extremely limited supply. Initial job opportunities in the insurance field, industry, and government service may involve applications in engineering, research and product design, building and systems design, fire hazard analysis, marketing of equipment, or insurance. The fire science program and courses cover a wide range of topics including the proper design, arrangement, and use of building materials; analysis of fire and explosion hazards; safe design of industrial processes; management of property loss control and insurance programs; investigation of fires; management in the public sector; and safe design, selection, and handling of equipment and materials. Updated skills are provided in the application of fire protection principles to fire department, water supply, and building code aspects of community planning.

M.S., Fire Science

Candidates are required to complete a minimum of 39 credits of graduate work, which may include an internship in fire science. Transfer credit from other institutions may be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog. Students in the fire science degree program are required to complete the core courses; a concentration in fire administration, fire/arson investigation, or public safety management; and 18 credits of electives. Students must take either FS 690 Research Seminar or FS 693 Internship.

Required Courses

FS	625	Chemistry of Fires and Explosions
FS	669	Dynamics, Evaluation, and Prevention of Structural Fires
FS	690	Research Project
		or
FS	693	Internship

Concentration (12–13 credits)
Approved Electives (18 credits)

Concentration in Fire Administration

This concentration requires 12 credits as follows:

One Computer Science (CS) Elective

MG	637	Management Process

Two Public Administration (PA) Electives

Concentration in Fire/Arson Investigation

This concentration requires 13 credits as follows:

FOR	614	Survey of Forensic Science
FS	649	Fire Scene Investigation and Arson Analysis (4 credits)
FS	650	Arson for Profit
FS	665	Legal Aspects of Fire/Arson Investigation

Concentration in Public Safety Management

This concentration requires 12 credits as follows:

FS	631	Organization and Management of Public Fire Protection
FS	632	Strategic Planning for the Fire Service
FS	633	Issues in Public Safety Professional Responsibility
FS	634	Issues in Public Safety Management

Approved Fire Science Elective Courses

FS	649	Fire Scene Investigation and Arson Analysis (4 credits)
FS	650	Arson for Profit
FS	661	Systems Approach to Fire Safety
FS	663	Fire Protection Systems Application
FS	664	Terrorism
FS	665	Legal Aspects of Fire/Arson Investigation
FS	666	Industrial Fire Protection
FS	667	Fire and Building Codes, Standards, and Practices
FS	668	Fire and Casualty Insurance Practices
FS	684	Fire Scene Reconstruction

In addition to those listed above, courses from other departments may be taken as electives with the consent of the program director.

See the Table of Contents for the certificates in fire science and public safety management.

Forensic Science

Director: Virginia M. Maxwell, Associate Professor, D.Phil., Oxford University

Forensic science is a broad, interdisciplinary field in which the natural sciences are employed to analyze and evaluate physical evidence in matters of the law. The interdisciplinary forensic science program has three concentrations: criminalistics, fire science, and advanced investigation. In addition to the M.S. degree programs, professional certificates are offered in all the specialties for those who want certification in a second track. The criminalistics concentration provides an advanced technical background for those wishing to enter the criminalistics field as professional laboratory examiners. The fire science concentration provides advanced training in arson scene investigation, laboratory analysis of arson-related evidence, and related aspects of arson and fire investigation. The advanced investigation concentration provides advanced training in forensic sciences and in investigation techniques and is designed for students interested in applying forensic science to investigations, forensic identification, crime scene processing, and related work.

The program and courses stress not only up-to-date analytical and scientific methods but also a broad understanding of the concepts underlying the forensic sciences. Degree programs in forensic science require a sequence of core courses, followed by concentration courses, and a flexible offering of electives designed to meet individual interests. Degree requirements can be fulfilled in five trimesters.

Admission Policy

Because admissions criteria differ, at the time of initial application students must specify which concentration they plan to pursue. Students who later decide to change concentrations may be required to re-apply.

For admission to the criminalistics concentration, students must have an undergraduate degree in a natural science (chemistry, biology, or physics) or forensic science from an accredited institution. Applicants should have taken at least one year of general chemistry with lab, one year of organic chemistry with lab, and one semester of instrumental analysis or analytical chemistry with lab. A semester of biochemistry with lab and a year of physics with lab are highly recommended.

For criminalistics concentration applicants planning to pursue forensic biology, recommended undergraduate course work includes biochemistry, genetics, molecular biology, statistics, and population genetics, or other subjects that provide foundation knowledge for forensic DNA analysis. Applications are strengthened by an overall undergraduate average of at least 3.0 (on a 4.0 scale) and grades of B or better in science and mathematics courses. Applicants for the criminalistics concentration are required to take the Graduate Record Examination (GRE) General Test and submit their scores to Graduate Admissions as part of their application. Applications are strengthened by verbal scores falling at or above the 50th percentile and by quantitative/analytical scores falling at or above the 70th percentile.

For admission to the advanced investigation or fire science concentration students must have earned a baccalaureate degree from an accredited institution. The degree need not be in the natural sciences, and the GRE is not required. Applications arestrengthened by natural science course work and by an overall undergraduate average of at least 3.0 (on a 4.0 scale). It is highly recommended that students have undertaken at least one year of a natural science as part of their degree.

Applications must be accompanied by two letters of recommendation. Letters should come from persons familiar with the applicant's academic skills, performance, and promise. Typically, such recommenders are current or former professors and/or employers. Applications should be accompanied by a short (no more than one page) statement that addresses the basis of the applicant's interest in forensic science as well as personal and professional goals and how completion of this degree program is expected to further those goals.

Admission to the forensic science program isgranted for the fall trimester only. The application deadline for the forensic science program is March 1 for the following fall trimester. Applicants may expect an admissions decision about the middle of March in the year for which they have applied.

M.S., Forensic Science

Candidates are required to complete 40 credits of graduate work over a period of five trimesters. Transfer of credit from other institutions may be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog. At the time of application to the forensic science program, applicants must specify area of concentration.

Thesis

Students may elect to write a thesis in lieu of FOR 686 Forensic Science Research Project I/FOR 688 Forensic Science Internship I and three credits of electives. Registration for a minimum of six thesis credits (FOR 697, FOR 698) would be required. The thesis must show an ability to organize material in a clear and original manner and to present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as specific departmental requirements.

Required Courses

FOR 614	Survey of Forensic Science
FOR 620	Advanced Criminalistics I
FOR 640	Advanced Criminalistics II
FOR 653	Physical Analysis in Forensic Science
FOR 686	Forensic Science Research Project I
	or
FOR 688	Forensic Science Internship I

Plus required concentration courses (see next page)

Electives

CJ 600	Computer Crime: Legal Issues and Investigative Procedures
CJ 602	Computers, Technology, and National Security Information Management Systems
CJ 603	Internet Vulnerabilities and Criminal Activity
CJ 604	Network Security, Data Protection, and Telecommunication
CJ 606	Domestic and Sexual Violence
CJ 607	Psychological Applications in Criminal Justice
CJ 608	Law and Evidence
CJ 610	Administration of Justice
FOR 645	Drug Chemistry and Identification
FOR 670	Selected Topics
FOR 695	Independent Study
SH 602	Safety Organizations and Administration
SH 620	Occupational Safety and Health Law

In addition, other concentration courses (in lists from which one, two, or more must be taken) may fulfill elective requirements. Courses listed as requirements for one of the concentrations may be taken as electives for other concentrations with the permission of the student's faculty advisor.

Concentration in Advanced Investigation

FOR 616	Advanced Crime Scene Investigation

FOR 632 Advanced Investigation I
FOR 633 Advanced Investigation II
FOR 661 Medicolegal Investigation and Identification

Plus one of the following:

CJ 608 Law and Evidence
CJ 651 Criminal Procedure
CJ 652 Sexual Offenders and Predators
PS 605 Criminal Law

Electives (10 credits)

Concentration in Criminalistics

FOR 621 Advanced Criminalistics I Laboratory (1 credit)
FOR 641 Advanced Criminalistics II Laboratory (1 credit)
FOR 654 Physical Analysis in Forensic Science Laboratory (1 credit)
FOR 673 Biomedical Methods in Forensic Science
FOR 674 Biomedical Methods in Forensic Science Laboratory (1 credit)

Plus two of the following:

CH 621 Chemical Forensic Analysis with Laboratory (4 credits)
CH 631 Advances in Analytic Chemistry
FOR 645 Drug Chemistry and Identification
FOR 660 Forensic Microscopy (4 credits)
FOR 661 Medicolegal Investigation and Identification
FOR 662 Forensic Toxicology (4 credits)
FOR 663 Advanced Forensic Serology I
FOR 664 Advanced Forensic Serology II

Electives (10–12 credits)

Concentration in Fire Science

FOR 625 Chemistry of Fires and Explosions
CJ 649 Fire Scene Investigation and Arson Analysis (4 credits)
CJ 608 Law and Evidence
or
CJ 651 Criminal Procedure
or
FS 665 Legal Aspects of Fire and Arson Investigation
or
PS 605 Criminal Law

Plus one of the following:

CJ 667 Fire and Building Codes, Standards, and Practices
CJ 668 Fire and Casualty Insurance Practices
CJ 669 Dynamics, Evaluation, and Prevention of Structural Fires
CJ 684 Fire Scene Reconstruction

See Table of Contents for certificates in forensic science.

Electives (12 credits)

National Security and Public Safety

Director: William L. Tafoya, Ph.D., University of Maryland

The National Security and Public Safety program is the result of the collaborative efforts of the Criminal Justice and Political Science departments at the University of New Haven. The program is administered by the Dean's Office of the Henry C. Lee College of Criminal Justice and Forensic Sciences and operates at our main campus in West Haven, Connecticut, as well as being hosted by Sandia National Laboratory in Albuquerque, New Mexico. Students applying to the program should designate the campus to which they are applying. Only employees of Sandia are eligible to matriculate at that campus.

This program provides students with an understanding of the fundamental principles of National Security. This includes the legal charter, presidential executive orders, and the framework that guides the operation of national security agencies.

Specifically, the role and function of the U.S. agencies that make up the intelligence community are analyzed, emphasizing information protection and security.

The concentration in information protection and Security provides a unique approach to the study of

both cybersecurity and the protection of information systems within the intelligence community. Research issues in public safety, emergency management, and homeland security are emphasized.

Finally, corporate security and its new relationship to the role of homeland and national security compose a rich element of research inquiry.

M.S., National Security and Public Safety

Candidates are required to complete a minimum of 36 credits of graduate work, which may include an internship in national security. Transfer credit from other institutions may be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog.

Students in the program are required to complete 15 credits of core courses, 9 credits of restricted electives and 12 credits of general electives with advisor approval. Students must complete a capstone requirement of either NSP 690 Research Project or NSP 693 National Security Internship as part of the program; or NSP 697, NSP 698, NSP 699 Thesis.

Required Courses (15 Credits)

NSP 601	National Security Programs: Architecture and Mission
NSP 602	Personnel Security Programs
NSP 603	National Security Charter, Legal Issues, and Executive Orders
NSP 604	Securing National Security Information Systems
NSP 690	Research Project I
	or
NSP 693	National Security Internship I
	or
NSP 697	Thesis I
NSP 698	Thesis II

If thesis option is selected, 3 credits will count toward electives.

Plus 21 credits of electives chosen with Dean's approval from the following:

Electives

CJ 602	Computers, Technology, and National Security Information Management Systems
NSP 606	Contemporary Issues in National Security Programs
NSP 607	Architecture of Protected Information
NSP 610	NSP Cost Modeling and Contract Administration
NSP 611	NSP Situational Evaluation and Failure Analysis Models
NSP 612	Integrated Studies in Safeguards and Countermeasure Designs
NSP 613	NSP Issues in Research and Policy Analysis
NSP 620	Bioterrorism and Biodefense
NSP 621	NS Incident Mapping
NSP 630	Risk Assessment and Management in National Security
NSP 641	NS World and National Threat Modeling
NSP 642	Integrated Studies of the Intelligence and Counterintelligence Communities
NSP 643	Seminar in Sensitive Evaluation Techniques, Safeguards, and Countermeasures
NSP 644	Cross-Impact Analysis: National Security Futures Issues
NSP 645	National Security Issues in Deception
NSP 646	The Structure of National Security Decisions
NSP 647	The Economics of National Security Administration
NSP 648	Achieving Excellence in National Security Futures Issues
NSP 651	A Study of Designated Approving Authorities Criteria
NSP 652	System Administration in Information Systems Security
NSP 653	Information Systems Security Officers

NSP 654	Information System Approval and Certification
NSP 668	Weapons of Mass Destruction I: Chemical and Biological Agents
NSP 669	Weapons of Mass Destruction II: Radiological Agents
NSP 691	Research Project II
NSP 694	National Security Internship I
NSP 695	Independent Study

Concentration in Information Protection and Security

This concentration provides a unique approach to the issue of cyberterrorism and the protection of information management systems within our national security agencies. Students will be prepared for the responsibilities of protecting agency or corporate information systems. The basics of information systems security as well as the legal issues and cyber-response strategies are reviewed. Computer gaming simulations as well as online attack and defense techniques are presented for student assignments.

NSP 601	National Security Programs: Architecture and Mission
NSP 602	Personnel Security Programs
NSP 603	National Security Charter, Legal Issues, and Executive Orders
NSP 604	Securing National Security Information Systems
NSP 690	Research Project I
	or
NSP 693	National Security Internship I
	or
NSP 697	Thesis I
NSP 698	Thesis II

Plus four of the following:

NSP 625/ CJ 625	Information Systems: Threats, Attacks, and Defenses
NSP 626/ CJ 626	Firewalls and Secure Enterprise Computing
NSP 627/ CJ 627	Internet and Audit-Based Computer Forensics
NSP 628/ CJ 628	Computer Viruses and Malicious Code
NSP 629/ CJ 629	Introduction to Practical Issues in Cryptography
CJ 680	Research Issues in Cyberterrorism

Plus three of electives chosen with dean's approval from the following:

NSP 607	Architecture of Protected Information
NSP 644	Cross-Impact Analysis: National Security Futures Issues
NSP 651	A Study of Designated Approving Authorities Criteria
NSP 652	System Administration in Information Systems Security
NSP 653	Information Systems Security Officers
NSP 654	Information System Approval and Certification

Graduate Certificates

The Henry C. Lee College of Criminal Justice and Forensic Sciences offers the following graduate certificates as options for persons having a baccalaureate degree, or a master's degree, who want to enroll in a part-time, short, coherent course of study at the graduate level. Persons who may not be ready to commit to a full-length graduate program, as well as those who already hold a graduate degree but want to pursue additional work in the same or another field, may find that a certificate provides the perfect alternative.

Students applying to the Graduate School to enter a graduate certificate program must complete the Graduate School application form and submit official transcripts showing completion of the undergraduate/baccalaureate degree and two letters of recommendation.

See the Academic Policies section of the catalog for a complete description of the options, regulations, and requirements for study and completion of a graduate certificate.

Criminal Justice Management Certificate

Advisor: Mario T. Gaboury, Professor, Ph.D., Pennsylvania State University; J.D., Georgetown University Law Center

The graduate certificate program in criminal justice management teaches specific skills to professionals in this field. Courses emphasize the application of modern management principles and practices to the field of criminal justice. The following four courses (12 credits), or substitutions approved by the advisor, are required for completion of this certificate.

CJ	612	Criminal Justice Management
CJ	656	Problem-Oriented Policing
CJ	658	Leadership Issues in Policing
CJ	659	Futures Research and Long-Range Planning and Forecasting in Criminal Justice

Fire/Arson Investigation Certificate

Advisor: Bruce Varga, M.S., University of New Haven

The certificate in fire/arson investigation is designed to assist professionals who wish to acquire specific skills in this specialized field. The following four courses (12–13 credits), or substitutions approved by the advisor, are required for completion of this certificate.

FS	625	Chemistry of Fires and Explosions
FS	649	Fire Scene Investigation and Arson Analysis (4 credits)
FS	650	Arson for Profit
FS	665	Legal Aspects of Fire/Arson Investigation

Fire Science Technology Certificate

Advisor: Sorin Iliescu, Assistant Professor, M.S., University of New Haven; Ed.D., Johnson & Wales University

The 12-credit certificate in fire science technology is designed to assist professionals who wish to acquire specific skills related to this specialized field. This certificate is appropriate for those in both the public and the private sectors who are involved in fire/life safety and property protection. The following four courses, or substitutions approved by the advisor, are required for completion of this certificate.

FS	625	Chemistry of Fires and Explosions
FS	666	Industrial Fire Protection
FS	667	Fire and Building Codes, Standards, and Practices
FS	669	Dynamics, Evaluation, and Prevention of Structural Fires

Forensic Computer Investigation Certificate

Advisor: William L. Tafoya, Ph.D., University of Maryland

This 12-credit certificate is designed for professionals who wish to enhance their knowledge and skills in forensic computer investigation. Courses are selected with the advisor to satisfy the student's professional interests.

CJ	600	Computer Crime: Legal Issues and Investigative Procedures
CJ	604	Network Security, Data Protection, and Telecommunication

Plus two of the following:

CJ	602	Computers, Technology, and National Security Information Management Systems
CJ	603	Internet Vulnerabilities and Criminal Activity
CJ	608	Law and Evidence
FOR	616	Advanced Crime Scene Investigation
FOR	632	Advanced Investigation I
FOR	633	Advanced Investigation II
CJ	651	Criminal Procedure
FOR	670	Selected Topics

Forensic Psychology Certificate

Advisor: James J. Cassidy, Associate Professor, Ph.D., Hahnemann University; J.D., Villanova University School of Law

This 12-credit program of study prepares those who will be responsible for the management and care of offenders in forensic settings. In addition, it is designed to enhance the knowledge and skills of pro-

fessionals currently working in law enforcement, courts, corrections, or mental health settings. The program is also intended to enhance the knowledge base of students in master's programs in community psychology and criminal justice. Prerequisites: CJ 601 and CJ 605 or equivalent.

CJ 623	Mental Health Law
CJ 646/P 656	Abnormal Psychology in Forensic Populations
CJ 647/P 657	Forensic Assessment
CJ 648/P 658	Forensic Treatment Models

Forensic Science/Advanced Investigation Certificate

Advisor: Virginia M. Maxwell, Associate Professor, D.Phil., Oxford University

This cretificate requires a total of 18 credits as follows:

FOR 614	Survey of Forensic Science
FOR 616	Advanced Crime Scene Investigation
FOR 632	Advanced Investigation I
FOR 633	Advanced Investigation II

Plus two of the following:

CJ 608	Law and Evidence
CJ 610	Administration of Justice
FOR 620	Advanced Criminalistics I
FOR 640	Advanced Criminalistics II
FOR 653	Physical Analysis in Forensic Science
FOR 661	Medicolegal Investigation and Identification
FOR 673	Biomedical Methods in Forensic Science
PS 605	Criminal Law

Forensic Science/Criminalistics Certificate

Advisor: Virginia M. Maxwell, Associate Professor, D.Phil., Oxford University

Admission to this certificate is limited. Please see advisor early. This cretificate requires 19–20 credits as follows:

FOR 620	Advanced Criminalistics I
FOR 621	Advanced Criminalistics I Laboratory (1 credit)
FOR 640	Advanced Criminalistics II
FOR 641	Advanced Criminalistics II Laboratory (1 credit)
FOR 653	Physical Analysis in Forensic Science
FOR 654	Physical Analysis in Forensic Science Laboratory (1 credit)
FOR 673	Biomedical Methods in Forensic Science
FOR 674	Biomedical Methods in Forensic Science Laboratory (1 credit)

Plus one of the following:

CH 621	Chemical Forensic Analysis with Laboratory (4 credits)
CH 631	Advances in Analytic Chemistry
CJ 610	Administration of Justice
FOR 614	Survey of Forensic Science
FOR 645	Drug Chemistry and Identification

Forensic Science/Fire Science Certificate

Advisor: Virginia M. Maxwell, Associate Professor, D.Phil., Oxford University

This cretificate requires a total of 19 credits as follows:

FOR 640	Advanced Criminalistics II
CJ 649	Fire Science Investigation and Arson Analysis (4 credits)
FOR 653	Physical Analysis in Forensic Science
FS 665	Legal Aspects of Fire and Arson Investigation

Plus two of the following:

CH 625	Chemistry of Fires and Explosions
FOR 614	Survey of Forensic Science
CJ 667	Fire and Building Codes, Standards, and Practices
CJ 668	Fire and Casualty Insurance Practices
CJ 669	Dynamics, Evaluation, and Prevention of Structural Fires
CJ 684	Fire Scene Reconstruction
CJ 693	Criminal Justice Internship I

Information Protection and Security Certificate

Advisor: William L. Tafoya, Ph.D., University of Maryland

This 12-credit certificate prepares individuals for the responsibilities of protecting agency or corporate information systems. The basics of information systems security as well as the legal issues and cyber-response strategies are reviewed. Computer gaming simulations as well as online attack and defense techniques are presented for student assignments. A selection of these certificate courses is offered online. Appropriate computer competency is assumed as a prerequisite to these courses.

CJ	625	Information Systems: Threats, Attacks, and Defense
CJ	626	Firewall and Secure Enterprise Computing

Plus two of the following, subject to approval of the advisor:

CJ	602	Computers, Technology, and National Security Information Management Systems
CJ	604	Network Security, Data Protection, and Telecommunication
CJ	608	Law and Evidence
CJ	627	Internet Investigations and Audit-Based Computer Forensics
CJ	628	Computer Viruses and Malicious Code
CJ	629	Practical Issues in Cryptography
CJ	651	Criminal Procedure

National Security Certificate

Advisor: William L. Tafoya, Ph.D., University of Maryland

For students who may not be ready to commit to a full-length graduate program, or for those who already hold a master's degree but wish to pursue additional work in the area of national security, this 12-credit graduate certificate provides an alternative. Application for the graduate certificate requires the dean's approval.

NSP 601	National Security Programs: Architecture and Mission
NSP 602	Personnel Security Programs
NSP 604	Securing National Security Information Systems
NSP 612	Integrated Studies in Safeguards and Countermeasure Designs

National Security Administration Certificate

Advisor: William L. Tafoya, Ph.D., University of Maryland

To achieve and sustain high performance during these challenging times, our national security enterprise requires focus, discipline, and imagination. It also requires thoughtful oversight, visionary leadership, and highly effective administration.

The purpose of the certificate in national security administration is to provide students and security professionals with the opportunity to expand their knowledge and administrative skills with the expectation that graduates of this program will meaningfully contribute to more focused risk management, wise decision-making, and effective administration within our national security enterprise. Requirements for this 12-credit certificate are as follows:

NSP 630	Risk Assessment and Management in National Security
NSP 646	The Structure of National Security Decisions
NSP 647	The Economics of National Security
NSP 648	Achieving Excellence in National Security Administration

National Security Technology Certificate

Advisor: William L. Tafoya, Ph.D., University of Maryland

The purpose of the certificate in national security technology is to provide students and security professionals with the opportunity to expand their knowledge and technology skills. Requirements for this 12-credit certificate are as follows:

NSP	603	National Security Charter, Legal Issues, and Executive Orders (3 credits)
NSP	620	Bioterrorism & Biodefense (1 credit)
NSP	621	National Security Incident Mapping (2 credits)
NSP	645	National Security: Issues in Deception (3 credits)
CJ	680	Research Issues in Cyberterrorism (3 credits)

Public Safety Management Certificate

Advisor: Sorin Iliescu, Assistant Professor, M.S., University of New Haven; Ed.D., Johnson & Wales University

This 12-credit certificate in public safety management is designed to assist professionals who wish to acquire specific skills related to this field. Courses emphasize the application of modern management principles and practices to the field of public safety. The following four courses, or substitutions approved by the advisor, are required for completion of this certificate.

FS	631	Organization and Management of Public Fire Protection
FS	632	Strategic Planning for the Fire Service
FS	633	Issues in Public Safety Professional Responsibility
FS	634	Issues in Public Safety Management

One of the following electives may be substituted for a required course above, with the approval of the advisor.

CO	631	Public Information Dynamics
EC	665	Urban and Regional Economic Development
FS	681	Seminar/Research Project in Public Safety Management I
FS	682	Seminar/Research Project in Public Safety Management II
FS	683	Seminar/Research Project on Comparative Public Safety Systems
PA	620	Personnel Administration and Collective Bargaining in the Public Sector
PA	630	Fiscal Management for Local Government
PS	635	Law and Public Health
SH	602	Safety Organization and Administration
SH	620	Occupational Safety and Health Law

Victim Advocacy and Service Management Certificate

Advisor: Mario T. Gaboury, Professor, Ph.D., Pennsylvania State University; J.D., Georgetown University Law Center

This 12-credit certificate is designed for professionals who work with crime victims. Students develop advanced knowledge and skill in working as victim advocates and victim services managers.

CJ	617	Advanced Victimology
CJ	618	Crime Victims' Rights and Services

Plus two of the following:

CJ	601	Mental Health, Law, and Criminal Justice
CJ	605	Theories of Criminal Behavior
CJ	606	Domestic and Sexual Violence
CJ	624	Group Process in Criminal Justice
P	605	Survey of Community Psychology
P	610	Program Evaluation
P	611	Individual Intervention Seminar
P	625	Life Span Developmental Psychology
P	628	The Interview
P	629	Introduction to Psychotherapy and Counseling
P	632	Group Treatment and Family Therapy
P	636	Abnormal Psychology
PA	601	Principles of Public Administration
PA	604	Communities and Social Change
PA	630	Fiscal Management for Local Government

COURSE DESCRIPTIONS

Course descriptions are arranged alphabetically by the course prefix code letters, as listed here. For the purpose of brevity, course descriptions may consist of sentence fragments. Unless otherwise specified, graduate courses carry three credits.

Accounting and Taxation

A 601 Federal Income Taxation I
A study of tax policy and the fundamental principles of the federal income tax law taught at an advanced level of inquiry. Coverage entails the key concepts of gross income, adjusted gross income, deductions, exemptions, credits, and special tax computations, with attention given to the provisions of the Internal Revenue Code affecting individual taxpayers.

A 602 Federal Income Taxation II
A continuation of Federal Income Taxation I emphasizing the fundamental principles concerning dispositions of property: analysis of basis, recognition of gain or loss, capital asset transactions, nonrecognition exchanges and depreciation recapture, inventory methods, changes in accounting periods, and accounting methods.

A 603 Tax Research and Writing
Tax research sources, techniques, practice, and writing. Use of web-based tax research services and evaluation of weights or authority, legislative history, and systematic written analysis of tax problems and legal memoranda. 2 credits.

A 604 Taxation of Business Entities
An introduction to the income tax consequences of the formation and operation of C corporations, S corporations, affiliated corporations, partnerships, and limited liability companies.

A 605 Partnership and Limited Liability Company Income Taxation
Prerequisite: A 604. A study of the federal income tax problems encountered in the operation of partnerships and limited liability companies, including partnership allocations, operating distributions, sale of partnership interest, withdrawal of a partner, death or retirement of a partner, distribution of partnership assets, and basis adjustments.

A 606 Corporate Income Taxation
Prerequisite: A 604 or undergraduate equivalent. Advanced study in the corporate tax area including corporate distributions, redemptions, liquidations, taxable acquisitions, carryover of corporate tax attributes, corporate reorganizations and divisions, intercompany transactions, and consolidated returns.

A 607 Qualified Retirement Plans
An examination of the fundamentals of the federal taxation of deferred compensation. The course focuses on qualified retirement plans and individual and self-employed retirement plans as developed by the Employment Retirement Income Security Act of 1974 and subsequent legislation. Deferred executive compensation arrangements, stock options, restricted property, tax-deferred annuities, and various employee benefit plans are also reviewed.

A 608 Taxation of Estates, Gifts, and Trusts
A comprehensive introduction to, and analysis of, the federal estate and gift tax laws including basic principles of estate planning. Coverage also includes federal income taxation of estates, trusts, grantors, and beneficiaries.

A 609 Federal Tax Practice and Procedure
A study of the history and organization of the Internal Revenue Service, the selection of returns for audit, and the review steps at the administrative level. Code provisions covered include filing requirements, statutory notices, restriction on assessment, statute of limitations, refund procedures, waivers, closing agreements, protests, and rulings.

A 610 International Taxation
Prerequisite: A 604. Consideration of the federal income tax treatment of nonresident aliens, foreign corporations, and the foreign income of U.S. residents and domestic corporations. Comparison of alternative methods of engaging in operations abroad, foreign tax credit, allocations under code Section 482, Section 367 rulings, and effects of tax treaties.

A 611 State and Local Taxation
A study of tax problems encountered at the state and local level by businesses engaged in interstate commerce. Federal limitations on the taxation of multistate enterprises and jurisdictional problems are examined. Specific areas covered are license to do business, net income, franchise, gross receipts, property, and sales and use taxes. Apportionment problems are examined in detail.

A 615 Research Project in Federal Income Taxation
Prerequisite: 15 graduate credits in taxation. A study of the techniques and tools of tax research. Reference sources include tax loose-leaf services, IRS cumulative bulletins, court cases, congressional committee reports, textbooks, and published articles. Research projects are assigned for written submission. 1 credit.

A 616 Taxation for Management
Introduction to federal taxation and its impact on business decision-making. Covers the basics of federal taxation, and its traps; tax planning for personal and business situations; and the interrelationship of tax-planning decisions. Areas of federal taxation covered are individual income taxes, corporation income taxes, S corporations, partner-

ships, income taxation of estates and trusts, and estate and gift taxes. Not open to M.S. in Taxation students.

A 620 Financial Accounting for Managers

An examination of financial accounting reports, standards, practices, and procedures from a user's perspective, emphasizing the understanding and use of accounting reports rather than their preparation. Basic terms, concepts, reports, and underlying theories are covered. A review of the effects of choosing certain accounting methods, policies, and procedures is intended to enhance the manager's comprehension of financial statement presentation.

A 621 Managerial Accounting

Prerequisite: A 620. Accounting analysis for the managerial functions of planning, controlling, and evaluating the performance of the business firm.

A 630 Topics in Corporate Financial Reporting

Prerequisite: A 620 or equivalent. A selected examination of corporate financial accounting topics including revenue recognition, current assets, investments, leases, pensions, earnings per share, foreign currency translation, and business combinations.

A 641 Accounting Information Systems

Prerequisite: A 621. An examination of the function and limitations of internal accounting information systems and their relationship to other decision-oriented business information systems.

A 642 Internal Auditing Seminar

Prerequisite: A 621. Analysis of the principles underlying the functions of auditing within a firm. The seminar imparts a working knowledge of techniques used in business audits.

A 650 Advanced Accounting Theory

Prerequisite: A 630 or six credits of intermediate accounting. Theoretical aspects of accepted accounting principles and their significance as a frame of reference for the valuation of accounting practices. Major focus on the role of regulatory agencies and professional accounting organizations with regard to their influences on accounting theory and practice.

A 652 Auditing and Assurance Services Seminar

An analysis of the contemporary problems surrounding the attest function performed by the professional independent auditor.

A 654 Financial Statements: Reporting and Analysis

Prerequisite: A 621. Techniques in analyzing financial statements by creditors and equity investors for the short and long term. Review of accounting principles as reflected in financial statements.

A 661 Managerial Accounting Seminar

Prerequisite: A 621. Case course covering advanced issues of management accounting. Develops topics introduced in A 621.

A 670 Selected Topics

A study of selected issues of particular interest to students and instructor. Course may be taken more than once.

A 690 Research Project

Prerequisite: 15 graduate credits or permission of the instructor. Independent study under the supervision of an advisor.

A 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

A 696 Independent Study II

A continuation of Independent Study I.

Arabic

AR 601 Elementary Arabic I

This course introduces students to the basic skills of reading, writing, speaking, and listening to modern standard Arabic. Students learn Arabic letters and sounds. They also learn to write and create words and sentences, and conduct basic conversations in the Arabic language.

AR 602 Elementary Arabic II

Prerequisite: AR 601 or permission of the instructor. This course builds upon the language, listening, and writing skills developed in AR 601. Students advance their knowledge of Arabic letters and sounds, words and sentences, and basic conversation skills.

AR 611 Intermediate Arabic I

Prerequisite: AR 102/602 or permission of the instructor. This course builds upon the skills acquired in the first-year course sequence. Emphasis is on mastering grammar, speaking, listening comprehension, and reading. Students gain the confidence to converse with native speakers on a variety of topics; they write simple texts on everyday themes and acquire the skills to read uncomplicated authentic texts, such as newspaper articles on familiar topics.

AR 612 Intermediate Arabic II

Prerequisites: AR 201 or 602 or permission of the instructor. This is a second-year, upper-intermediate course in Modern Standard Arabic (MSA), which continues to focus on the four skills of reading, writing, speaking, and listening. In this level, students gain oral proficiency and should become comfortable to converse on familiar topics with a native speaker,

to write short texts on everyday themes, and to read newspaper articles and short stories. Students are also introduced to aspects of contemporary life and culture in the Arab world through films and cultural video clips.

Biology

BI 605 Biostatistics

A non-calculus-based course that includes basic concepts of probability and statistics. These concepts are applied to problems in human biology, industrial/occupational health, and epidemiology. Introduction to and use of the computer package SPSSx for data analysis. (See also M 605.)

Civil and Environmental Engineering

CE 601 Physical-Chemical Treatment of Aqueous Wastes

Analysis of physical and chemical processes in natural and engineered systems for water pollution control. Unit processes covered include, but are not limited to, aeration and gas transfer, sedimentation, filtration, coagulation/flocculation, adsorption, chemical stabilization, ion exchange, and disinfection. Design methodologies and operational aspects of treatment are also considered.

CE 602 Biological Treatment of Aqueous Wastes

This course provides an in-depth study of principles of biological treatment of aquatic wastes (municipal, industrial, and/or hazardous). Suspended and attached growth processes commonly in use are covered. Emphasis is given to design and operational aspects of activated sludge, trickling filters, and rotating biocontactors. On-site treatment processes are also covered.

CE 603 Contaminant Fate and Transport in the Environment

This course covers the fundamental principles of contaminant behavior in the environment. Contaminant physical-chemical properties, transport, and transformation mechanisms affecting contaminant distribution among air, water, and solid domains are studied in depth. Topics covered include, but are not limited to, environmental interface equilibria; advective and diffusional transport; and biochemical exchange in atmospheric, aquatic, and terrestrial domains. Environmental modeling is also considered.

CE 605 Solid Waste Management

Characteristics, volumes, collection, and disposal of solid waste and refuse. Design of processing, recycling, and recovery equipment; landfill design and operation; resource recovery; incineration.

CE 606 Environmental Law and Legislation

Review of techniques of enforcement of state and federal pollution control laws and regulations; effects on waste treatment criteria and design and evaluation of municipal ordinances; preparation of environmental assessments and impact statements.

CE 607 Water Pollution Control Processes

Prerequisite: CH 601. This course is open to non-engineering students only. Study of physical, chemical, and biological processes employed for pollution control. Processes cover the removal of suspended, colloidal, and dissolved phases of pollution.

CE 610 Pollution Prevention Management Technologies

The first half of this course focuses on methods to implement a pollution prevention hierarchy, developing management support, identifying pollution prevention opportunities, assembling a pollution-prevention team, and developing economic justification for potential opportunities. The second half of the course focuses on various technologies available for a wide variety of pollutants, including a review of methods that can be used to integrate the technologies within processes of existing facilities.

CE 612 Advanced Wastewater Treatment

Prerequisite: CE 602. Theories and principles of advanced sewage treatment including nutrient removal, demineralization, distillation, ozonization, carbon filtration, ion exchange, and nitrification; design of facilities; upgrading secondary plants.

CE 613 Industrial Wastewater Control

Prerequisites: CE 601, CE 602. Characteristics of industrial wastes: volumes, sources, types; methods of volume reduction; waste segregation; recovery, recycling, and waste treatment.

CE 614 Surface Water Quality Management

Prerequisite: CE 620. Determination of controls that must be instituted to achieve specific water quality objectives. Waste load allocation as principal management tool, requiring knowledge of response of a system to waste load inputs. Input/response relationships for three different surface water systems: rivers and streams, lakes, and estuaries. Related topics: dissolved oxygen analysis, indicator bacteria, and eutrophication.

CE 615 Groundwater Hydrology

Prerequisites: Undergraduate courses in fluid mechanics and soil mechanics. Study of fundamental principles governing fluid flow in porous and fractured media. Provides necessary foundation for advanced studies in hydrogeology and contaminant hydrology. Includes Darcy's law, the continuity equation, aquifers, flow in the saturated zone, flow nets, wells and well hydraulics, flow in fractures, flow in the unsaturated zone, and groundwater modeling.

CE 616 Contaminant Hydrology

Prerequisite: CE 615. Behavior of contaminants in the subsurface. Emphasis on physical, chemical, and biological processes that determine fate of a contaminant: advection, diffusion, adsorption, mechanical dispersion, and bio-chemical reactions. Quantitative relationships for predictive framework. Applications include site characterization, remediation, wellhead protection, flow and transport modeling, and groundwater waste disposal.

CE 617 Wastewater Residuals Management

Prerequisites: CE 601 and CE 602 or permission of instructor. An overview of rules and regulations affecting treatment and disposal of wastewater residuals. Quantitative and qualitative characteristics are considered. Treatment processes for preliminary operations, thickening, chemical/biological stabilization, conditioning, disinfection, dewatering, drying, thermal reduction, and ultimate disposal are covered extensively, and design procedures are outlined. Case studies address beneficial use of wastewater residuals.

CE 618 Hazardous Waste Treatment

Prerequisites: CE 601 and 602, or permission of instructor. A review of the historical, legislative, and social framework of hazardous waste issues. Physical, chemical, biological, and thermal processes used for decontamination of hazardous wastes and hazardous waste sites are studied extensively. Specific remedial in-situ/ex-situ technologies such as soil vapor extraction, soil washing, incineration, bioremediation, immobilization, and chemical extraction are covered. Includes various laboratory and field case studies.

CE 620 Engineering Hydrology

Prerequisites: Undergraduate course in hydraulics; computer literacy. Theory, methods, and applications of hydrology to contemporary engineering problems. Methods of data collection and analysis as well as design procedures are presented for typical engineering problems. Specific topics to be considered within this framework include the rainfall/runoff process, hydrograph analysis, hydrologic routing, urban runoff, storm water models, and flood frequency analysis.

CE 621 Advanced Hydrology

Prerequisite: CE 620. Examination of water sources and losses; the evaporation and infiltration processes and their effects on stream flow hydrographs. Deterministic and stochastic methods of reservoir analysis and design for purposes of flood protection and water conservation are investigated, as are problems in urban hydrology.

CE 623 Open Channel Hydraulics

Prerequisite: Undergraduate course in hydraulics. Basic theories of open channel flow are presented and corresponding equations developed. Methods of calculating uniform/steady flow; gradually varied flow; and rapid, spatially varied, unsteady flow are investigated. Flow through bridge piers, transitions, and culverts; backwater curves and the design of open channels.

CE 624 Computer Applications in Hydrology/Hydraulics

Prerequisites: CE 620 and CE 623. Investigation of widely used computer software in the areas of hydrology and hydraulics. The theory underlying the programs as well as application and evaluation of software are stressed.

CE 629 Wood Engineering I

Prerequisites: A structural analysis course and a structural design course. Course may not be taken for credit by students who have completed the undergraduate equivalent. Study of the growth and structure of wood and how these influence wood strength, durability, preservation, and fire protection. Analysis and design of structural members of wood using Allowable Stress Design (ASD) method including beams, columns, and connections; design of wood structures. Laboratory experiments included.

CE 630 Reinforced Concrete Design

Prerequisite: Undergraduate course in concrete design and construction. Advanced topics include deep beams, slabs, composite beams, beam columns, stability, connections, creep, and deflection control.

CE 631 Structural Steel Design

Prerequisite: Undergraduate course in steel design and construction. Advanced topics related to the behavior and design of rigid frames (single and multistory), plate girders, and connections.

CE 633 Wood Engineering II
Prerequisite: CE 629, or undergraduate course in wood engineering. Wood properties and determination of allowable stresses. Laminated, built-up, and composite sections. Wood framing systems and connections to resist gravity and lateral loads.

CE 634 Prestressed Concrete Design
Prerequisite: Undergraduate course in concrete design and construction. Analysis and design of pre-tensioned and post-tensioned concrete structures. Beams, columns, connections, partial prestressing, deflections, and anchorage.

CE 640 Structural Analysis
Prerequisite: Undergraduate course in indeterminate structures. Analysis of structures having members with variable cross sections, secondary stresses, shear walls, and semirigid connections. Influence lines for statically indeterminate structures.

CE 650 Soil Mechanics I
Prerequisites: Undergraduate course in soil mechanics; computer literacy. The first in a series of courses dealing with soil mechanics and foundation engineering. Gives the student a better understanding of the basic principles of geomechanics. Includes the nature of soil; soil formation; phase relationships and classification; stress, strain, and strength analysis; flow analysis; and consolidation theory.

CE 651 Soil Mechanics II
Prerequisite: CE 650. Second course in the soil mechanics series. Includes consolidation theory, settlement analysis, soil modification, compaction, lateral earth pressure, slope stability, and soil exploration.

CE 652 Foundation Engineering I
Prerequisite: CE 651. Deals primarily with shallow foundations. Includes types of foundations, site exploration, shear strength, bearing capacity, limit states, settlement, allowable pressure, and rafts and mats.

CE 653 Foundation Engineering II
Prerequisite: CE 652. Deals primarily with deep foundations. Topics include pile foundations, pile types, pile driving, load testing, design of individual piles, group action, drilled pier foundations, construction methods, and capacity in sand and clay.

CE 660 Project Planning
Application of network analogy to project planning and scheduling; resource, time, and financial management. Computer applications are included.

CE 661 Air Pollution Fundamentals
An introduction to the sources of air pollution, transport of gaseous and particulate pollutants in the atmosphere on local and global scales, transformations of pollutants by atmospheric processes, impact of airborne pollutants on the environment, control of sources of air pollution, and legislative mandates. Introduction to meteorological concepts and computer transport models. Current issues such as ozone depletion and global warming are discussed. (See also CM 621.)

CE 670 Selected Topics
A study of relevent topics of particular interest to students and instructor. Course may be taken more than once.

CE 678 Computer Applications in Civil Engineering
Prerequisite: Introductory course in computer fundamentals. The design and analysis of software and hardware systems for the solution of civil engineering problems. Includes software engineering, software coding, and evaluation of hardware and software.

CE 690 Research Project
Prerequisite: 18 graduate credits or permission of the department chair and program coordinator. Independent study under the guidance of an advisor in an area of mutual interest, each study terminating in a technical report of academic merit. Research may be in such environmental areas such as water resources, stream pollution, solid waste management, and air pollution.

CE 695 Independent Study I
Prerequisite: Permission of program coordinator. Independent study under the guidance of an advisor in an area designated by the program coordinator.

CE 696 Independent Study II
Continuation of Independent Study I.

CE 698 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

CE 699 Thesis II
Continuation of Thesis I.

Chemistry

CH 600 Introduction to Environmental Chemistry
Prerequisite: One year of undergraduate general chemistry. Designed as a prerequisite for CH 601 for students who have one year of undergraduate general chemistry but lack organic

chemistry. Review of general and introductory organic chemistry, with examples taken from topics of environmental concern including pollutants, toxicology, and environmental analytic methods.

CH 601 Environmental Chemistry

Prerequisites: One year of undergraduate general chemistry, plus one semester of organic chemistry or CH 600. Areas of consideration: the sources, reactions, transport, effects, and fates of chemical species in water, soil, and air environments, as well as the influence of human activities on these processes.

CH 602 Environmental Chemical Analysis

Prerequisite: CH 601 or equivalent. Theory and laboratory training in the applications of instrumental methods in the analysis of environmental samples. Topics include sampling techniques; chromatography; ultraviolet-visible, infrared, and atomic absorption spectroscopy; mass spectrometry; nuclear magnetic resonance spectrometry; biochemical methods and use of radioisotopes.

CH 605 Organic Reaction Mechanisms

Prerequisite: One year of undergraduate organic chemistry. This course deals with the structure and mechanisms of organic reactions, including stereochemistry and conformational analysis, acid-base catalysis, substitution, addition, and elimination reactions, as well as concerted reactions.

CH 606 Modern Organic Synthetic Methods

Prerequisite: CH 605 or equivalent, or consent of instructor. A survey and discussion of methods. Topics include synthetic strategies such as computer-generated strategies, asymmetric syntheses, oxidation, reduction, stereocontrol and ring formation, protecting groups, nucleophilic and electrophilic species that form carbon-carbon bonds, and some complex molecules.

CH 611 Special Topics in Advanced Organic Chemistry

Advanced course dealing with topics such as stereochemistry, photochemistry, natural products, and mechanisms of organic reactions.

CH 612 Molecular Structure Determination

Prerequisites: Evidence of mastery of the concepts of organic chemistry and of proficiency in the basic spectroscopies. Equivalent UNH prerequisite courses are CH 202 Organic Chemistry and CH 221 Instrumental Methods of Analysis. This course focuses on the use of NMR methods and mass spectral data to elucidate structures of small- to medium-size organic molecules, with an emphasis on pharmacologically active compounds and synthetic intermediates. Extensive interpretation of NMR data obtained for routine active nuclei in single and multidimensional experiments. Methods include 1H mapping, COSY, NOE, 13C DEPT series, and other modern experiments. Utilization of low- and high-resolution mass spectral data accompany explanations of the processes for the selection of a method of acquisition to be used to obtain structure information. Discussion of various sample introduction methods: LC, GC, DIP, maldi, and ionization techniques. The course also includes a review of the supporting spectroscopies and x-ray crystallography to culminate in developing an understanding of chemical structure determination as relevant to molecular structure identification and mixture evaluation.

CH 621 Chemical Forensic Analysis with Laboratory

Advanced techniques and new developments in the identification of various materials such as pigments, dyestuffs, food additives, pharmaceutical preparations, polymers, synthetic fibers, and inorganic material products. 4 credits.

CH 625 Chemistry of Fires and Explosions

An examination of the basic organic chemistry and combustion and explosive properties of flammable materials. The chemical principles underlying fires and explosions. Chemical properties of various synthetic materials and the products of their combustion. Fire-retardant materials and chemicals used in fire extinguishment. (See also FS 625.)

CH 631 Advances in Analytic Chemistry

Provides background on recent advances in instrumentation and current analytic techniques.

CH 640 Chemical Separations

Prerequisite: Evidence of mastery of the concepts of chemistry as demonstrated with a B.S. degree in chemistry or biology. Students should have courses equivalent to UNH courses CH 202 Organic Chemistry and CH 221 Instrumental Methods of Analysis. Biological systems contain many thousands of organic compounds that are present at very low concentrations. This course deals with current methods of separating, detecting, and quantifying pharmaceuticals and associated metabolites and other "small molecule" organic agents present in complex animal and agricultural samples. Clean-up methods include liquid and solid phase extractions, gel filtration, size-exclusion, ion-exchange, and affinity chromatography. Analytical methods emphasize HPLC, GC with MS and fluorescence detection, and detection-oriented derivatization. Comparison and evaluation of different techniques are presented with practical examples.

CH 650 Medicinal Chemistry

Prerequisite: One year of undergraduate organic chemistry. Recommended: An advanced undergraduate organic chemistry course. Medicinal chemistry is the investigation, discovery, and development of therapeutic agents. A key concept is the understanding of the relationship between chemical structure and drug activity. This course is interdisciplinary in its approach, with the goals of understanding drug action and designing new drugs. Medicinal chemistry incorporates knowledge of a wide scope of disciplines such as chemistry, biology, and pharmacology. This course emphasizes the fundamental principles of medicinal chemistry and surveys major classes of drugs.

CH 655 Pharmacology

Prerequisites: One year of undergraduate organic chemistry and one term of biochemistry. Recommended: An advanced undergraduate organic chemistry course, at least one graduate course in biochemistry (MB 601–MB 603), and a graduate course in cell biology (MB 607). Pharmacology is the study of therapeutics — agents administered to achieve a beneficial therapeutic effect on some disease process. This survey course provides an overview of pharmacology including principles of pharmacodynamics (mechanism of action of drugs) and pharmacokinetics (the role of drug absorption, distribution, metabolism, and excretion). General concepts are applied to case studies of specific drugs taken from the main classes of therapeutic agents.

CH 665 Combinatorial Chemistry

Prerequisites: CH 650 Medicinal Chemistry and CH 606 Modern Organic Synthetic Methods. Students are expected to have a strong undergraduate background in organic chemistry. Combinatorial chemistry is a relatively new approach for producing large collections of compounds for analysis. This course covers the fundamental techniques and ideas for generating diverse libraries of compounds. Students learn to utilize several computer packages to design, analyze, and evaluate combinatorial libraries. Examples are drawn principally from drug design since combinatorial chemistry has had a major impact on the development of new pharmacological agents. Students anticipating careers in pharmaceutical or biotechnology industries will find this course of value.

CH 670 Selected Topics

A study of selected issues of particular interest to the students and instructor. May be taken more than once.

CH 680 Graduate Seminar I

Prerequisite: Permission of the instructor. Weekly discussions of current topics in medicinal chemistry and presentations of student and faculty research projects. 1 credit.

CH 681 Graduate Seminar II

Prerequisites: CH 680 Graduate Seminar I, E 659 Writing and Speaking for Professionals, and permission of the instructor. Weekly discussions and seminars on current topics in medicinal chemistry are presented by students and faculty. Students make a formal presentation of their research. 1 credit.

CH 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

CH 696 Independent Study II

Continuation of Independent Study I.

CH 698 Thesis I

Prerequisite: Completion of 15 credits of graduate work. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

CH 699 Thesis II

Continuation of Thesis I.

Criminal Justice

CJ 600 Computer Crime: Legal Issues and Investigation Procedures

An overview of computer crime and the procedures that forensic computing specialists, law enforcement investigators, and prosecutors must invoke successfully to prosecute computer criminals.

CJ 601 Mental Health, Law, and Criminal Justice

Basic psychological theory and specific applications in the criminal justice system are explored. Particular emphasis is placed on mental health issues as they affect the criminal justice system.

CJ 602 Computers, Technology, and National Security Information Management Systems

An introduction to information systems used within our national security system. A framework is provided for understanding the needs, types, capabilities, and applications of management information systems. An overview of existing national security information systems is presented with implications for future needs. Finally, the impact of science and technology upon our national security agencies and how information management systems will prepare us for 21st century challenges also analyzed.

CJ 603 Internet Vulnerabilities and Criminal Activity

This course provides appropriate strategies for the proper documentation, preparation, and presentation of investigations involving the Internet, and familiarizes students with legal information that impacts Internet investigations.

CJ 604 Network Security, Data Protection, and Telecommunications

A comprehensive introduction to network security issues, concepts, and technologies. The core technologies of access control, cryptography, digital signatures, authentication, network firewalls, and network security services are reviewed. Issues of security policy and risk management are considered.

CJ 605 Theories of Criminal Behavior

A survey of theories relating to the scope and nature of the crime problem. Consideration of the problems of deviancy including social norms deviancy, mental disturbances, juvenile crime, and possible and actual responses to deviancy. Various approaches to the problem of rehabilitation.

CJ 606 Domestic and Sexual Violence

An in-depth analysis of the typologies, causes, correlates, dynamics, and effects of domestic and sexual violence and victimization. Includes a review of treatment practices in these areas.

CJ 607 Psychological Applications in Criminal Justice

Prerequisite: CJ 601 or permission of instructor. This course explores psychological theory and research in relation to specific problems in criminal justice. Assumptions underlying behavior analysis in criminal investigation and profiling, eyewitness testimony, jury selection, violence prediction, risk assessment, personnel screening, and children as victims are examined. Students are expected to develop an application in a specific area of expertise using class and textual content as a base.

CJ 608 Law and Evidence

Comprehensive study of the rules of evidence, particularly as applied to physical evidence. Includes judicial notice, presumptions, hearsay rules, confessions, admissions, scientific evidence, and expert testimony. Emphasis on criminal law applications.

CJ 609 Social and Structural Models of Crime

Prerequisite: CJ 605. This course is part of a package of courses focused on criminal behavior that are part of the new Ph.D. in Criminal Justice program.

CJ 610 Administration of Justice

A study of the steps of the criminal justice system, from the time the accused is arrested until sentencing to a correctional facility. The objectives are to review the problems that arise during this process and to consider possible solutions that will benefit the individual being processed without subverting the purposes of the process.

CJ 611 Research Methods in Criminal Justice

An introduction to quantitative and qualitative methods used in criminal justice for research and policy analysis. Students become familiar with basic types of research designs, survey research methods, and evaluation methods.

CJ 612 Criminal Justice Management

The development of the theory and practice of criminal justice management in the United States. Covers significant developments and ideas of those who have made major contributions to American criminal justice management.

CJ 613 Quantitative Applications in Criminal Justice

Prerequisite: CJ 611. An introduction to quantitative applications in the field. Basic descriptive and inferential statistics. Topics include measurement scales, measures of central tendency, measures of dispersion, data distributions, sampling, probability, hypothesis testing, Chi Square, Z-Test, T-Test, and analysis of variance models. Students are also introduced to the use of SPSS for data analysis.

CJ 615 Rational Models of Crime

Prerequisite: CJ 605. A survey of rational choice theories of crime from sociology, psychology, economics, and political science perspectives. Topics include deterrence, routine opportunities theory, incapacitation, and conflict approaches to understanding crime and criminal behavior.

CJ 617 Advanced Victimology

An in-depth analysis of the causes, correlates, dynamics, and aftereffects of criminal victimization on victims of crime, and a review of current practices in the area of crime victim assistance.

CJ 618 Crime Victims' Rights and Services

An analysis of the legal rights of victims of crime at both the state and federal levels, and how these laws relate to specific victim advocacy and service-providing programs, with an in-depth treatment of the management and administration of crime victim programs.

CJ 619 Psychology of Crime

Prerequisites: CJ 601 and CJ 605. A survey of psychological explanations of criminal behavior. Topics include psychoanalytic theories, trait theories, social learning, cognitive learning, bio-social theories, developmental theories of crime, and economic and social psychological theories of criminal behavior.

CJ 622 Advanced Quantitative Applications in Criminal Justice

Prerequisite: CJ 613 or its equivalent. An introduction to multivariate statistical techniques as applied in criminal justice research. Topics include regression analysis, discriminant analysis, factor analysis, manova, and multivariate significance tests.

CJ 623 Mental Health Law

Prerequisite: CJ 601. Review of civil and criminal law as it relates to mental health issues. Topics include competence to stand trial, insanity, competence to be executed, civil commitment, sexual predator commitment statutes, confidentiality, duty to warn, and issues of expert testimony. Ethical issues and issues of professional responsibility are covered.

CJ 624 Group Process in Criminal Justice

Small group interaction; both theoretical and experimental facets of group process are presented. Group counseling and encounter groups.

CJ 625 Information Systems Threats, Attacks, and Defenses

This course provides an overview of the actors, motives, and methods used in the commission of computer-related crimes, and describes the methods used by organizations to prevent, detect, and respond to these crimes. (See also NSP 625.)

CJ 626 Firewall and Secure Enterprise Computing

This course covers theory and practices of Internet firewalls, and the details and vulnerabilities of the IP and embedded protocol sites. In the laboratory/online portion of the course students construct, deploy, and test a real firewall against common Internet attacks. (See also NSP 626.)

CJ 627 Internet Investigations and Audit-Based Computer Forensics

Theory and techniques of tracking attackers across the Internet and gaining forensic information from computer systems. The course includes case studies of Internet-based crimes and addresses limits of forensic techniques. (See also NSP 627.)

CJ 628 Computer Viruses and Malicious Code

This course addresses theoretical and practical issues surrounding computer viruses. (See also NSP 628.)

CJ 629 Practical Issues in Cryptography

Examples of current historical cryptography and steganographic systems; major types of cryptosystems and cryptanalytic techniques, and how they operate; hands-on experience with current cryptographic technology. (See also NSP 629.)

CJ 630 Investigating Financial Crimes

Study of principles and techniques associated with investigating financial crimes. Emphasis on case-study approach to understanding financial crimes investigation.

CJ 635 Global Perspectives on Crime and Justice

Affords students the opportunity to explore a number of foreign and criminal justice systems with emphasis on policing. Different perspectives of crime problems are viewed through the prism of foreign culture. Specific countries and topics vary.

CJ 637 Criminal Justice Policy

Examines the formulation and implementation of criminal justice policy, including an introduction to policy analysis in the criminal justice context.

CJ 638 Public Policy Analysis in Criminal Justice

Prerequisites: CJ 613 and CJ 637 or their equivalent. An introduction to public policy and program analysis as applied within the criminal justice field. Topics include the impact of basic research on policy formulation and implementation. Special attention is given to issues of decision-making and its tools.

CJ 646 Abnormal Psychology in Forensic Populations

Prerequisites: Undergraduate or graduate course in abnormal psychology, and CJ 601. This is an advanced course in mental disorders associated with prisons and other forensic practice. Emphasis is on disorders involving violent and predatory behavior including personality disorders, psychosis, pedophilia, and other sexual paraphilias. Special emphasis on psychopathy, psychopathology, and criminal behavior. Well-known forensic cases are examined. This course is a prerequisite for all other courses in the Forensic Psychology sequence. (See also P 656.)

CJ 647 Forensic Assessment

Prerequisite: CJ 646. This course reviews the spectrum of assessment methods used in evaluation and treatment in inmate and forensic settings. Various techniques of forensic interviewing are examined. Emphasis on ability to assess violence and risk is included. Students will come to understand the strengths and limitations of a wide variety of forensic assessment methods. Additional attention is given regarding techniques to assess malingering. (See also P 657.)

CJ 648 Forensic Treatment Models

Prerequisite: CJ 647. This course examines various mental health treatment modalities, with particular emphasis on treatment for

patients/inmates in the forensic system. Psychopharmacology, group therapy, cognitive techniques, community-based management, faith-based approaches, and social skills training are covered. Treatments for insanity acquittees, incompetent-to-stand-trial patients, inmates, juvenile offenders, psychopaths, and sex offenders are examined. Management of high-risk forensic populations is covered. Particular emphasis is on current research findings regarding the effectiveness of these approaches with forensic populations. (See also P 658.)

CJ 649 Fire Scene Investigation and Arson Analysis

The techniques of crime scene documentation and investigation as they relate to fire and explosion scenes. Evidence recognition and collection. Laboratory analysis of fire-scene, arson-accelerant, and explosion-scene residues. Scientific proof of arson. Laboratory fee required. 4 credits. (See also FS 649.)

CJ 650 Death Investigation: Scene to Court

Enrollment restricted to fully matriculated graduate students in criminal justice and forensic science. An in-depth study of the principles and techniques associated with investigating homicides; suicides; and accidental, natural, or equivocal deaths. While considering the sociological, psychological, and legal aspects typically found in these cases, the process takes students from the scene to the criminal or civil court.

CJ 651 Criminal Procedure

An inquiry into the nature and scope of the U.S. Constitution as it relates to criminal procedures. Areas covered include the law of search and seizure, arrests, and right to counsel.

CJ 652 Sexual Offenders and Predators

An in-depth study of behavioral patterns and dynamics associated with persons who commit sexually motivated crimes and of the processes of victim selection and the identification of sexual offenders.

CJ 655 Crime Prevention Through Environmental Design

Analysis of theory and applied methods of crime prevention using environmental design methods. Experiential exercises are included.

CJ 656 Problem-Oriented Policing

In-depth examination of problem-oriented policing, including examination of SARA model, specialized tactics, and methods of community analyses.

CJ 657 Crime Mapping and Analysis

Survey of geographical information systems (GIS) research and applications in the field of public safety, including analysis of hot spots, density patterns, and forecasts of crime patterns.

CJ 658 Leadership Issues in Policing

Study of leadership within modern police organizations. Experiential exercises are included.

CJ 659 Futures Research: Long-Range Planning and Forecasting in Criminal Justice

An advanced examination of the philosophical underpinnings of the discipline of futures research. The distinctions between conventional and long-range planning are discussed. A multidisciplinary approach is utilized. Students learn to make use of several selective forecasting methodologies. The focus is on the implementation of empirically derived strategies in the context of justice system organizations. The purpose is to learn to effect meaningful social change.

CJ 667 Fire and Building Codes, Standards, and Practices

The study of building and fire codes and regulations as they relate to prevention and incidence of structural fires. Contemporary building and fire codes and practices and their enforcement. Model building codes. Fire prevention and control through building design. (See also FS 667.)

CJ 668 Fire and Casualty Insurance Practices

A study of financial risk and decision-making. Insurance rate-making and relation to risk and other factors. Insurance adjustment and economic factors that must be considered in fire and accident investigations. (See also FS 668.)

CJ 669 Dynamics, Evaluation, and Prevention of Structural Fires

A detailed analysis of the evolution of modern structures and the mechanical systems necessary to provide safety and comfort. The effect of the nature of structures and their mechanical systems on fire behavior. Structural basis and mechanical systems for fire protection and fire prevention. (See also FS 669.)

CJ 670 Selected Topics

A study of selected issues of particular interest to the students and instructor. May be taken more than once.

CJ 675 Private Security Law

A review and examination of currently applicable federal and state administrative, civil, criminal, and constitutional laws as they relate to the private security industry. The framework of the course includes sources of authority and common law.

CJ 676 Security Management Seminar
Current problems, concerns, issues, and legislation affecting the private security industry as they relate and are of interest to the students and instructor.

CJ 677 Private Security in Modern Society
An introduction to current thinking and problems relating to the private security industry. The course examines issues such as historical growth, role, mission, and future of the industry. Other topics include professionalization and ethics in the field.

CJ 680 Research Issues in Cyberterrorism
This course consists of lectures, discussions, and empirical research into issues of cyberterrorism — its causes, limitations, and implications. It focuses largely on the thresholds and factors that drive terrorist groups into the information arena, the use of information technology by terrorist groups, and the emergence of new terrorist groups that use the information arena as their primary terrorism mechanism.

CJ 684 Fire Scene Reconstruction
Application of principles of reconstruction of a fire scene, including fire behavior, fire pattern analysis, ignition mechanisms, interpretation of human behavior, and fire scene analysis. Emphasis on scene documentation, origin and cause determination, report preparation, arson motives, and rendering of advisory opinions to assist in the resolution of disputes affecting life and property. (See also FS 684.)

CJ 690 Research Project I
Individual guidance on a research endeavor. 1–3 credits.

CJ 691 Research Project II
Prerequisite: CJ 690. 1–3 credits.

CJ 693 Criminal Justice Internship I
The student's formal educational development will be complemented by field placement experience in various criminal justice settings or agencies. Field experience is supervised by designated agency and department personnel.

CJ 694 Criminal Justice Internship II
Continuation of Criminal Justice Internship I.

CJ 695 Independent Study
A directed independent learning experience, the topic and format to be agreed upon by the student and supervising faculty. 1–3 credits.

CJ 697 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings and discussions of the individual student's progress toward the completion of the thesis.

CJ 698 Thesis II
Continuation of Thesis I.

CJ 699 Thesis III
Continuation of Thesis II.

Chemical Engineering

CM 621 Air Pollution Fundamentals
Prerequisite: CH 601 or permission of instructor. An introduction to the sources of air pollution, transport of gaseous and particulate pollutants in the atmosphere on local and global scales, transformations of pollutants by atmospheric processes, impact of airborne pollutants on the environment, control of sources of air pollution, and legislative mandates. Introduction to meteorological concepts and computer transport models. Current issues such as ozone depletion and global warming are also discussed. (See also CE 661.)

CM 622 Air Pollution Control
Prerequisite: CM 621 or permission of instructor. Covers conventional and emerging air pollution control technologies. Conventional technologies include cyclone separators, baghouse filters, wet scrubbers, electrostatic precipitators, thermal and catalytic incineration, absorbers, and adsorption systems. Emerging technologies vary with new developments. Legislative mandates related to control technologies and emission limits are discussed.

CM 624 Chemical Process Safety
Prerequisite: Undergraduate degree in engineering, chemistry, or physics, or permission of instructor. Methods of analysis and design for the control of hazards as applied to a chemical process environment. Emphasis on applications and current industrial practices. Topics include characterization of chemical hazards, toxic release modeling, fire and explosion prevention, pressure relief equipment design, hazard identification/risk assessment techniques, and accident investigation.

CM 670 Selected Topics
A study of selected issues of particular interest to the students and the instructor. May be taken more than once.

CM 690 Project
Prerequisite: 15 graduate credits or permission of the department chair and program coordinator. Independent work under the guidance of an advisor in an area of mutual interest, each study terminating in a technical report of academic merit. May involve research or design activity to solve a significant technical problem that utilizes chemical engineering concepts.

CM 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

CM 696 Independent Study II
Continuation of Independent Study I.

CM 698 Thesis I
Prerequisite: Completion of 15 credits of graduate work. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

CM 699 Thesis II
Continuation of Thesis I.

Communication

CO 620 Applied Communication in Organizations
This course is a survey of communication theory as applied to the organizational environment. Special attention is directed toward management communication styles, conflict, disagreement, change in organizations, formal vs. informal power and communication, people in organizations, structure of organizations, motivations, barriers to effective communication, and competencies involved in effectively communicating to the organization's internal and external audiences.

CO 621 Managerial Communication
Prerequisite: MG 637 or MG 640 or P 619 or PA 601. Major emphasis on the role of communication in a democracy and the effects of communication content. Brief treatment of content analysis techniques, person-to-person communication, and barriers to the flow of communication.

CO 623 Communication in Health Care
Examination of the diversity of communication encounters and contexts in which allied health professionals may be involved; emphasis on development of competencies and skills necessary to communicate effectively with staff, patients, and the community. Influence of interpersonal communication and mass media in staff development, patient care, and the marketing of health care. Students will develop a communication campaign aimed at internal and external audiences.

CO 631 Public Information Dynamics
How the executive can best present the organization in an accurate and favorable light to the news media. Provides training techniques for the public relations person who works with executives giving corporate messages internally and press statements externally.

CO 632 Contemporary Public Relations Issues
Using a case-study approach, the course concentrates on the problems facing management and public relations executives in businesses and other institutions. The problems change from year to year, in tune with developments in society.

CO 640 Communication Technologies
An in-depth examination for nontechnical students of technologies used with visual, voice, data, and character information for communicating at a distance; for storing and subsequently retrieving information; and for processing information to improve communication efficiency.

CO 641 Competition and Regulation in Telecommunication
A study of proceedings before state public utility commissions and the Federal Communications Commission delineating the boundaries between those activities in the telecommunication field subject to regulation, those open to competition with restrictions, and those cleared to be fully competitive. The course includes discussion and analysis of contemporary legal proceedings affecting this topic.

CO 642 Management of Telecommunication Organizations
A study and comparison of managerial systems and practices in users, manufacturers, distributors, and common carriers of telecommunication facilities. Identification of criteria necessary for developing and maintaining effective telecommunication organizations. Case problems relate largely to specific instances from this field.

CO 643 Telecommunication Policy and Strategy
Examination of management policies and strategies for the complex telecommunication organization operating in a dynamic environment, from the viewpoint of the top-level executives of the organization. Development of analytic frameworks for the management of numerous elements involved in assuring the fulfillment of the goals of the total organization. Integration of the student's general business knowledge with the content of the course. Emphasis is placed on the examination and discussion of cases drawn largely from the telecommunication industry.

CO 670 Selected Topics
Prerequisite: Permission of advisor. An in-depth examination of a topic in the field of communication that reflects the special research of a faculty member or the special interest of a group of students. May be taken more than once.

CO 693 Internship
A program of field experience, approved by the program advisor, under the tutelage of a professional in the field of communication.

CO 695 Independent Study I
A planned program of individual study or research in communication under the supervision of a member of the faculty.

CO 696 Independent Study II
Continuation of Independent Study I.

CO 698 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings with the advisor for discussion of the individual student's progress in the preparation of a thesis.

CO 699 Thesis II
Continuation of Thesis I.

Computer Science

CS 604 Introduction to Programming/C
Prerequisite: College Algebra (M 109 or equivalent). A first course in computer programming using the C language, for those with little or no experience with programming. Problem-solving methods, program planning, development, and testing. Sound programming practices and proper style. Simple preprocessor usage, objects, expressions, functions, libraries, basic types, arrays, and pointers. Extensive programming required.

CS 610 Intermediate Programming/C
Prerequisites: College Algebra (M 109 or equivalent) and CS 604 or permission of instructor. An intermediate-level programming course covering all aspects of the ANSI C language, its pre-processor, syntax and semantics, modern usage, design and solution techniques, as well as elements of data structures, algorithms, and analysis of programs. Emphasis is on construction of portable, modular programs.

CS 617 Java Applet Programming
Prerequisite: CS 610. Object-oriented programming, graphic interfaces, and event handling in Java, using Swing and the Abstract Windows Toolkit. Also covers files, exceptions, concurrency, and synchronization with threads.

CS 620 Data Structures
Prerequisite: CS 610. Data structures, their functions and uses. Topics include basic data representations, arrays, linked structures, stacks, queues, trees, graphs, hashing. The relationship between data structures and algorithms. Sorting and searching, elements of complexity analysis. Recursion and other solution techniques. Students will develop and run several programs.

CS 622 Database Systems
Prerequisite: CS 604 or knowledge of a programming language. A survey of database systems, their purposes, structures, functions, and uses. Topics include an overview of DB systems, major DB models, design and implementation, introduction to typical DB systems, and internal operation of DB systems.

CS 622B Advanced Database Systems
Prerequisite: CS 622. A second course in database systems covering advanced topics and new developments in the database field. Topics include database design methodologies and evaluation, embedded SQL, concurrency control, recovery schemes, security, query processing and optimization, and an introduction to object-oriented databases.

CS 623 Rapid Software Development/VB.Net
Prerequisites: CS 620, CS 622. A course for experienced programming students in rapid software development within the environment of VB.Net. Topics include the VB IDE (Integrated Development Environment), human-computer interaction, GUI interface development, legacy remote-database connectivity using ODBC, as well as Data Access Object (DAO), Remote Data Object (RDO), and ActiveX Data Object (ADO) methods. Students will conceive, design, code, implement, document, and present a substantial programming project.

CS 625 Software Project Management
Prerequisite: CS 610. Project management, roles, and planning, including software and estimation, software quality, industry standards, technical staff evaluation, team management, project recovery, and risk management.

CS 626 Object-Oriented Principles and Practice/C++
Prerequisite: CS 620. An advanced programming course taught in the C++ language. Objects, methods, abstract data types, data hiding, templates, inheritance, polymorphism, and exception handling. Students will design and code several modular projects using C++.

CS 627 Distributed Database Systems
Prerequisites: CS 622, CS 644. A course on the concepts, analysis, and design of distributed database systems. Topics include architectures, design, semantic data control, distributed query processing, optimization of distributed queries, query decomposition, localization of distributed data, transaction management, concurrency

control, distributed object management, distributed database reliability, and parallel database systems.

CS 628 Object-Oriented Analysis and Design

Prerequisite: CS 617 or CS 623 or CS 626 or permission of instructor. An object-oriented design methodology course. Topics include system analysis, design, and implementation. Primary emphasis on the Unified Modeling Language (UML) methodology and its importance in developing a software project. Students will design a major group project and implement portions using C++ or Java or C#.

CS 630 Introduction to Computing Theory

Introduction to the theory of computers and computation including the study of formal systems and methods; regular expressions, formal languages and grammars; elements of parsing theory and the Chomsky hierarchy; finite automata and pushdown automata; decidability; Turing machines, Post machines, and other formal computer models; and elements of complexity theory.

CS 632 Algorithm Design and Analysis

Prerequisite: CS 620. Study of the time and space complexity of algorithms and of efficient algorithm design. Topics include amortized analysis, advanced data structures, greedy algorithms, divide-and-conquer, dynamic programming, randomized algorithms, and NP-Completeness.

CS 634 Cryptography and Data Security

Prerequisite: CS 610. A survey of cryptographic concepts and algorithms and their application to data security. Techniques studied include private key cryptosystems, public key cryptosystems, and hash functions. Commonly used algorithms are also studied, including DES, 3DES, IDEA, RSA, Diffie-Hellman, MD5, SHA, and DSS. Other algorithms examined are those used to provide confidentiality, message authentication, key exchange, and digital signatures in applications such as client-server authentication, email security, and web security.

CS 636 Structure of Programming Languages

Prerequisite: CS 620. The structure, syntax, and semantic aspects of computer languages are studied. Programs will be written in the FORTH language.

CS 640 Computer Organization

The structure and function of computers. The nature and characteristics of modern computer systems and the operation of individual components: CPU, control unit, memory units, and I/O devices. Topics include addressing methods, machine-program sequencing, microprogramming, complex I/O organization, interrupt systems, multiple-module memory systems and caches, peripheral devices, microprocessors, pipeline organization, and memory interleaving.

CS 640B Parallel Computer Architectures

Prerequisites: CS 610, CS 640. Parallel and other high-performance architectures and their implications for system software, including three structural classes: pipelined computers, array processors, and multiprocessors. Topics include memory, I/O subsystems, and the interconnection network needed in parallel computers; the design principles and applications of pipelined super-computers; the interconnection structure of array processors; operating system controls; coordination of parallel activity; and performance of parallel systems.

CS 642 Computer Networks and Data Communication

Prerequisite: CS 644. The ISO 7-level model, network topology, communications theory, protocols, virtual circuits and packet switching, local networks (CSMA/CD, token ring), and error detection and correction. Additional topics may include security, TCP/IP, and sockets.

CS 644 Operating Systems

Prerequisite: CS 640. Study of the function, structure, and design of computer operating systems, principally multiprogramming systems. Topics include management of processes and processor resources, of data and memory, and of peripheral devices; concurrent processes; system protection; scheduling; paging and virtual systems.

CS 644B Distributed Operating Systems

Prerequisite: CS 644. A second course in operating systems and system architecture covering advanced topics in distributed systems, and the new technology in hardware/software developments. Includes hardware and software concepts of distributed systems, inter-process communication, distributed objects, message-oriented and stream-oriented communication, synchronization, process scheduling, fault tolerance, consistency, replication, distributed file systems, real-time distributed systems, concurrency, and access control.

CS 645 Network Administration

Prerequisite: CS 640 or EE 610 or EE 682 or permission of the instructor. Fundamentals of administration of a networked computer. Topics include basic duties of a system administrator, overview of TCP/IP networking, file system layouts, user management, network services (such as DNS, NIS, DHCP, file sharing, printing, mail,

FTP, Web), interfacing different operating systems on one network, and general security issues including prevention through firewalls and secure shells. Lab exercises use both Unix and Windows systems.

CS 646 Introduction to Computer Security

Prerequisite: CS 604. Knowledge of networks is desirable. A survey of computer and network security issues including types of network attacks, viruses, intrusion detection and tracking, firewalls, trust relationships and authentication, secure connections, cryptography, and recent security policy and legislation.

CS 646B Topics in Computer Security

Prerequisites: CS 645 and CS 646. An in-depth look at the security-related issues of a selection of services and applications provided by computers in various infrastructures. Services may include, but are not limited to, email, websites, E-commerce support, communication techniques such as IM and VOIP, databases, directory services, authentication using PKI, KDC, and biometrics, e-voting, J2EE, and .Net computing and server hardening.

CS 647 Systems Programming

Prerequisite: CS 620. Techniques for systems programming using the C language and libraries. Topics include data structures for system implementation, string processing, macro preprocessors, conditional compilation, UNIX system calls including file and directory operations and process control, interprocess communication, client-server routines. Programming projects required.

CS 649 Network Analysis

Prerequisite: CS 642 or EE 610. Building on a foundation of knowledge of local area networks (LANs), wide area networks (WANs), and the OSI model, both large and small network designs are explored through lectures, labs, and individual and major group projects. Topics and labs include Windows server administration; UNIX connectivity; Ethernet and Token Ring networks; implementing WANs using a simulated T1 environment, wireless LAN environments; configuring DSL routers, multi-vendor routers, managed switches, and network packets.

CS 650 Computer Graphics

Prerequisite: CS 620, or M 610 or equivalent. The mathematical foundations for computer graphics and introduction to state-of-the-art graphics programming. Includes 2-D and 3-D viewing, geometric transformations, clipping, segmentation, user interaction, curves, surfaces, color, modeling, and object hierarchy.

CS 652 Script Programming for Network Administration

Prerequisite: CS 604. Concepts and details of writing small programs in Python for the UNIX and Windows-Server operating systems. Security issues in shell scripts, batch file programming. Students will write scripts to control network system resources.

CS 655 Web-Database Application Development

Prerequisite: CS 617, CS 622 or CS 623 or permission of the instructor. Fundamental principles and techniques for creating network applications. Topics include establishing network connections, database connectivity, Java Server Pages (JSP) and Active Server Pages (ASP), HTML Forms, client side scripting, XML, and network security issues.

CS 657 Human Computer Interaction

Prerequisite: CS 610 or permission of the instructor. The study of psychological and physiological factors on the design of the Human-Computer Interface (HCI). The influence of the various input and output devices on the efficacy of the interaction. Evaluation of the interaction as a function of interface design. Evaluation issues include qualities such as learnability, usability, human efficiency, and accuracy. Students will design, implement, analyze and evaluate Graphical User Interfaces (GUIs).

CS 660 Artificial Intelligence

Prerequisite: CS 610. An introduction to the fundamental methods of artificial intelligence (AI) used in problem solving. Techniques include heuristic search, optimization, genetic algorithms, game playing, expert systems, probabilistic reasoning, learning strategies, neural networks, natural language understanding, and image understanding.

CS 663 Mobile Robotics

Prerequisite: CS 620, or permission of the instructor. Principles of construction and navigation of mobile robots. Topics include locomotion mechanisms, sensor types and usage, reactive behavior, tracking, obstacle avoidance, path planning, and communication schemes for remote control. Students work both individually and in groups to construct and program small mobile robots using Lego Mindstorm kits.

CS 665 Digital Image Processing

Prerequisites: CS 620, M 610 or equivalent. Theoretical and mathematical bases of techniques of digital image processing and programming methodologies necessary to implement such techniques. Introduction to current capabilities of digital image acquisition hardware. Implementation of standard procedures for image enhancement, morphology, compression, and storage. Image transforms and information extraction techniques in both the spatial and Fourier frequency domains.

CS 670 Selected Topics
Prerequisites: The nature of any prerequisites depends on the topic. An examination of new developments or current practices in computer science. Topics vary from trimester to trimester.

CS 690 Project
Prerequisites: 15 credits, a quality point ratio (QPR) of at least 3.1, and completion of all core courses. Petition to register must be approved by a supervising faculty member, the program coordinator, and the department chair. A significant project must be completed in the student's concentration area under the guidance of an advisor, such study terminating in a technical report of academic merit. For example, the project may be a survey of a technical area in computer science or may involve the solution of an actual or hypothetical technical problem.

CS 691 Computer Security Certification Preparation
Prerequisite: Completion of required course work in the M.S. Computer and Network Security program. Under the supervision of a faculty member, the student prepares for taking an industry standard certification exam. This includes writing an independent research paper on a current security topic and passing an exam similar in nature to the certification exam.

CS 692 Internship I
Prerequisites: CS 620, 18 graduate credits, QPR of 3.0 or better, and permission of graduate coordinator and advisor. An on-the-job learning experience with a selected organization, taken for academic credit under the supervision of a faculty internship advisor. 1 credit.

CS 693 Internship II
Continuation of Internship I. 1 credit.

CS 694 Internship III
Continuation of Internship II. 1 credit.

CS 695 Independent Study I
Petition to register must be approved by a supervising faculty member, the program coordinator, and the department chair. Independent study under the guidance of an advisor in an area designated by the program coordinator in consultation with the student.

CS 696 Independent Study II
Continuation of Independent Study I.

CS 698 Thesis I
Prerequisites: 15 credits and completion of all core courses. Petition to register must be approved by a supervising faculty member, the program coordinator, and the department chair. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

CS 699 Thesis II
Continuation of Thesis I.

English

E 600 English Language Workshop
Enrollment in this course is limited to and required of students who are not native speakers of English and who lack adequate background in English instruction. Students whose TOEFL scores are less than 560 (220 on the computer-based test) and/or students who enter the Graduate School following completion of an intensive English language program are required to take and pass this training course in the first term of enrollment at the Graduate School. The course emphasizes development of conversation, pronunciation, and composition skills, and includes orientation to the Peterson Library and instruction in writing a research paper. No credit.

E 634 Applied Linguistics
This course is designed for teachers of writing at all levels. It helps students develop insights into sentence structure and development which, in turn, is beneficial for transmitting systematic editing techniques at various school levels. The course focuses on sentence structure and touches on phonetics and language history. (See also ED 634.)

E 659 Writing and Speaking for Professionals
A practical, tool-oriented approach for professionals who need to perfect writing and speaking skills for career advancement or presentations in graduate courses. Students generate work-related writing/speaking assignments and negotiate learning contracts based on editing, writing, and speaking methods related to individual needs and objectives. (See also HU 659.)

Economics

EC 601 Macroeconomics and Microeconomics
A basic theoretical foundation for students who lack adequate background in economics. An introduction to and review of basic economic principles.

EC 603 Microeconomic Analysis
Prerequisites: EC 601, QA 604. Survey of the behavior and decision choices of individual economic agents (e.g., consumers, firms, and resource owners) under alternative market conditions, time horizons, and uncertainty.

EC 604 Macroeconomic Analysis
Prerequisites: EC 601, QA 604. Study of the performance and fluctuations of the economy, focusing on economic policies that affect performance. Topics include consumption and investment, the determinants of changes in wages and prices, monetary and fiscal policies, money, interest rates, the federal budget, the national debt, and interdependence and policy between countries.

EC 625 Industrial Relations
Survey of problems, strategies, and policies of management interactions with formal and informal labor organizations. Labor legislation, collective bargaining, productivity analysis, and arbitration are stressed, with emphasis on negotiating strategies and techniques.

EC 627 Economics of Labor Relations
Survey of labor economics using the tools of economic and institutional analysis. Emphasis on human resources and demographics pertaining to labor markets.

EC 629 Business and Society
Prerequisite: EC 601. Topics include forces shaping business institutions through emerging social, legal, ethical, and political issues such as pollution control, workplace issues, equal employment opportunity, product safety, and relations with external stakeholders. Also addressed, using lectures and cases, are laws and regulations that govern and restrict business activities.

EC 633 Managerial Economics
Prerequisites: EC 601, FI 601. Application of the major tools of economic analysis to problems encountered by management, presented using lectures and case studies. Topics include measurement of market demand, cost analysis, expenditure and production decisions, price determination in competitive markets (which include the entrepreneurial enterprise), and the allocation of capital and investment.

EC 641 International Economics
Prerequisite: EC 601. Examination of international trade, foreign exchange, and capital markets. Topics include national policy in an open economy, international policy coordination, and globalization.

EC 644 Managing in Global Markets
Prerequisites: EC 601, FI 601, MG 637, and MK 609. This course provides the student with an understanding of the effects of globalization on the economic environment and corporate operations. It examines multinational operations and the many adaptations management must undertake to successfully interact with the various global business environments. Topics are examined from both domestic and international perspectives and include the operational and strategic adjustments necessary for the multinational to navigate among the diverse and rapidly evolving cultural, political, economic, financial, operational, and ethical environments of global markets.

EC 665 Urban and Regional Economic Development
Prerequisite: EC 601. Techniques, methods of analysis, and models utilized in the development process. Emphasis on job creation, manufacturing assistance, free enterprise zones, and regional planning.

EC 670 Selected Topics
A study of selected issues of particular interest to students and instructor. May be taken more than once.

EC 679 Industrial Relations Seminar
Prerequisites: EC 625, EC 687, MG 637, and P 619, or permission of instructor. A seminar in industrial relations and the labor-management relations function of the modern work organization. The use of an integrated behavioral, economic, and legal approach permits an applied multidisciplinary synthesis of the employee relations function required in either nonunionized or unionized work organizations.

EC 687 Collective Bargaining
Recommended prerequisite: EC 625. Emphasis on contract negotiation, whether in a formal or informal bargaining scenario. Contract development covers wages, benefits, job security, management rights, equal opportunity, and grievance procedures. Additional time devoted to third-party settlements and the arbitration process.

EC 690 Research Project
Prerequisite: Permission of the instructor. A major independent research study/project carried out under faculty supervision.

EC 693 Internship
Prerequisites: 15 graduate credits and permission of program coordinator. A supervised work experience in a selected organization, arranged for credit and directed by a faculty advisor.

EC 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

EC 696 Independent Study II
Continuation of Independent Study I.

EC 698 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

EC 699 Thesis II
Continuation of Thesis I.

Education

Some course numbers in this field are followed by the suffixes "E" for elementary, "M" for middle grades/middle school, and "S" for secondary.

ED 600 Student Teaching
This consecutive 13-week practicum satisfies the requirement of the State of Connecticut for teacher candidates

to demonstrate attainment of the appropriate Connecticut Teaching Competencies in a culminating clinical activity of supervised student teaching. 6 credits.

ED 601 Introduction to Education

This course introduces students to the field of education. Students learn about the Connecticut Teaching Competencies classroom management techniques and are given a broad overview of school-related issues. 1 credit, to be taken in advance of first trimester of study.

ED 603 Human Growth and Development

A study of the major aspects of human development from conception through adolescence, presenting the important theories and research methods of the field and tracing the physical, cognitive, psychological, and social development of each chronological division.

ED 604 Educational Psychology

Content emphasizes the application of psychological principles and research results to the teaching-learning process. Includes learning principles, development, planning instruction, evaluating student performance, classroom management, and motivation.

ED 605 Students with Special Needs

Provides prospective educators with an understanding of methods used to identify, diagnose, and teach exceptional students in regular and special education classrooms. Describes the developmental and learning characteristics of exceptional students; reviews educational and supportive services; and examines laws impacting the education of students with special needs.

ED 606 History of American Education

Survey of the relationship between education and American culture through a focused study of the history of public schooling in the United States. Study of events, developments, and policies that have shaped American education from colonial times through the first century of American independence, the Progressive reform era, and the Depression era to the current day. 2 credits.

ED 608 Child Development

A study of the physical, cognitive, and social development of children, with special emphasis on major theories and research methods.

ED 609 Adolescent Development

A study of the physical, cognitive, and social development of adolescents, with special emphasis on major theories and research methods.

ED 610 Neuroscience and Instructional Strategies

The course reviews the legacy of learning theories, relates them to the most recent findings from neuroscience about the developmental processes of the brain, and connect them to the ways in which the brain creates neuronal pathways for learning about themselves, their world, and many of the subjects they study/teach in their classrooms.

ED 611 Learning and Intelligence

Examination of the dynamics of the major explanations of learning and intelligence; learning as the core of behavior.

ED 612 Curriculum Design

Prerequisite: Permission of the department chair. Application of theoretical knowledge of curriculum to real course planning. Investigation and analysis of current educational programs in terms of curricular theory as well as training for teachers in basic curriculum development techniques.

ED 614 Philosophy of Education

A critical analysis of education in contemporary society as reflected in the thinking of modern and early philosophers. (See also PL 614.)

ED 615A/B/C/D/E Strategies in Mathematics Content

Provides current and future teachers with specialized training in teaching specific content areas of mathematics. 1 credit for each content area.

ED 615A Geometry I

ED 615B Geometry II

ED 615C Graphing Calculators

ED 615D Discrete Methods

ED 615E Remedial Mathematics

ED 616A/B/C/D/E Strategies in Science Content

Provides current and future teachers with specialized training in teaching specific content areas of science. 1 credit for each content area.

ED 616A Chemistry

ED 616B Physics

ED 616C Earth Science

ED 616D Biology

ED 616E Integrating Mathematics and Science

ED 617A/B/C/D/E Strategies in Social Science Content

Provides current and future teachers with specialized training in teaching specific content areas of the social sciences. 1 credit for each content area.

ED 617A Constitutional Law

ED 617B Political Science

ED 617C Governance

ED 617D Local History and Historical Methods

ED 617E Geography

ED 618A/B/C/D/E Strategies in Business Content
Provides current and future teachers with specialized training in teaching specific content areas of business. 1 credit for each area.

ED 618A Computer Technology

ED 618B Software Applications

ED 618C International Business

ED 618D Economics

ED 618E Marketing and Advertising

ED 619A/B/C/D/E Strategies in English Language
Provides current and future teachers with specialized training in teaching specific content areas of the English language. 1 credit for each content area.

ED 619A Humanities

ED 619B Research Writing

ED 619C Journalism

ED 619D Poetry

ED 619E Drama

ED 620 Seminar in Multicultural Issues
A series of lectures, dialogues, and discussions to promote understanding of the diverse ethnic, cultural, and economic groups composing American society, as they interact in the schools. 1 credit.

ED 621E Teaching Strategies in Mathematics
Introduction to current concepts and trends in the field of mathematics instruction; focuses on new materials, methods, and strategies that assist teachers as they plan, present, and evaluate mathematics education.

ED 621M/S Teaching Strategies in Mathematics
Introduction to current concepts and trends in the field of mathematics; focuses on new materials, methods, and strategies that assist teachers as they plan, present, and evaluate mathematics education.

ED 622E Teaching Strategies in Science
Introduction to current concepts and instructional techniques in the field of science teaching; focuses on providing teachers with the skills, knowledge, and methodologies for teaching science.

ED 622M/S Teaching Strategies in Science
Introduction to current concepts and instructional techniques in the field of science teaching; focuses on providing teachers with the skills, knowledge, and methodologies for teaching science.

ED 623E Teaching Strategies in Social Studies
Introduction to current concepts and trends in the field of social studies instruction; focuses on new materials, methods, and strategies that assist teachers as they plan, present, and evaluate social studies education. 2 credits.

ED 623M/S Teaching Strategies in Social Studies
Introduction to current concepts and trends in the field of social studies instruction; focuses on new materials, methods, and strategies that assist teachers as they plan, present, and evaluate social studies education.

ED 624 Teaching Strategies in Business
Focus is on the strategies for teaching business concepts and practices to secondary students.

ED 625E Teaching Strategies in Children's Literature and Language Arts/Elementary
Introduction to materials and methodologies used to develop the reading, writing, listening, and speaking skills of students, with special emphasis on the wealth of literature available for elementary school students.

ED 625M Teaching Strategies in Literature and Language Arts/Middle School
Introduction to materials and methodologies used to develop the reading, writing, listening, and speaking skills of students, with special emphasis on the wealth of literature available for middle school students.

ED 625S Teaching Strategies in Language Arts/Secondary School
Introduction to the materials and methodologies used to develop the reading, writing, listening, and speaking skills of secondary school students.

ED 626E Strategies for Teaching Reading and Language Arts in Elementary School
Introduction to current concepts and trends in reading instruction in the elementary school, including practical reading and writing assessment techniques. Special emphasis on the literacy-based development of beginning and skilled readers and the diversity of student abilities, cultural backgrounds, and language.

ED 626M Reading in the Content Areas
Introduction to current concepts and trends in content-area reading in the

middle school. Students will appreciate a wide range of print and nonprint texts that can be used to build an understanding of the cultures of the United States and the rest of the world. Fiction, nonfiction, classic, and contemporary works are studied. 2 credits.

ED 626S Reading in the Content Areas

Introduction to current concepts and trends in content-area reading in the secondary school. Students will appreciate a wide range of print and nonprint texts that can be used to build an understanding of the cultures of the United States and the rest of the world. Fiction, nonfiction, classic, and contemporary works are studied. 2 credits.

ED 627 Reading and Writing Across the Curriculum

Designed for teachers in the secondary school content areas. Focuses on training teachers to implement a variety of instructional methods related to developing writing skills across disciplines.

ED 628 Reading Diagnosis and Remediation

Examines both traditional and innovative means of assessing reading strengths and needs as well as corrective instruction. Fundamental principles of diagnosis and instruction in reading are presented, providing a philosophical basis for working with reading students, whether in regular classrooms, special education settings, remedial reading classes, or reading clinics.

ED 629 Strategies for Teaching Modern World Languages in PK-12 Classrooms

Course designed to prepare candidates to teach modern world languages in the PK–12 schools; includes current research and trends in foreign language pedagogy and curricular models for different age groups. Addresses the Standards for Foreign Language Learning's Five Cs: Communication, Cultures, Connections, Comparisons, and Communities. Emphasizes materials, instructional methods, and lesson planning for teaching the four language skills (speaking, writing, listening comprehension, and reading) and culture in an integrated way.

ED 630E Children's Literature

Provides knowledge of children's publications; introduces students to the wealth of literature available for young readers and its potential for enhancing classroom instruction. Selection of interesting and well-written materials based on knowledge of human development to motivate, expand, and diversify instruction. 2 credits.

ED 630S Reading and Adolescent Literature

Provides knowledge of young adult publications; introduces students to the wealth of literature available for adolescent readers and its potential for enhancing classroom instruction. Selection of interesting and well-written materials based on knowledge of human development to motivate, expand, and diversify instruction.

ED 632 Content Updates

Focuses on the knowledge bases required for teaching in the specific content areas and major disciplines. 1–3 credits; may be taken more than once, limited to 6 credits in any one content area.

ED 633 Visual and Performing Arts in the Elementary Classroom

Introduction to current ideas and instructional techniques for the visual and performing arts as they pertain to an elementary school classroom. Focuses on providing teachers with skills, knowledge, and methodologies for teaching art, music, and theater. Students are asked to attend a series of lectures or performances at local theaters, concert halls, or museums. 1–3 credits.

ED 634 Applied Linguistics

This course is designed for teachers of writing at all levels. It helps students develop insights into sentence structure and development which, in turn, is beneficial for transmitting systematic editing techniques at various school levels. The course focuses on sentence structure and touches on phonetics and language history. (See also E 634.)

ED 635 History of Science

This course introduces students to the history of science from the Scientific Revolution to the present. It deals with the development of new ideas and the contexts in which they are constructed. It will assist students to understand how people developed ideas to interpret nature and why they changed those ideas.

ED 636 Early Literacy

This course examines the literacy skills and processes that reflect current research and best practices in the field of early literacy instruction. The course summarizes the research on how children learn to read, and reviews the literacy skills and competencies children need to acquire to become successful readers and writers. Teacher candidates learn effective classroom instructional strategies and assessment practices, including the components of a comprehensive and balanced literacy program in the primary grades.

ED 637 Strategies for Teaching Art

Prerequisite: Permission of the Education Department. Introduction to current concepts and trends in the field of art education with particular focus on new materials, methods, and teaching strategies to assist teacher candidates as they plan, present, and evaluate art education.

ED 638 Strategies for Teaching Music

Prerequisite: Permission of the Education Department. Introduction to current concepts and trends in the field of music education with particular focus on new materials, methods, and teaching strategies to assist teacher candidates as they plan, present and evaluate music education.

ED 639 Second Language Acquisition in PK–12 Classrooms

This course prepares teachers to support the acquisition of a second language in contemporary world language classrooms. Investigates theories of second language acquisition and their relationship to instruction; emphasizes the characteristics of language learners across the grade spans.

ED 641 Teaching English-Language Learners

This course prepares teachers to support the acquisition of English as a second language in contemporary classrooms. Emphasizes theories of second language acquisition; characteristics of language learners, including young children; and culturally responsive pedagogies for promoting language and literacy development across the grade spans.

ED 642 Current Instructional Trends

Prerequisite: Permission of the Department. This course updates classroom teachers' knowledge of instructional methodologies in particular content areas. Topics vary depending on the content area and major disciplines. 1–3 credits; may be taken more than once; limited to 6 credits in any one content area.

ED 650 Law for Teachers

The primary focus of this online course is current legal cases and statutes that impact teachers and students in schools and classrooms. Includes a brief look at the historical context in which these laws evolved, as well as current federal and state mandates.

ED 654E/M/S Organization and Structure in the Schools

Study of the structural arrangements and organizational practices in the classroom and in the school unit at the different levels of education: elementary, middle school, and secondary.

ED 655 Teaching the Millennial Student

Explores the issues and trends in teaching in the millennium. Discusses strategies for engaging digital-age students in real-world and technology-based learning experiences. Includes topics related to preparing students for success in the millennium, such as media literacy and popular culture, information and communication technologies, and critical thinking.

ED 656 Adaptive Teaching

Introduces teachers to theory and practice in adaptive teaching. Includes tailoring instruction to individual differences, and teaching motivational and self-regulated strategies that enable learners to benefit from the range of instruction commonly implemented in group settings. Current instructional practices, such as differentiation, dynamic assessment, and response to intervention are discussed.

ED 661 Job Readiness and the Labor Market for Secondary School Students

This course introduces educators to the theories and principles of cooperative work education. It discusses the implementation of a cooperative work experience for high school students.

ED 670/671 Selected Topics

Study of selected and timely issues of particular interest to the student.

ED 680 Contemporary Issues

Seminar on current issues related to American education and the differing viewpoints expressed. While the content varies from year to year in accordance with the varied interests of educators and the general public, the basic theme is the exposition of fundamental and present concerns in education.

ED 681 Principles of Classroom Management

This course introduces to the basic principles of effective classroom and behavior management. The course examines historical and contemporary theories, classroom models, and case study analyses. The importance of contextual variables such as instructional goals, socioeconomic levels, cultural imperatives, and students' cognitive skills are also examined.

ED 682 Measurement, Assessment, and Evaluation

Trains educators to construct reliable and valid measurements for a variety of pedagogical situations; to identify major standardized testing instruments; to use test results efficiently and effectively; and to design a variety of assessment strategies appropriate to students, staff, and functions. 1–3 credits.

ED 683 Computer Applications for Teachers

This online course provides or enhances a working knowledge of educational computing in order to evaluate educational software and create instructional materials for the classroom. Relates students' knowledge of pedagogy and curriculum to the creative use of instructional technology. 1–3 credits.

ED 685 Teacher Research

An in-depth analysis of research on teaching practices, including the study of quantitative and qualitative research techniques. Students are required to conduct mini research

projects and to design a research proposal for a final project.

ED 687 Field Project I
An individualized project related to the classroom, to the curriculum, or to school methodology. 1–3 credits.

ED 688 Field Project II
An individualized project related to the classroom, to the curriculum, or to school methodology. 1–3 credits.

ED 689 Research Design
This course introduces students to the techniques of educational research. Students will learn how to design a research project, how to read and critique professional journal articles, and how to design a research project appropriate for elementary, middle, or secondary students. 2 credits.

ED 690 Research Project
Prerequisite: ED 689. Independent study under the supervision of an advisor for completion of a school-based project (designed in ED 689) that satisfies the requirement of a final project for obtaining the graduate degree. 1–3 credits.

ED 691 Capstone Project
This course is required for those students who do not serve as interns. Students will research and prepare a teaching portfolio. Non-interns must show evidence of having served 100 hours of participation in a child-centered activity. Students will not receive credit for both ED 691 and ED 694. 2–3 credits.

ED 692I/692C Field Experience I
Practicum intended to provide graduate students with field experiences in area schools under university supervision. All students are expected to attend seminars. Students participating as interns register for ED 692I, and Capstone students (non-interns) register for ED 692C. 1 credit.

ED 693I/693C Field Experience II
Continuation of Field Experience I. Interns register for ED 693I, and Capstone students (non-interns) register for ED 693C. 1 credit.

ED 694I/694C Field Experience III
Continuation of Field Experience II. All students are expected to complete a teaching portfolio. Interns register for ED 694I, and Capstone students (non-interns) register for ED 694C. 2 credits.

ED 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty. 1–3 credits.

ED 696 Independent Study II
Continuation of Independent Study I. 1–3 credits.

ED 698 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

ED 699 Thesis II
Continuation of Thesis I.

Electrical and Computer Engineering

EE 600 Electromagnetics
Prerequisite: Permisison of program coordinator. Basic electromagnetic theory including static fields of electric charges and the magnetic fields of steady electric currents. Fundamental field laws including Coulomb's Law, Gauss's Law, Biot Savart's Law and Ampere's Law. Maxwell's Equations, scalar and vector potentials, Laplace's equation and boundary conditions. Magnetization and polarization. This course is intended for those students whose undergraduate background did not emphasize this content.

EE 601 Digital Systems
Prerequisite: Permission of program coordinator. Course focuses on sequential logic design. Both synchronous and asynchronous techniques are covered with an emphasis on controller-based modular design. Design with a hardware description language. Advanced topics to be covered as time permits. Course includes laboratory activity, and is intended for those students whose undergraduate background did not emphasize this content.

EE 602 Computer Engineering
Prerequisites: Permission of program coordinator. Introduction to the architecture of digital computers, stored program concept, instruction processing, memory organization, instruction formats, addressing modes, instruction sets, assembler and machine language programming, direct memory access, bus structure, and control signals. Course includes laboratory activities, and is intended for those students whose undergraduate background did not emphasize this content.

EE 603 Discrete and Continuous Systems I
Prerequisite: Linear system Analysis. This course exposes the students to the tools and mathematical techniques used in the analysis of continuous-time and discrete-time signals and systems. Topics include a thorough coverage of Fourier series, Fourier Transform, Hilbert transform, Laplace transform, Z transform, discrete-time Fourier transform (DTFT), discrete Fourier transform (DFT), fast Fourier transform (FFT), and state-space analysis.

EE 604 Discrete and Continuous Systems II
Prerequisite: EE 603 and M 611 or consent of instructor. Proficiency in Mathematica, or MATLAB is desirable. Mathematical review: Quadratic

forms, convergence, matrix calculus, solutions to systems of linear equations. Nonlinear state equation representation of physical systems: linearization of nonlinear state equations about trajectories, time-varying state equation solutions, Peano-Baker series, existence, iniquencess, complete solution, time-varying state transition matrix properties, time-invariant case. Stability: uniform stability, uniform exponential stability, Lyapunov stability criteria.

EE 605 Computer Controlled Systems

Prerequisites: EE 604 and EE 650. Disturbance models, design, analog design, state space design methods, pole placement design based on input-output models, optimal design methods (state space approach), optimal design methods (input-output approach), identification, adaptive control, implementation of digital controllers, reduction of the effects of disturbances, stochastic models of disturbances, and continuous time stochastic differential equation.

EE 606 Robot Control

Prerequisite: EE 605. Orientation coordinate transformations, configuration coordinate transformations, Denavit-Hartenberg coordinate transformations, D-H matrix composition, inverse configuration kinematics, motion kinematics, force and torque relationships, force and moment translation, trajectories, coordinated motion, inverse dynamics, position control, and feedback systems, performance measures, PID control, inverse dynamic feedforward control, nonlinear control.

EE 607 Adaptive Control

Prerequisites: EE 605, EE 650, or consent of instructor. An introduction to adaptive control methods and their application. The identification and control of linear deterministic time-invariant dynamical systems with parametric uncertainty are emphasized. Topics such as real-time parameter estimation, model reference adaptive systems, robust adaptive control, and implementation issues are covered.

EE 610 Networking I

Discussion of TCP/IP and OSI reference models, LANS and WANS, different topologies, the internet structure, Data and signals, sampling, bandwidth, transmission, impairment, digital and analog transmission, multiplexing and spreading, guided and unguided media. Switching and virtual circuit networks, telephone networks, DSL, Cable modem. Error detection and correction, hamming codes, CRC, checksums, lab experiments.

EE 611 Networking II

Prerequisite: EE 610. Network layer design, routing algorithms, congestion control algorithms, transport layer issues, application layer, network security, lab experiments.

EE 615 Introduction to Computer Logic

Prerequisite: Any one of CS 604 through CS 610 (or equivalent). Introduction to logic elements and to their application in digital networks for processing numerical data. The course deals with analysis and design techniques of combinational and sequential networks and includes a discussion of logic variables, switching functions, optimal realizations, and multivariable systems. Design examples will include logic circuits for addition, multiplication, counting, parity generation, and detection.

EE 620 Fuzzy Logic and Control

Prerequisites: Basic linear algebra, probability, and systems theory. Introduction to fuzzy logic and fuzzy control systems. Basic fuzzy logic concepts are covered, followed by a selection of fuzzy applications from the literature. Topics include fuzzy sets, fuzzy numbers, fuzzy relations, fuzzy logic and appropriate reasoning, fuzzy rule-based systems, fuzzy control, fuzzy classification, and fuzzy pattern recognition. Homework consists of computer exercises and simulations; a final project is required.

EE 630 Electronic Instrumentation

Prerequisite: Permission of instructor. Design of modern electronic instrumentation. Circuit and system examples; evaluation and design techniques. Emphasis on practical applications including design theory and the circuit techniques used in linear integrated devices. Variety of electronic instrumentation including computer interfaces, signal conditioners, waveform generators and shapers, filters, V/F, A/D, D/A converters, and other special-purpose circuits.

EE 634 Digital Signal Processing I

Prerequisite: EE 603. A study of the theories of digital signal processing and their applications. Topics include discrete time signals, the Z-transform, the discrete Fourier transform, the FFT, homomorphic signal processing, and applications of digital signal processing.

EE 635 Digital Signal Processing II

Prerequisites: EE 634 and knowledge of programming in MATLAB or other high-level language. Wiener filter theory, linear prediction, adaptive linear filters using gradient estimation, Least Mean Squares (LMS) algorithm, least squares formulation and the Recursive Least Squares (RLS) algorithm, fast implementations, recursive adaptive filters, lattice structures, eigenstructure methods for spectral estimation elements of adaptive nonlinear filtering, and applications.

EE 637 Power Systems Engineering

Prerequisite: Permission of instructor. Concepts and methods of analysis and design of modern power systems. Includes the network representation of power systems, matrix methods, symmetrical components, and the use of the computer in the solution of problems such as short-circuit fault calculations, load flow study, economic load dispatching, and stability. Other topics may include protection, relaying, or transmission system design.

EE 639 Electric Power Distribution

Prerequisite: EE 637 or equivalent. Structure of electric power distribution, distribution transformers, subtransmission lines, substations, bus schemes, primary and secondary systems, radial and loop feeder designs, voltage drop and regulation, capacitors, power factor correction and voltage regulation, protection, buses, automatic reclosures, and coordination.

EE 645 Introduction to Communication Systems

The analysis and design of communication systems. Includes analog and digital signals, sampling, quantization, and signal representation. Analog and digital modulation, pulse code modulation, delta modulation, time and frequency multiplexing. Noise in communication systems.

EE 646 Digital Communications

Prerequisite: EE 645. Formatting and baseband transmission, bandpass modulation and demodulation, communication link analysis, and channel coding synchronization.

EE 648 Microwave Engineering

Prerequisites: Undergraduate electromagnetics; programming experience, preferably in MATLAB, or permission of instructor. This course is designed to familiarize students with microwave components and their operating principles. The course covers transmission lines, including microstrip and coplanar waveguides, impedance matching, S parameters, Smith chart, couplers/dividers, waveguides, EM simulators, and antennas. Some homework assignments may require use of computer-aided design software.

EE 649 Wireless Communications

Prerequisites: Undergraduate electromagnetics; programming experience, preferably in MATLAB, or permission of instructor. The fundamental concepts and applications of wireless communications. Topics: path loss and fading, mobile radio channel, channel capacity, digital modulation scheme, coding, and multiple access.

EE 650 Random Signal Analysis

A study of the theory of random signals and processes. Includes correlations, spectra, stationarity, ergodicity, and systems with random inputs. Hilbert's transforms, shot noise, thermal noise, Markoff processes, mean square estimation, spectral estimation, and entropy.

EE 652 Design of Digital Filters

Techniques in the analysis and design of digital filters. Digital filter terminology and frequency responses. FIR filter design. IIR digital filter design including Butterworth and Chebyshev low-pass, high-pass, bandpass, and bandstop filters. The DFT and IDFT; FFT algorithms.

EE 653 Digital Image Processing

Prerequisites: Working knowledge of signal analysis and linear algebra, programming experience (languages such as MATLAB, C.net, java, C++), or permission of instructor. Fundamental concepts and applications of image processing and analysis. Topics include image formation, imaging geometrics, image transform theory and restoration, encoding, and compression.

EE 656 Hardware Description Language

General structure of (VHSIC) Very High Speed Integrated Circuit, Hardware Description Language (VHDL) code; entities and architecture in VHDL; signals, variables, data types; concurrent signal assignment statements; processes; if, case, and loop statements; components; package; functions and procedures; slices; attributes; generate statements; blocks; projects on design of combinational and sequential circuits using VHDL.

EE 657 VLSI Design

Complex logic gates, flip-flop, cascade voltage switch logic, differential split level logic, Schmitt trigger, dynamic logic gates, and clocked CMOS logic, Domino logic, SRAM and DRAM, VCO, Voltage generator, and lab activities.

EE 658 Embedded Applications

Design of advanced embedded microcontroller applications. Interface and control of several devices and buses. Classwork focuses on laboratory exercises and projects.

EE 670 Selected Topics

Prerequisite: Permission of instructor. A study of selected topics of particular interest to students and instructor. Course may be taken more than once.

EE 680 Fiber Optic Communications

The fundamentals of fiber optic technology and optical systems, light emission and detection, single- and

multi-mode fibers, LED and semiconductor lasers, optical detectors, signal degradation, power launching and coupling, connectors, splicers, geometric optics, ray tracing, and system requirements for point-to-point link analysis. Includes selected laboratory experiments.

EE 682 Computer Architecture
Prerequisite: EE 604 or equivalent. Review of large system design, arithmetic and logical operations, ALU and design of control unit, microprogramming, RISC architecture, memory organization, cache memory, system organization, and processor design using bit-slice ALU.

EE 685 Optimization of Engineering Systems
Prerequisite: EE 604. The calculus of variations, functionals, linearity of functionals, closeness of functions, the increment of a functional, and maxima and minima of functionals. The fundamental theorem of the calculus of variations, the variational problem, Euler-Lagrange equations, boundary conditions, the transversality conditions, piece-wise-smooth extremals, and the first and second carrier conditions. Lagrange multiples, the Hamiltonian canonical equations, the control problem, the problems of Lagrange and Mayer, Strong's variation, Legendre conditions, Weierstrass excess function, and Pontryagin's minimal principle.

EE 690 Research Project
Prerequisites: 15 graduate credits and written permission of program coordinator. Independent study under the guidance of a faculty advisor, such study terminating in a technical report of academic merit. Research may constitute a survey of a technical area in electrical engineering or may involve the solution of an actual or hypothetical technical problem.

EE 695 Independent Study I
Prerequisite: Permission of instructor. A planned program of individual study or research under supervision of a faculty member.

EE 696 Independent Study II
Continuation of Independent Study I.

EE 697 Thesis I
Prerequisites: Completion of 15 credits of graduate work; student must have submitted a thesis proposal and performed a literature search in the preceding trimester. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

EE 698 Thesis II
Continuation of Thesis I.

EE 699 Thesis III
Continuation of Thesis II.

Engineering Management

EM 604 Concepts of Engineering and Quality Management
Introduction to contemporary engineering management concepts as they appear in organizations. Review of the challenges faced by such organizations, and the various methodologies in use to meet these challenges. Review of the complex and dominant role that quality plays in creating excellent customer-supplier relationships. Discussion of quality goals and management strategies to achieve them.

EM 607 Decision-Making Under Uncertainty
Prerequisite: Basic knowledge of differential calculus. Concepts of probability and applications of probability theory for dealing with uncertain situations in engineering and technology management. Topics include random variables, probability functions, expectations, discrete and continuous distributions, probability computation, summary measure, data presentation schemes and their applications in process control, forecasting, lead-time estimation, queues, and customer demand functions. Excel and other software are used.

EM 609 Applied Statistics for Quality and Engineering Management
Comprehensive survey of the many roles of statistics in Total Quality Management, quality assurance, simulation, experimentation, risk assessment, and performance evaluation. Topics include confidence intervals, statistical process control, analysis of variance, regression, and nonparametric methods and their applications in engineering management. Excel and other software are used. Deming, Juran, Taguchi, and ASQ contributions are presented as engineering management resources.

EM 613 Organizational Change and Development
This course is targeted towards managers and other change agents within organizations. Organizational change fosters the development of competency in skills necessary during all phases of the planned change process, from diagnosis to interventions to evaluation. Organizational change issues are critically examined, and case studies, exercises, and assessments are utilized to better understand change from organizational, group, and individual levels.

EM 615 Applied Marketing for Engineers and Operations Managers
Prerequisite: Graduate standing. An intensive study of modern marketing fundamentals in a diverse global

economy; a study of the decision-making problems encountered by marketing managers, using lectures and case studies. 2 credits.

EM 627 Value Engineering and Design

Prerequisite: EM 609 or equivalent. Course provides framework for optimal design based on internal and external issues related to value-added criteria. Topics to be covered include function analysis and costing, the technology roadmap, and techniques involving customer-oriented product concepts in the areas of performance, maintenance/service, user friendliness, and quality. Case studies and real-world situations are presented.

EM 628 Six Sigma Quality Planning

Prerequisite: EM 609 or equivalent. Review of Six Sigma and its role in managing quality at all levels of an organization, including its relationship to lean initiatives. Presentation of Six Sigma history, philosophy, tools, processes, and significant case studies. Projects utilize the techniques to generate "hands-on" experience.

EM 630 Project Management

Prerequisite: EM 609 or equivalent. Review of CPM-PERT methodologies and their use in managing complex engineering-related projects. Analysis of bias in estimating and in forecast preparation. Strategies for achieving on-time task completion and minimizing critical chains. 2 credits.

EM 639 Achieving Optimal Operations

Prerequisites: EM 604 and EM 609 or equivalent. Concepts of lean production, Japanese production systems, push vs. pull production systems, benchmarking, and evaluation schemes, schedule management, overcoming bottlenecks, and performance and productivity improvement techniques applicable to service and manufacturing systems. Workforce issues (affairs) including union acceptance, productivity, and workforce education, training and compensation.

EM 641 Supply Chain Management

Introduction to global supply chain management in support of manufacturing and technical services, with emphasis on procurement, use of web-based information technology, logistics, and integration with JIT scheduling at the customer level.

EM 673 Special Topics in Engineering Management

Prerequisite: Permission of the program coordinator. Current topics relevant to engineering management but with a focus on specific themes including, but not limited to, technology leadership and entrepreneurship, conflict management and negotiation, safety organization and management, corporate law (contracts and patents), and environmental laws and regulations.

EM 681 Simulation Techniques and Applications

Prerequisites: EM 609 and EM 639 or equivalent. Review of the role of computer simulation in analyzing complex systems and operations. Emphasis on problem formulation, model building, input and output data analysis, experimentation and evaluation of alternative designs/processes in complex systems/operations. Case studies of successful implementations are reviewed together with guidelines for using state-of-the-art simulation software (ARENA is currently used) to solve system problems.

EM 690 Research Project

Prerequisite: 15 graduate credits or permission of the program coordinator. Independent study and research focused on a problem of interest in either a work environment or in a community or non-profit organization. Guided by a faculty advisor, a project report is developed that describes the problem, outlines the scope of work, and presents recommendations and solutions in a professional manner. An oral presentation is made to program colleagues — a capstone experience ending the program of study.

Environmental Science

EN 600 Environmental Geoscience with Laboratory

Study of geological systems important in understanding the causes of and solutions to environmental problems. Includes basic geological principles, examination of natural hazards (their causes and mitigation), and mineral, energy, and water resources. Laboratories include practical exercises, data collection, problem solving, virtual field trips, and case histories. Some weekend field trips may be required. Laboratory fee; 4 credits.

EN 601 Principles of Ecology with Laboratory

Presentation of current topics in various fields of ecology including community, population, ecosystem, and landscape ecology. Particular emphasis on those areas related to applied ecology. Field trips and laboratory sessions focus on a quantitative evaluation of ecological systems in terrestrial and aquatic habitats and on methods used in ecological assessment. Laboratory fee; 4 credits.

EN 602 Environmental Effects of Pollutants

Prerequisites: EN 600, EN 601, and undergraduate organic chemistry or graduate introduction to environmental chemistry CH 600. A survey of the demonstrated and suspected effects of air, water, and other pollutants on natural systems and on human welfare. Methods of studying and assessing effects are also presented.

EN 603 Wetlands Ecology with Laboratory

Prerequisites: EN 600, EN 601. This course covers the ecology of saltwater and freshwater wetland systems. Linkages between the biotic, hydrologic, and chemical components of various wetland types are emphasized. Wetland delineation, functional assessment of wetlands, and wetland creation and restoration are among the topics to be discussed. Field trips and laboratory sessions focus on a quantitative evaluation of the hydrology, soils, and biotic communities of various wetland types. Laboratory fee; 4 credits.

EN 604 Ecology of Inland Waters

Prerequisites: EN 600, EN 601. Advanced study of ecological processes of inland waters, both lotic and lentic. Some weekend field trips, or acceptable alternative, required.

EN 605 Marine and Estuarine Ecology

Prerequisites: EN 600, EN 601. Advanced study of ecological processes of estuaries and marine habitats. Some weekend field trips, or acceptable alternatives, required.

EN 606 Environmental Data Analysis

Prerequisites: 15 graduate credits and a course in statistics, or permission of instructor. The application of analytic techniques to environmental data in the areas of applied ecology, environmental geology, and chemistry. These include applied univariate and multivariate statistics as well as geostatistical methods. Introduction to microcomputer software available for environmental analyses.

EN 607 Environmental Reports and Impact Assessment

Prerequisites: 21 graduate credits including EN 600, EN 601, and CE 606. A study of the EIS/EIA process including the regulatory framework, how to prepare environmental reports and impact assessments, formats required for EIS and other common reports, data collection and presentation, planning and carrying out assessments, and text preparation. Some fieldwork may be required.

EN 608 Landscape Ecology

Prerequisites: EN 600, EN 601. In-depth study of the characteristics and dynamics of terrestrial and aquatic ecosystems on a regional scale. Spatial relationships between ecosystems are examined with regard to natural ecologic and geologic functions and alterations due to human activities. Applications to land-use planning, resource management, conservation, and other environmental concerns are addressed via class projects.

EN 609 Data Analysis in the Environmental and Biological Sciences

Prerequisites: 9 graduate credits and a previous course in statistics, or permission of instructor. The application of data analysis techniques in the environmental (applied ecology, environmental geology and chemistry) and biological (molecular biology, and toxicology) sciences. These include applied univariate and multivariate statistics as well as geostatistical and non-detect methods. Extensive use of different types of computer software for data analyses.

EN 610 Environmental Health

Prerequisite: EN 601 or undergraduate biology major. Principles of public health with general emphasis given to environmental factors such as air and water pollutants, legal standards, and preventive measures and their relationships to public health.

EN 612 Epidemiology

An introduction to the principles and methods of epidemiology. Concepts of disease, analysis of morbidity and mortality, as well as observational and experimental techniques are considered. Illustrative examples concentrate on environmental issues.

EN 613 Radioactivity and Radiation in the Environment

Prerequisites: EN 600 and CH 601, or permission of instructor. Course covers the basic principles of nuclear structure and radioactivity; the interaction of radiation with matter and biological effects of radiation; natural and man-made sources of radiation in the environment. The second half of the course focuses on long-term environmental effects of radiation accidents (e.g., Chernobyl and others) and the problems of nuclear waste disposal, plutonium inventories from nuclear weapons, natural radon in buildings, and similar concerns. (See also PH 613.)

EN 615 Toxicology

Prerequisite: Introductory chemistry. Introduction to environmental and industrial toxicology; toxicologic evaluation; the modes of entry, absorption, and distribution of toxicants; the metabolism and excretion of toxic substances; interactions between substances in toxicology; toxicologic data extrapolation; particulates; solvents and metals; agricultural chemicals (insecticides and pesticides); toxicology of plastics; gases; food additives; plant and animal toxins; carcinogens, mutagens, and teratogens.

EN 616 Human Health and Environmental Risk Assessment

Prerequisites: EN 601, CE 606, and EN 615. Introduction to the application of human health and environmental risk assessment by environmental agencies. Principles of environmental risk assessment, legislative mandates for risk assessment, guidance documents, case studies, analysis, and assessment procedures. Emerging developments in the field are reviewed through class projects.

EN 617 Subsurface Assessment

Prerequisites: EN 600, CH 601, and CE 606. Introduction to conducting subsurface contamination assessments. Includes related environmental regulations and liabilities, site hydrogeology, chemical characterization of contaminants, field methodologies, risk assessments, and site contamination remediation. Some fieldwork required.

EN 618 Hazardous Materials Management

Prerequisites: CE 606 and undergraduate organic chemistry or graduate introduction to environmental chemistry (CH 600). The multidisciplinary facets of managing hazardous materials and wastes. Integrates specialized knowledge from the fields of environmental biology, chemistry, engineering, hydrogeology, and public health in the techniques used to maintain compliance with environmental standards. Includes regulatory framework, practical exercises, and concepts of sound practices of hazardous waste management.

EN 620 Advanced Environmental Geology

Prerequisite: EN 600 or undergraduate course in geology or permission of instructor. Qualitative and quantitative examination of the application of geology to environmental problems, including natural hazards and their remediation, site selection for various types of land uses, geology of waste disposal sites, and natural resource evaluation. A class project for a local government or environmental agency will demonstrate practical application of these principles and will be used to examine the process of project planning and management, generation and use of geologic data, and report preparation and presentation. Laboratories and some weekend fieldwork required. 4 credits.

EN 621 Hydrology

Prerequisite: Undergraduate course in physics, geology, hydraulics, or limnology, or permission of instructor. Lectures cover basic hydrologic theory including nature and chemical behavior of water, precipitation and evapotranspiration, interception, surface water, groundwater supply and treatment, and water law. Other topics may include irrigation, flood control, karst hydrology, and water chemistry. Required laboratories cover field measurement, sampling, and problem-solving techniques. Some weekend fieldwork required. 4 credits.

EN 622 Groundwater Geology

Prerequisite: EN 600 or EN 621 or CE 620, or permission of instructor. Physical and chemical behavior of water occurring in rock and soil (groundwater). Covers the geologic environments in which groundwater exists, groundwater movement and chemistry, karst hydrology, use of groundwater as a water supply, groundwater field investigations and testing, contaminant transport in groundwater, and the nature and use of groundwater flow and contaminant models. Laboratories include practical experience in field techniques (drilling, geophysical, well, logging, etc.), modeling, and data analysis. 4 credits.

EN 625 Geomorphology

Prerequisite: EN 600, or a college-level course in physical geology or geography, or permission of instructor. Study of landforms and the processes that produce them, such as the operation of erosional and depositional processes in a variety of geologic settings (fluvial, coastal, glacial, periglacial, karst, and arid). Also covers the relationship of landforms and processes to the solution of environmental problems. Lectures cover processes; laboratories focus on landform recognition and geomorphic process interpretation using maps and aerial photographs. Two required field trips (one 2-day and one 3-day) with shared transportation and costs. 4 credits.

EN 626 Glacial Geology

Prerequisite: EN 600 or EN 625, or a college-level course in physical geology or geography, or permission of instructor. Glacial processes, landforms, materials, and history. Relationships between various glacial landforms (identifiable on topographic maps) and the materials that comprise them. Two required field trips in New England (one 1-day and one 2 1/2-day) with shared transportation and costs.

EN 627 Soil Science

Prerequisite: EN 600, or a college-level course in physical geology or geography, or permission of instructor. Properties, occurrence, and management of soil as a natural resource. Covers the chemistry, physics, morphology, and mineralogy of soils and their genesis and classification. Soil properties are related to their role in environmental problem-solving and decision-making.

EN 632 Field Geology of the Northeast

Prerequisite: EN 600, or a college-level course in geology, or permission of instructor. Intensive training in geological field observation and interpretation in a variety of geologic settings. Weekly class meetings cover field techniques and localities. Five required field trips (three 1-day, one 3-day, one 4-day) focus on site geology, geomorphology, and environmental problems as well as field observation and interpretation. Field trips involve shared transportation and costs. 4 credits.

EN 633 Selected Topics in Field Geology

Prerequisites: EN 600 or undergraduate course in geology; other prerequisites depend on specific course topic. Selected field studies and trips of special interest. Credit varies depending on length of trip or investigation. May be taken more than once. 1–4 credits.

EN 634 Environmental Education Instructor Clinic

Prerequisite: One of the following: a college course in geology, biology, ecology, or science education, or permission of instructor. A course (conducted in the field) about teaching environmental and natural history topics. Students receive intensive field training in natural history and environmental education instruction techniques. Lab fee.

EN 640 Introduction to Geographical Information Systems

Survey of GIS technology, research, and applications in natural resource management, environmental assessment, urban planning, business, marketing, real estate, law enforcement, public administration, and emergency preparedness. Includes critical evaluation, case studies, and computer demonstrations.

EN 641 Geographical Information System Techniques and Applications I

Prerequisites: Working knowledge of PC-based computing and consent of instructor/program coordinator. First of a two-course sequence on GIS technology and applications. Laboratory exercises using both raster- and vector-based GIS systems. Hardware and software components of GIS; data acquisition, input, and manipulation; cartographic output; report generation.

EN 642 Geographical Information System Techniques and Applications II

Prerequisite: EN 641 or consent of instructor. Second of a two-course sequence on GIS technology and applications. Laboratory exercises using both raster- and vector-based GIS systems. Advanced GIS techniques, spatial analysis, and modeling for a variety of applications (e.g., environmental science and business planning), and development of GIS systems.

EN 643 Advanced Applications of GIS

Prerequisite: EN 642 or consent of instructor. Study of advanced GIS techniques for spatial analysis and management in a variety of application areas (e.g., environmental science, municipal, and utilities management). Includes GIS development, GIS modeling, advanced spatial analysis (e.g., geostatistics) and VBA/ArcObjects GIS programming. Students collaborate on a real-world project to design and implement a complete GIS application, and conduct individual GIS projects of interest to them, applying techniques learned in class.

EN 650 Environmental Microbiology

Prerequisites: Undergraduate biology degree, or a course in biology and a course in organic chemistry. Interaction of microorganisms (principally bacteria and fungi) and their environments, stressing transformations that they may accomplish depending on physical and chemical circumstances. Practical application of microbes in sewage and other soil/wastewater clean-up, biodeterioration, pest control, and production of useful products. Laboratory microcosm projects required. 4 credits.

EN 651 Bioremediation Science

Prerequisite: EN 650 or permission of instructor. Study of the use of microorganisms to decontaminate/remediate soil, groundwater, and air emissions containing various organic compounds. Includes survey of applicable microbial activities and growth parameters, classes of organic compounds that can be degraded/modified, and application of latest bioremediation technologies for cleanup. Laboratory involves review of site/hydrogeological plans for efficacy of bioremediation, visitation of available bioremediation sites (biopiles, bioventing, biosparging, etc.), and group projects involving sites currently undergoing bioremediation. 4 credits.

EN 670 Selected Topics

A study of selected issues of particular interest to the students and instructor. May be taken more than once.

EN 690 Research Project

Prerequisite: Permission of the instructor. Independent study under the supervision of an advisor.

EN 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

EN 696 Independent Study II

Continuation of Independent Study I.

EN 698 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

EN 699 Thesis II
Continuation of Thesis I.

Engineering Science

ES 605 Introduction to Digital Electronics
Prerequisites: College physics, including electricity and magnetism. An introductory course in digital electronics intended for K–14 teachers based on the "Project Lead the Way" curriculum. Covers both theoretical and practical skills in the pedagogical and content domains needed to teach classes in this field. Laboratory assignments include computer simulation of circuits and the wiring of prototype circuits. Lectures touch on printed circuit board design and implementation of digital circuits. Attitudes, procedures, and skills related to safety are addressed. This course may not be taken by engineering students for graduate credit. Lecture: 3 credits, Lab: 1 credit.

ES 610 Engineering Graphics with Solid Modeling
Prerequisite: Modern algebra with trigonometry. An introduction to computer-aided design with solid modeling intended for K–14 teachers based on the "Project Lead the Way" curriculum. Covers both theoretical and practical skills in the pedagogical and content domains needed to teach classes in this field. Emphasis is on advanced 2-D construction, 3-D solid modeling, and design drawing generation. A PC-based CAD package is used for course work. Attitudes, procedures, and skills related to safety are addressed. This course may not be taken by engineering students for graduate credit. Lecture: 3 credits, Lab: 1 credit.

Executive MBA

EXID 903 The Communication Process
A survey of communication theory as applied to the organizational environment. Special attention is directed toward management communication styles, conflict, disagreement, change in organizations, formal versus informal power and communication, people in organizations, structure of organizations, motivation, barriers to effective communication, and communication competencies in organizations. 2 credits.

EXID 909 Business and Government Relations
An analysis of the impact of major regulatory agencies of the federal government upon business. Specific attention given to the legal and economic impacts of the agencies; their independence of action vis-a-vis Congress, the judiciary, and each other.

EXID 912 Financial Accounting
An understanding of information in financial reports and how managers use this information in decision-making. Includes financial accounting standards, methods of financial statement analysis, and current developments in financial reporting.

EXID 915 Quantitative Decision-Making
Probability and financial analysis techniques within the framework of the randomness encountered in the real world. Includes practical applications of expected values, value of information, Markov systems, game theory, and decision theory.

EXID 918 Managerial Economics
Application of economic analysis to business forecasting, planning, and policy formulation. Includes cost-benefit analysis, cost estimation, and break-even analysis.

EXID 921 Executive Management and Leadership
The role of managers in globally competitive organizations. Topics include the nature of management and leadership, managing ethically in a global economy, basic management skill sets, and motivational theories.

EXID 924 Financial Management I
Analysis of financial decision models for investment, financing, and dividend decisions of the profit-oriented firm. Includes capital budgeting, capital structures, and the cost of capital and dividend policy.

EXID 927 Financial Management II
Analysis of financial decision models for the management of working capital. The management of current assets and the related financing mixture.

EXID 930 Marketing Practice
The new marketing concept and its application in the modern corporation. Organizational aspects and environmental determinants of marketing decisions are examined, culminating in a discussion of buyer behavior characteristics. Practical considerations in using the elements of the marketing mix: product, price, channel, and promotion policy.

EXID 933 Managing the Global Marketplace
An examination of the theory and practice of a national or international company trading in world markets. Focus on strategic planning for this environment from economic, political, social, regulatory, and competitive points of view.

EXID 939 Operations Management

An examination of the best practices used by operations management to achieve competitive advantage. Topics include organization, productivity measurement, competitiveness, product and process design, quality management, procurement, JIT, empowerment, and change management.

EXID 942 Managerial Accounting

An understanding of the uses of accounting data by managers in directing the affairs of organizations. Includes cost systems, profit planning, standard and relevant costs, and world-class manufacturing concepts.

EXID 948 Business Law

This course provides a framework for considering the respective roles of institutional and individual legal responsibility as they relate to major federal statutes commonly invoked in corporate prosecutions. Major emphasis is placed on employment law, including labor and white-collar prosecutions.

EXID 951 Marketing Management

Strategic considerations and options in managing a firm's marketing function. Scope and methods of marketing research as well as issues involved in new product management. The importance, opportunities, and constraints of international marketing; the unique aspects of service marketing.

EXID 954 Organizational Development

Effective management of the aggregate human resource in the modern organization. Analysis of human resource planning, recruitment, and selection; training and development; compensation and benefits; other human resource functions. Understanding how to utilize these functions in managing change for organizational effectiveness.

EXID 957 Corporate Policy and Strategy

Examination of the major management issues facing the chief executive with emphasis on resource allocation questions. Includes the strategy development process, supporting organization structure, and reward system. Serves as an integrating mechanism for several preceding courses.

EXID 960 Information Management

Analysis of technologies, costs, and challenges of integrating computers into the modern business environment.

EXID 997 The Washington Campus—How Washington Works/International Seminar

The seminars at the Washington Campus emphasize governmental process and the range of considerations and constraints that bear upon the decisions of policymakers. Corporate executives and future business leaders examine the working of the legislative, regulatory, judicial, and executive functions of government in order to understand more clearly how they, as managers, can build the critical public policy dimension into daily operations and corporate strategy. The faculty of the Washington Campus are drawn from government, business, the press, and academia. They include members of Congress and their staffs, senior administration officials, lobbyists, journalists, noted scholars, and corporate executives. As companies expand their markets abroad, they need employees who are globally aware, flexible to change, and able to understand various social and business cultures. Therefore, it is important that students be exposed to a variety of perspectives on the real-life issues of doing business in different countries.

EXID 998 Marketplace–Business Simulation

Prerequisites: EXID 912, EXID 924, EXID 930, EXID 942. In this business simulation, students virtually run a new venture firm for two years in compressed time (8 to 12 rounds of decision-making). The real challenge in the game, and in real-life ventures, is that managers must continually make a large number of concurrent strategic and tactical decisions, with no rest from the advertising decision or the market development decision, while solving the pricing decision. There is heavy emphasis on the interconnectedness of business functions.

EXID 999 Special Research Topics

A seminar that culminates in student research being presented and critiqued, and in which state-of-the-art topics may be examined by nonfaculty guest lecturers.

Engineering Management

EXIE 901 Engineering Management Concepts

Introduction to contemporary engineering management concepts as they appear in manufacturing and related service organizations. Review of the challenges faced by such organizations and of the various methodologies in use to meet these challenges. Managing the lean enterprise to deliver high-quality product in a timely fashion within demanding customer-supplier relationships.

EXIE 902 Managing Uncertainty

Probability models, stochastic processes, and descriptive statistical approaches applicable to managing engineering and technology projects. Topics include random variables, prob-

ability functions, expectations, discrete and continuous distribution, probability computation, summary measures, data presentation schemes and their applications in process control, forecasting, lead time estimation, queues, and customer demand functions. Excel and other software are used.

EXIE 903 Statistics for Quality and Engineering Management

Comprehensive survey of the many roles of statistics in TQM, quality assurance, simulation, experimentation, risk assessment, and performance evaluation. Deming, Juran, Taguchi, and ASQ contributions are presented as engineering management resources.

EXIE 914 Achieving Optimal Operations

Concepts of lean production, Japanese production systems, push vs. pull production systems, benchmarking and evaluation schemes, schedule management, overcoming bottlenecks, and performance and productivity improvement techniques applicable to service and manufacturing systems. Workforce issues including union acceptance, productivity, and workforce education, training, and compensation.

EXIE 926 Constraint Assessment

Achieving effectiveness, productivity, and profitability through management of constraints. Automation issues, offshore production, union reactions, and access to capital. Strategic planning for optimality.

EXIE 930 Project Management

Review of CPM-PERT methodologies and use in managing complex engineering-related projects. Analysis of bias in estimating and in forecast preparation. Strategies for achieving on-time task completion and minimizing critical chains.

EXIE 940 Supply Chain Management

The course presents the process of planning, implementing, and controlling flow and storage of goods, services, and related information from point to point of consumption with customer requirements in mind. Topics include fundamentals of logistics, logistics information systems, inventory concepts and management, material flow and transportation management, warehousing and material handling, and global logistics.

EXIE 948 Queuing Theory and Applications

Survey of queuing problems met in both manufacturing and service organizations, and a description of queuing theory applicable to such problems. Roles of analysis and simulation are discussed in the context of managing queues and solving queuing problems.

EXIE 950 Simulation of Processing Systems

Review of the role of simulation in analyzing complex manufacturing and nonmanufacturing systems, and an introduction to typical simulation software. Case studies of successful implementations are presented together with guidelines for using simulation to solve system problems.

EXIE 956 Managing Quality Assurance

Review of the complex and dominant role that quality plays in creating excellent customer-supplier relationships. Discussion of quality goals and management strategies to achieve them.

EXIE 957 Organizational Change and Development

This course addresses the nature of organizational development, intervention by third-party consultation, change in organizational structure and role relationships, evaluation of change efforts, participation, conformity, and deviation. The course focuses on real organizations, not hypothetical constructs; on actual human performance challenges, not theoretical issues; and on typical operational problems, not experimental design concerns. Emphasis is on practical application.

EXIE 960 E-Solutions in Engineering Management

The course presents current and emerging Internet technology as it relates to engineering management; in particular, e-supply, e-logistics, e-commerce, and the rapid increase in the types and uses of electronic media in the daily functions of engineering managers. Topics also include basics of the Internet and multimedia technologies, products and vendors, and critical management and policy issues such as access, risk assessment, reliability, security, and privacy.

EXIE 970 Current Topics in Engineering Management

Current topics relevant to engineering management but focusing on specific themes such as environmental laws on regulation, security and protection technologies, new engineering approaches to product and process management, and new process and quality improvement practices.

EXIE 999 Research Topic

Independent study and research focused on a problem of interest, either in a work environment or in a community/nonprofit organization. Guided by a faculty advisor, a project report is written that describes the problem, outlines the scope of work, and presents recommendations and solutions in a professional manner. An oral presentation is made to colleagues in this capstone experience ending the program of study.

Finance

FI 601 Financial Management

Prerequisites: A 620, EC 601, and QA 604. An examination of the valuation, investment, and financing of the firm and its business activities. Includes valuation of investment under uncertainty and implications for investment strategy; the cost of capital and capital structure and implications for financing strategy; leasing; dividend policy; fundamental risk management concepts and implications; and (if time permits) mergers, acquisitions, divestiture, the market for corporate control, and the hedging of corporate risk exposure.

FI 602 Corporate Valuation and Business Strategy

Prerequisites: A 620, EC 601 or EC 604, FI 601, and QA 604. Examination of valuation, investment, and financing of the firm and their implications for strategic decision-making. Topics include objective of the firm and agency theory; strategies for the investment decision; short-term financial management strategies; theories of choice and decision-making; state preference theory and its implications for planning and strategy; risk measurement and decision-making; derivatives and their applications to corporate risk management and planning; efficient capital markets and value creation; capital structure; valuation models and dividend policy; merger and acquisition strategies; the leasing decision and business planning; and international financial management strategies.

FI 605 Data Evaluation and Modeling

Prerequisite: FI 601. Introduction to the quantitative models used in finance. Application of statistical and deterministic models to financial decision-making. Use of electronic spreadsheets and statistical software.

FI 610 Capital Market Theory

Prerequisite: FI 601. A review of modern portfolio theory. Includes theory of choice under certainty and uncertainty; portfolio analysis; capital asset pricing model; arbitrage pricing model; global investing and portfolio formation; and portfolio performance measurement, evaluation, and selection.

FI 611 Equity Market Valuation and Analysis

Prerequisite: FI 601. Integrated review of investment opportunities in the securities markets. Includes capital market efficiency and arbitrage; valuation models and individual security analysis and valuation; aggregate market analysis; capital market theory; global investing and portfolio performance; alternative investments—analysis and valuation; and introduction to regulation and professional standards of ethics.

FI 612 Applied Portfolio Management

Prerequisite: FI 601. Course describes and demonstrates the dynamic decision-making process of portfolio management. The portfolio construction process, including the formulation of objectives, constraints, and preferences; the ongoing monitoring process; and conducting a performance evaluation. Special attention to recent developments in dynamic portfolio applications.

FI 613 Derivative Market Analysis and Trading Techniques

Prerequisite: FI 601. An examination of financial futures and options markets; futures and options pricing and hedging; trading techniques.

FI 620 Capital Markets and the Valuation of Fixed Income Securities

Prerequisite: FI 601. The function and structural trends of financial markets. Analysis of the flow of funds; foundation of interest rates; term structure of interest rates; determinants of interest rates; global financial markets.

FI 625 Advanced Capital Market Issues

Prerequisites: FI 605, FI 620. An examination of current practices and new developments in capital markets. Various topics highlight recent developments. The primary areas of study are financial and capital market innovations, monetary policy, domestic and international money markets, and techniques for analyzing financial markets. Students are required to complete a major, independent research project.

FI 630 Corporate Financial Analysis and Applications

Prerequisite: FI 601. The examination of short-term financial management, mergers and acquisitions, corporate restructuring, financial distress, corporate risk management, leasing, and hybrid corporate securities.

FI 631 Management of Financial Services

Prerequisite: FI 601. An examination of operational techniques and strategies relevant to financial management in the financial services industry.

FI 632 International Financial Management

Prerequisite: FI 601. Focus on international capital markets, determinants of foreign exchange rates, and hedging techniques. Major emphasis on managing and measuring accounting, economic, and operations exposure; managing political risk; international capital budgeting and short-term financial management; international financing of investment.

FI 635 Advanced Corporate Financial Management Issues

Prerequisites: FI 602, FI 605. An examination of developments and techniques in financial management, highlighting recent developments.

The primary areas of study are value creation, human capital, globalization, risk management, and strategic management. Students are required to complete a major research project.

FI 670 Selected Topics
A study of selected issues of particular interest to students and instructor. May be taken more than once.

FI 690 Research Project
Prerequisite: 15 graduate credits or permission of the instructor. Independent study under the supervision of an advisor.

FI 693 Internship
Prerequisites: six credits of advanced finance course work and approval of program coordinator/advisor. A program of field experience in a corporate or financial services organization.

FI 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

FI 696 Independent Study II
Continuation of Independent Study I.

FI 698 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

FI 699 Thesis II
Continuation of Thesis I.

Forensic Science

FOR 614 Survey of Forensic Science
An introductory survey of forensic sciences and criminalistics, crime scene procedures and documentation, and methods of laboratory analysis for all forensic science students.

FOR 616 Advanced Crime Scene Investigation
An in-depth study of crime scene procedures including recognition, protection, documentation, and collection of physical evidence; scene documentation, scene search procedures; and reconstructions from evidence and scene patterns.

FOR 617 Forensic Expert Testimony
Prerequisite or corequisite: FOR 614. This course will provide information related to the various aspects of expert witness testimony, for "marketing" skills and good communication techniques to managing difficult questions and ethical issues. The expectations of the legal and scientific communities will be explored using case examples and exercises that point to the conflicts that sometimes may arise from these different perspectives. Students will participate in a moot court testimony session in which they will demonstrate their expert witness knowledge and ability to effectively communicate in a court setting.

FOR 618 Forensic Photography
Prerequisite or corequisite: FOR 614. This course will explore the use of imaging techniques as they relate to crime scene and evidence documentation. The first portion of the course focuses on film/digital image capture and the second on digital image processing using Adobe Photoshop and other software. The course includes extensive hands-on experience both in photography as well as image processing labs. Topics include but are not limited to: theory, techniques, crime scenes, evidence, macro, alternative light energy, photogrammetry, image clarification and legal considerations. Laboratory fee required.

FOR 619 Fingerprint Analysis
Prerequisite: FOR 614. This is an advanced course in the science of fingerprints. The history of fingerprints, development and recognition of fingerprints, collection and documentation of fingerprint evidence, various processing techniques, fingerprint comparison and identification, taking inked fingerprint impressions and the latest advances in fingerprint identification will be discussed during the course. Laboratory fee required.

FOR 620 Advanced Criminalistics I
Corequisite: FOR 621. The comparison and individualization of physical evidence are presented in lectures and carried out in the laboratory. The theories and practice of microscopic, biological, immunological, and chemical analysis are applied to the examination of blood, semen, and other body fluids.

FOR 621 Advanced Criminalistics I Laboratory
Corequisite: FOR 620 Advanced Criminalistics I is required. Laboratory fee required; 1 credit.

FOR 622 Forensic Engineering I
Introduction to the field of forensic engineering, and the first of two-course sequence. Basic engineering relevant to failure analysis and root cause assessment, including the failure of complex systems is discussed. Other topics covered include: concepts of stress, strain, and fatigue, buildings and structures and their performance when faced with natural and manmade extreme forces. Automotive engineering, crashes and component and systems failures, aircraft failure and fire and explosion analyses are also covered.

FOR 623 Forensic Engineering II
A second course in an introduction to forensic engineering, designed to survey failure modes in different engineer-

ing disciplines and in different products, including automobiles, aircraft, home construction, buildings and structures, marine applications, household products. Techniques are described for gathering engineering evidence, assessing a likely cause, and designing a test replication. Report generation is also included. Designed primarily for the non-engineer, the course prepares the investigator for the task of seeking qualifies engineering expertise and procuring laboratory support. No prerequisite is required: the course is free-standing.

FOR 625 Chemistry of Fires and Explosions
An examination of the basic organic chemistry and combustion and explosive properties of flammable materials. The chemical principles underlying fires and explosions. Chemical properties of various synthetic materials and the products of their combustion. Fire retardant materials and chemicals used in fire extinguishment. (See also CH 625.)

FOR 632 Advanced Investigation I
An in-depth study of modern principles and techniques of criminal and civil investigations. Management of investigations, use of witnesses, interviewing, polygraph, backgrounds, establishment of MO, missing persons, surveillance, and investigation of questioned deaths and death scenes.

FOR 633 Advanced Investigation II
An in-depth study of the principles and techniques of criminal and civil investigations. Investigation of fraud, embezzlement, white-collar crime, property crimes, sexual assaults and other crimes against persons; extortion; kidnapping; drug trades; and traffic accidents.

FOR 640 Advanced Criminalistics II
Introduction of advanced microscopic, chemical, and instrumental methods with extensive hands-on experience provided by a laboratory section. Principles and methods of analysis of microscopic and macroscopic evidence such as glass, soil, papers, inks, dyes, paints, varnishes, explosives, fibers, drugs, and other potential physical traces are discussed.

FOR 641 Advanced Criminalistics II Laboratory
Laboratory fee required; 1 credit.

FOR 645 Drug Chemistry and Identification
Introduction to licit and illicit drugs as evidence, followed by an overview of chemical, microscopical, and instrumental techniques used for their identification; discussion of sampling, separation, and quantitation of evidence specimens; presentation of drug-chemistry expert testimony in courts of law.

FOR 653 Physical Analysis in Forensic Science
The classic firearms examination, classification, and comparison of bullets and cartridges; toolmarks comparison and striation analysis; serial number restoration; document examination; voiceprint identification, fingerprints, and polygraphy examination.

FOR 654 Physical Analysis in Forensic Science Laboratory
Laboratory fee required; 1 credit.

FOR 660 Forensic Microscopy
The theory and techniques of optical microscopy for evidence detection, analysis, and evaluation. Microscopical methods of analysis and polarized light microscopy are covered in lecture and laboratory. Laboratory fee required.

FOR 661 Medicolegal Investigation and Identification
An introduction to procedures and techniques for medicolegal investigation of questioned death and identification of deceased persons, including autopsy techniques, odontological procedures, and anthropological approaches.

FOR 662 Forensic Toxicology
Forensic Toxicology is presented as a mechanistic/biochemical exploration of the issues and drugs and questions routinely confronting the practicing forensic toxicologist. Following an initial exploration of the historical roots of the discipline, the course moves through an organ-system review of physiologic function, and the mechanisms by which specific and typical toxic classes and species interfere with those functions. Neurologic functions and toxicity are a special interest and focus of this section. The final sections of the course deal with some of the major drug classes, including opiates, other drugs of abuse, natural and herbal drugs, and plants and animal poison, toxins and venoms.

FOR 670 Selected Topics

FOR 673 Biomedical Methods in Forensic Science
Prerequisite: FOR 620. Corequisite: FOR 674. Methods of modern biochemistry, genetics, and molecular biology as applied to the examination and individualization of biological evidence in forensic science. Includes discussion of prior methods up to the most current in forensic biology.

FOR 674 Biomedical Methods in Forensic Science Laboratory
Corequisite: FOR 673. Laboratory fee required; 1 credit.

FOR 686 Forensic Science Research Project I
Individual guidance on a research endeavor. 1–3 credit.

FOR 687 Forensic Science Research Project II
Prerequisite: FOR 686. Continuation of Research Project I. 1–3 credit.

FOR 688 Forensic Science Internship I
Formal educational development is complemented by field placement experience in a forensic science laboratory or identification unit. Field experience is supervised by designated agency and department personnel. Students must complete a project in connection with the internship placement and experience; an appropriate work product must be provided to the instructor.

FOR 689 Forensic Science Internship II
Prerequisite: FOR 688. Continuation of Internship I

FOR 695 Independent Study

FOR 697 Thesis I

FOR 698 Thesis II
Continuation of Thesis I.

FOR 699 Thesis III
Continuation of Thesis II.

Fire Science

FS 625 Chemistry of Fires and Explosions
An examination of the basic organic chemistry, combustion, and explosive properties of flammable materials. The chemical principles underlying fires and explosions; chemical properties of various synthetic materials and the products of their combustion. Fire retardant materials and chemicals used in fire extinguishment. (See also CH 625.)

FS 631 Organization and Management of Public Fire Protection
A presentation of modern management principles and techniques of the organization, and delivery of the array of services that communities have come to expect from the fire service. The traditional and evolving roles of fire service protection, prevention, risk analysis, and community service are also considered.

FS 632 Strategic Planning for the Fire Service
The application of systematic long-range or "master" planning in determining the types and levels of community fire service. As part of this course each student will develop a strategic plan for a public safety organization using one of the commonly accepted approaches to strategic planning in the public domain.

FS 633 Issues in Public Safety Professional Responsibility
This course addresses the unique ethical problems and environments in which public safety services are delivered. Specific issues covered include public safety discretion, codes of conduct and discipline, and the ethical exercise of the "public trust." Investigation of the ways in which organizations can anticipate and plan for ethical problems.

FS 634 Issues in Public Safety Management
Provides public safety professionals with a broad view of current topics in the field. Utilizing lectures, discussions, and case studies, the course considers the results of applying modern public management practices and principles in a public safety context.

FS 649 Fire Scene Investigation and Arson Analysis
The techniques of crime scene documentation and investigation as they relate to fire and explosion scenes. Evidence recognition and collection. Laboratory analysis of fire scene, arson accelerant, and explosion scene residues; scientific proof of arson. Laboratory fee required; 4 credits. (See also CJ 649.)

FS 650 Arson for Profit
This course provides an overview of the financial techniques needed to investigate arson-for-profit fires, with an emphasis on sources of information, identification, and analysis of financial documents.

FS 661 Systems Approach to Fire Safety
The systems approach to fire safety as used by fire protection engineers, fire science technicians, and fire administrators in analyzing and designing fire safety in buildings. Considers the various routes that can be followed to achieve low-budget, logical, cost-effective ways of accomplishing fire safety goals.

FS 663 Fire Protection Systems Application
A study of the application of various fire protection systems and programs to fire/life safety problems. An in-depth review of certain fire protection codes and standards and the proper interpretation of each. Use of codes and standards to determine specific protection requirements.

FS 664 Terrorism
A detailed discussion and review of the consequences of terrorism and the offensive measures taken by emergency response organizations to prevent, deter, and respond to terrorism incidents.

FS 665 Legal Aspects of Fire and Arson Investigation
The legal principles underlying and governing the conduct of criminal investigations, with particular emphasis on arson. The criminal law relating to arson, establishment of the crime, investigation, and prosecution procedures in arson cases.

FS 666 Industrial Fire Protection

Prepares fire professionals to make decisions on various fire protection schemes in industry and other commercial property situations. Since fire protection responsibilities are often delegated to the occupational safety or security manager, the course provides background in fire protection for these individuals.

FS 667 Fire and Building Codes, Standards, and Practices

The study of building and fire codes and regulations as they relate to prevention and incidence of structural fires. Contemporary building and fire codes and practices and their enforcement. Model building codes; fire prevention and control through building design. (See also CJ 667.)

FS 668 Fire and Casualty Insurance Practices

A study of financial risk and decision-making. Insurance rate-making and relation to risk and other factors. Insurance adjustment and economic factors that must be considered in fire and accident investigations. (See also CJ 668.)

FS 669 Dynamics, Evaluation, and Prevention of Structural Fires

A detailed analysis of the factors and physical processes that govern the growth and spread of fire and its products within a structure. Includes a review and an evaluation of national, state, and local fire loss data leading to the development of fire prevention strategies. (See also CJ 669.)

FS 670 Selected Topics

An examination and evaluation of problems faced by today's fire, public safety, insurance, and security professionals.

FS 681 Seminar/Research Project in Public Safety Management I

Prerequisite: 18 undergraduate/graduate credits in a public safety discipline or permission of the program coordinator. Problems in public safety management and current techniques to deal with them. Requires a supervised research project directly related to the topic and weekly meetings with faculty throughout the term. Format of course may vary; a three-day specially scheduled seminar may be included.

FS 682 Seminar/Research Project in Public Safety Management II

Continuation of Seminar/Research Project in Public Safety Management I.

FS 683 Seminar/Research Project on Comparative Public Safety Systems

Prerequisite: 18 undergraduate/graduate credits in a public safety discipline or permission of the program coordinator. Examination, assessment, and comparison of various approaches used in protecting public health and safety. Current management approaches to public safety problems. Requires a supervised research project directly related to the topic and weekly meetings with faculty throughout the term. Format of course may vary; a three-day specially scheduled seminar may be included.

FS 684 Fire Scene Reconstruction

Application of principles of reconstruction of a fire scene, including fire behavior, fire pattern analysis, ignition mechanisms, interpretation of human behavior, and fire scene analysis. Emphasis on scene documentation, origin and causes determination, preparation of reports, arson motives, and rendering of advisory opinions to assist in the resolution of disputes affecting life and property. (See also CJ 684.)

FS 690 Research Project

Prerequisite: 30 graduate credits. A major research project under the supervision of the director of the fire science program.

FS 693 Internship

The student's formal educational development is completed by field experience in various fire science settings or agencies. Under faculty supervision, the student engages in field experience and produces a comprehensive project report analyzing the internship experience.

FS 695 Independent Study

A directed, and independent learning experience with the topic and format to be agreed upon by the student and supervising faculty.

FS 698 Thesis I

Prerequisite: 15 graduate credits. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

FS 699 Thesis II

Continuation of Thesis I.

History

HS 607 World History in the Twentieth Century

A survey of major global events and trends since 1900. Advanced industrial societies emphasized, but major regions of the Third World also studied. Includes the World Wars, patterns of economic cooperation and competition, decolonization, and East-West conflicts.

HS 610 Survey of United States History

Broad-based review of American history from colonial period to the present. This course is designed specifically for preservice teachers to meet Connecticut state certification requirements.

HS 650 Latin American History
Analyzes the history of colonial Latin America from Ancient America and pre-contact fifteenth-century Europe to the nineteenth century independence revolutions and the modern struggles with political instability and economic dependence. The focus is on how the admixture of European and New World inputs gave rise to unique Latin American cultures.

HS 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

HS 695 Independent Study
A planned program of individual study or research under the supervision of a member of the faculty.

Humanities

HU 651–658 Topics in Humanities
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

HU 659 Writing and Speaking for Professionals
A practical, tool-oriented approach for professionals who need to perfect writing and speaking skills for career advancement or presentations in graduate courses. Students generate work-related writing/speaking assignments and negotiate learning contracts based on editing, writing, and speaking methods related to individual needs and objectives. (See also E 659.)

HU 695 Independent Study
A planned program of individual study or research under the supervision of a member of the faculty.

International Business

IB 643 International Business
Prerequisites: EC 601, MK 609. An introduction to the political, economic, technological, and cultural settings of international business. Examines the problems, policies, and operational procedures of the multinational corporation, including the adjustment to foreign cultures and governments. Review of development, organization, and structure of the international firm.

IB 644 Managing in Global Markets
Prerequisites: EC 601, FI 601, MG 637, and MK 609. This course provides the student with an understanding of the effects of globalization on the economic environment and corporate operations. It examines multinational operations and the many adaptations management must undertake to successfully interact with various global business environments. Topics are examined from both domestic and international perspectives and include the operational and strategic adjustments necessary for the multinational to navigate among the diverse and rapidly evolving cultural, political, economic, financial, operational, and ethical environments of global markets.

IB 645 Comparative International Business Environments
Prerequisites: IB 643, MK 609. A comparative approach to the study of the noneconomic aspects of foreign markets of several representative areas in the world. Focus on the interaction between the sociocultural environment of host nations and the multinational firm.

IB 650 International Business Negotiating
Prerequisite: IB 643. A description and analysis of the various stages involved in the international business negotiating process. Also, a survey of the different types of values and behaviors encountered in business negotiating. Case studies of representative countries are included.

IB 652 Multinational Business Management
Prerequisites: IB 643, MK 609. An examination of global strategy, ownership control, organization, and resource management. Major attention given to international risk analysis.

IB 660 East and Southeast Asian Business Systems
Prerequisites: IB 643, MG 637. An analysis of the business systems of selected nations in East and Southeast Asia. Emphasis on the historical, political, and cultural underpinnings of business activity. Negotiating strategies and techniques to be used with selected East and Southeast Asian governments and firms.

IB 670 Selected Topics
A study of selected issues of particular interest to students and instructor. May be taken more than once.

IB 690 Research Project
Prerequisites: 15 graduate credits and permission of the instructor. Independent study under the supervision of an advisor.

IB 693 Internship
Prerequisites: 6 credits of IB concentration courses and approval of internship coordinator. A program of field experience in selected organizations in international trade and marketing.

IB 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

IB 696 Independent Study II
Continuation of Independent Study I.

IB 698 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

IB 699 Thesis II
Continuation of Thesis I.

Industrial Engineering

IE 601 Introduction to Operations Research/ Management Science
Prerequisite: IE 607. Introduction to the techniques and philosophies of management science and operations research. Includes linear programming, inventory analysis, queuing theory, dynamic programming, decision analysis, and other modeling techniques.

IE 604 Management Systems
Techniques of industrial and governmental systems management, including general systems and organizational theory.

IE 607 Probability Theory
Prerequisite: Basic knowledge of differential calculus. Probability of events, definition of random variables, and introduction to basic probability distributions. Use of probability in stochastic processes pertaining to queues, forecasting, birth-death processes, and human behavior.

IE 609 Descriptive and Inferential Statistics
Prerequisite: IE 607 or equivalent. Inferential statistical designs including basic statistical tests and analysis of variance. Statistical theories and application of correlation analysis, multiple linear regression, nonlinear regression, and analysis of co-variance.

IE 611 Decisions in Operations Management
Prerequisites: MG 637, QA 604, or equivalents. Study of organizations as systems producing goods and services. Review of concepts, functions, and basic techniques as applied to operations management. Examination of new trends and developments such as just-in-time, synchronous manufacturing, quality management, cycle-time reduction, and concurrent engineering. Emphasis on interrelations of different operational decisions on the final product, and competitive position of the organization.

IE 612 Managerial Interactions I
An interdisciplinary systems approach to human behavior in organizations, with emphasis on the impact of industrial engineering methods on organizational performance. Deals with individual motivation and face-to-face interaction in managerial roles.

IE 613 Managerial Interactions II
Prerequisite: IE 612. Continuation of IE 612. Organizational development, job enrichment, and modern work attitudes.

IE 614 Data Information Systems
Prerequisites: Any of the CS 604 through CS 610 courses or equivalent, and IE 604. Introduction to automated information systems planning and operations, and their impact on management decision-making, control functions, and communication capabilities. An overview of concepts and procedures with applications in urban environments, large organizations, and governmental agencies. Techniques presented include PERT/CPM, Gantt charting, and cost-benefit analysis.

IE 615 Transportation and Distribution
Prerequisite: IE 601 or equivalent. Introduction to transportation science with emphasis on physical distribution problems. Survey of operations research models and optimization strategies, and their roles in transportation systems management.

IE 621 Linear Programming
Prerequisite: IE 601 or equivalent. Thorough coverage of the techniques and applications of linear programming. Special simplex forms and optimality conditions, duality, and sensitivity. Applications to network flow problems.

IE 622 Queuing Theory
Prerequisite: IE 601 or equivalent. Elements of queuing theory including finite and infinite cases. Single-server and multiple-server parallel channels/series queues and special cases are analyzed.

IE 623 Decision Analysis
Prerequisite: IE 609 or equivalent. Decision theory, game theory; benefit-cost analyses under uncertainty; advanced engineering economic analysis.

IE 624 Quality Analysis
Prerequisite: IE 609 or equivalent. Concepts of quality and statistical quality analysis. Sampling techniques and decision processes.

IE 625 Advanced Mathematical Programming
Prerequisite: CS 606 or equivalent, IE 621. Advanced mathematical programming techniques. Integer programming, goal programming, and multiple objective linear programming techniques. Computer applications are demonstrated.

IE 643 Reliability and Maintainability
Prerequisite: IE 609 or equivalent. The basic theory and methodology of reliability and maintainability, including application of discrete and continuous distributions and statistical designs. Reliability, estimation, structure models, and growth models.

IE 651 Human Engineering I
An introduction to the design of machines, jobs, and environments with consideration of ergonomic principles. Coverage of behavioral, anatomical, physiological, and organizational factors affecting performance, comfort, and safety.

IE 652 Human Engineering II
Prerequisite: IE 651 or equivalent. Continuation of IE 651. In-depth analysis of selected topics in ergonomics, including work physiology, anthropometry, and signal detection theory. Laboratory experiments and reports included.

IE 655 Manufacturing Analysis
Prerequisites: Undergraduate courses in manufacturing or manufacturing work experience and consent of instructor. The theory of metal cutting and metal working for improving the manufacturing operations involving metal machining and metal working. An opportunity for students to thoroughly understand the experimental approaches used in manufacturing.

IE 661 Facility Infrastructure
An overview of facilities planning and design considerations, with an emphasis on service and non-manufacturing facilities. Includes facilities planning approaches and procedures, ergonomic considerations, access and accommodation issues, flow of people and materials, facility services, and facility flexibility and adaptability.

IE 671 Current Topics in Operations Research
Prerequisite: IE 601 or permission of instructor. An examination of new developments or current practices in operations research. A topic will be selected for thorough study. Possible subject areas include nonlinear programming, network theory, scheduling techniques, specialized techniques, and specialized applications. Content may vary from trimester to trimester.

IE 672 Current Topics in Industrial Engineering
Prerequisite: IE 601 or permission of the instructor. An examination of new developments or current practices in industrial engineering. A topic will be selected for thorough study. Possible subject areas include reliability, production engineering, human factors, and specialized applications. Content may vary from trimester to trimester.

IE 681 System Simulation
Prerequisite: IE 601. Modeling and analysis of systems using discrete-event simulation technique with particular emphasis on applications in production and operations management, manufacturing, and services. Lean implementaion via simulation analysis. The role and significance of data, data collection, random number generators, and uncertainty in input variables are examined. Use of simulation software and several projects are required.

IE 682 Advanced System Simulation
Prerequisite: IE 681 or equivalent. Emphasis on model building and on design and analysis of simulation experiments for service and manufacturing systems. Student projects in real environments are required.

IE 683 Systems Analysis
Prerequisites: IE 601, IE 609 or equivalent, IE 614. Techniques and philosophies defining the concept of systems analysis are presented in detail, and are illustrated with large-scale case studies. Diverse systems covering the social, urban, industrial, and military spheres are analyzed. Techniques include utility theory, decision analysis, and technological forecasting.

IE 685 Theory of Optimization
Prerequisite: IE 601. Methods of nonlinear optimization and programming. Search methods including golden section and dichotomous; constrained and unconstrained optimization including Rosenbrocks and Fletcher-Powell algorithms. Penalty and barrier function methods.

IE 686 Production and Inventory Analysis
Prerequisites: IE 601; IE 607 or equivalent. Inventory theory and models and their applications to production and operations. Methods of production including Kanban systems, JIT, MRP and their relationships to fundamental inventory techniques with computer applications.

IE 687 Stochastic Processes
Prerequisite: IE 601 or equivalent. The theory and application of discrete and continuous-time stochastic processes. Areas of application include queuing, inventory, maintenance, and probabilistic dynamic programming models.

IE 688 Design of Experiments
Prerequisite: IE 609 or equivalent. Principles of modern statistical experimentation and practice in use of basic designs for scientific and industrial experiments; single factor experiments, randomized blocks, Latin squares; factorial and fractional factorial experiments, surface fitting designs.

IE 690 Research Project
Prerequisites: 15 graduate credits and permission of the program coordinator. Independent study under the guidance of an advisor in an area of mutual interest, such study terminating in a technical report of academic merit. Research may constitute a survey of a technical area in industrial engineering or operations research or may involve the solution of an actual or hypothetical technical problem.

IE 695 Independent Study I
Prerequisite: Permission of the program coordinator. Independent study under the guidance of an advisor in an area designated by the program coordinator.

IE 696 Independent Study II
Continuation of Independent Study I.

IE 698 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

IE 699 Thesis II
Continuation of Thesis I.

Law

LA 674 Business Law and the Regulatory Environment
An overview of the legal system as it relates to the operation of a business. Topics include those relating to the establishment and continuity of business relationships, including contracts, product liability, warranty, agency business entities, property, business crimes and torts, intellectual property, credit and bankruptcy; and those regulating business activities, including employment, environment, securities, and antitrust laws.

Logistics

LG 660 Logistics Technology and Management
Survey of modern logistics activities in both the commercial and military sectors. Theory of integrated logistics systems with applications to include customer-supplier relationships, inventory management, just-in-time and related procurement disciplines, spares and customer field support, transportation, warehousing, and physical distribution management. Quantitative and e-commerce tools are described in the context of corporate enterprise resource planning and logistics management.

LG 663 Logistics in Acquisition and Manufacturing
Managing logistics processes in purchasing, acquisition, and manufacturing. Optimizing logistics in complex, worldwide supply chains; in distribution systems designed for multiproduct, multiplant organizations; and in single-plant systems producing for the end customer. Designing customer support strategies and multimodal transportation interfaces.

LG 664 Patents and Licensing in the Acquisition Process
Supply-chain management, purchasing, and product or service acquisition require a knowledge of patent law, licensing, and related international agreements. Current practice in patent law is described, together with ramifications for various industries including telecommunications and contract manufacturing.

LG 665 Integrated Logistics Support Analysis
Concepts of integrated logistics support in both the commercial and military sectors including logistics specialities, customer support, documentation needs, Internet applications, and system management on a worldwide basis. Introduction to reliability, maintainability, life cycle cost analysis, test and support capability, and warranty management.

LG 669 Life Cycle Cost Analysis
Theory and application of life cycle cost analysis applicable to both military and commercial decision support processes. Techniques for forecasting costs in future scenarios including economies of scale, upgrading, recycling, customer relationship support, training, and salvage and exit strategies. Application to new product development. Effectiveness over expected lifetime versus total life cycle cost.

LG 670 Selected Topics
A study of contemporary issues in logistics keyed to student and instructor interests. May be taken more than once.

LG 690 Research Project
Prerequisite: 15 graduate credits or permission of the instructor. Independent study under the supervision of an advisor.

LG 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

LG 696 Independent Study II
Continuation of Independent Study I.

LG 698 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

LG 699 Thesis II
Continuation of Thesis I.

Mathematics

M 601 Mathematical Ideas
This course is intended for students in the M.S. Education program. It surveys the development of mathematics through such key topics as geometry, trigonometry, abstract algebra, and calculus. While topics may vary with individual instructors, all instructors introduce students to the contributions of mathematics to civilization and give students some understanding of the discipline of mathematics.

M 604 Using Technology to Teach Mathematics
Prerequisites: Elementary calculus, familiarity with word processing and spreadsheet programs, or permission of the Department. Students are introduced to a variety of technological tools (calculators, computer soft-

ware, Internet resources) useful in improving mathematics instruction. Students investigate how technology can effectively be utilized in learning situations. Lesson plans that incorporate technology are developed.

M 605 Biostatistics

A non-calculus-based course that includes basic concepts of probability and statistics. These concepts are applied to problems in human biology, industrial/occupational health, and epidemiology. Introduction to and use of the computer package SPSS for data analysis. (See also BI 605.)

M 610 Fundamentals of Calculus

Prerequisite: M 115 (pre-calculus mathematics) or equivalent. Review of algebra and trigonometric functions. Topics from calculus include differentiation and integration methods applied to problems in science, business, and the social sciences. A review of series.

M 611 Matrix Theory and Its Applications

Prerequisite: Undergraduate linear algebra or permission of instructor. Review of matrix algebra, systems of linear equations and rank; linear algebra in n-dimensions; inner product spaces and orthogonality; eigenvalues and eigenvectors; Hermitian, unitary, and normal matrices; quadratic and Hermitian forms. The course covers topics in matrix theory needed for significant applications in engineering and computer science.

M 615 Linear Mathematics and Combinatorics

Prerequisite: M 610 or equivalent. Discrete mathematics topics used extensively in computer science, including linear algebra, graph theory, and combinatorics. Emphasis on applications to computer science.

M 616 Applied Modern Algebra for Computer Science

Prerequisite: M 615. Advanced topics in logic and combinatorics as well as an introduction to discrete modern algebra and its applications to computer science.

M 620 Numerical Analysis

Prerequisites: A minimum of 12 credits of undergraduate mathematics, including calculus and linear algebra; knowledge of a computer programming language such as Pascal, C programming, FORTRAN, or BASIC. Topics include solution of transcendental equations by iterative methods; solution of systems of linear equations (matrix inversion, etc.); interpolation, numerical differentiation, and integration; solution of ordinary differential equations.

M 624 Applied Mathematics

Prerequisite: A minimum of 12 credits of undergraduate mathematics, including calculus and differential equations. Special functions; Fourier series and integrals; integral transforms (Fourier, Laplace, etc.), and their use in solution of boundary value problems.

M 632 Methods of Complex Analysis

Prerequisite: Graduate standing in engineering or mathematics. A study of applications of the methods of complex variables to engineering and physical sciences. Includes analytic function theory, contour integration, and conformal mapping.

M 670 Selected Topics

Prerequisite: Permission of the instructor. A study of selected topics of particular interest to the students and instructor. May be taken more than once.

M 690 Research Project

Prerequisite: 15 graduate credits or permission of the instructor. Independent study under the supervision of an advisor.

M 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

M 696 Independent Study II

Continuation of Independent Study I.

M 698 Thesis I

Prerequisite: 15 graduate credits. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

M 699 Thesis II

Continuation of Thesis I.

Molecular Biology

MB 601 Protein Biochemistry and Enzymology

Prerequisites: Undergraduate organic chemistry and biochemistry. This course examines the relationship between protein structure and function. Topics included are properties of amino acids, peptides and proteins, peptide synthesis, protein isolation and sequencing, aspects of protein folding, protein-protein and receptor ligand interactions, enzyme kinetics, and enzyme regulation.

MB 602 Biochemistry of Bioenergetics

Prerequisite: Undergraduate organic chemistry. This course is strongly recommended for students lacking undergraduate biochemistry. Examination of the major anabolic and catabolic pathways and their regulation. Catabolic pathways for the oxidation of hexoses, lipids, and amino acids are considered. These processes lead to the formation of a chemiosmotic gradient capable of driving ATP synthesis. Discussion of the anabolic pathways starts with the generation of a similar chemiosmotic gradient by light absorption or other energy-releasing pathways leading to production of carbohydrates, lipids, amino acids, and nucleotides.

MB 603 Nucleic Acid Biochemistry

Prerequisites: Undergraduate organic chemistry and biochemistry. Examines the biochemistry of nucleic acids, their function as genetic information and control over the expression of that information, nucleic acid-protein interactions, oncogenes and carcinogenesis.

MB 606 Molecular Genetics/Genomics

Prerequisite: Undergraduate molecular biology or biochemistry. The course combines information from the most recent genomic projects with traditional genetic research methods to provide novel understanding of the role of the genome as the blueprint of life. Emphasis is placed on exploring the expression of genes in the context of the activity and function of the whole genome. Topics include genome anatomy, functional genomics, regulation of the activity of the genome, genome evolution, proteomics, genome engineering, and computational genomics.

MB 607 Cellular Biology

An introduction to cellular structure and function. Examination of the role of biological membranes in cellular activity and forming functional compartments within organelles. The function of other cellular and extracellular structures, such as cytoskeleton and extracellular matrix. Additional topics include receptor structure and function, cellular signalling, differentiation, and motility.

MB 608 Evaluation of Scientific Literature

Prerequisite: Undergraduate genetics or molecular biology or biochemistry. This course introduces the student to the organization, use, and critical evaluation of scientific information. Print and electronic resources are explored through lectures, class discussion, and written assignments. Sources evaluated include basic reference works, journal articles, electronic databases, and the variety of information accessible via the Web. Upon completion of the course, students will have the ability to locate, retrieve, and critically evaluate information sources for further course work and research. In addition, they will be able to write their own scientific proposals.

MB 609 Data Analysis in the Environmental and Biological Sciences

Prerequisites: 9 graduate credits and a previous course in statistics, or permission of instructor. The application of data analysis techniques in the environmental (applied ecology, environmental geology, and chemistry) and biological (molecular biology, and toxicology) sciences. These include applied univariate and multivariate statistics as well as geostatistical and non-detect methods. Extensive use of different types of computer software for data analyses.

MB 611 Molecular Biology of Proteins with Laboratory

Prerequisites: MB 601 or undergraduate molecular biology and biochemistry. Techniques for working with proteins that are basic to the cell and molecular biologist, and that extend beyond the understanding of basic protein biochemistry. Course provides a theoretical understanding of methods commonly utilized for protein/peptide analysis. In the laboratory, students isolate proteins from various tissues or expression systems and analyze them by one- and two-dimensional polyacrylamide gel electrophoresis. 4 credits; laboratory fee.

MB 613 Molecular Biology of Nucleic Acids with Laboratory

Prerequisite: MB 603 or permission of the instructor. An examination of gene expression and the techniques available for manipulating DNA and RNA. This course utilizes an intense laboratory component to instruct students in the practical and technical aspects of working with nucleic acids. 4 credits; laboratory fee.

MB 617 Cell Culture Techniques with Laboratory

Prerequisite: Undergraduate cell biology or biochemistry or molecular biology. An intensive laboratory course designed to provide the student with the basic skills and understanding required for mammalian cell and tissue culture, and fundamental techniques in cell biology. Topics include aseptic technique, the culture environment, primary culture, maintenance of cultures, cloning and selection of cell phenotypes, proliferation and apoptosis assays, tumorigenicity assays, and experimental design. 4 credits.

MB 620 Bioinformatics

Prerequisites: MB 606 or permission of the instructor. Students will learn how computers and information technology are applied to manage and analyze the vast quantities of data now being collected by researchers and clinicians. Using a combination of theory and hands-on practice, the course will cover biological databases, analysis of nucleotide and protein sequences, sequence polymorphisms, sequence alignment, analysis of DNA microarray data and intermolecular interactions. An introduction to web page development, relational database design and Perl programming will also be covered.

MB 622 Database Systems for Biological Research

Prerequisite: Undergraduate molecular biology or biochemistry or permission of the instructor. Corequisite: MB 625. This course introduces students to the design, use, and application of database management systems in biological research. Topics include the relational data model, database design, structured query language, and common database architectures typically used in life sciences research. Emphasis is on problems common to

bioinformatics, including techniques for handling large quantities of data, integration of multiple data sets and analysis of generic data. Lab fee.

MB 625 Advanced Bioinformatics

Prerequisites: MB 620 Bioinformatics. This course builds on the material covered in MB 620, with an emphasis on developing custom solution and automating bulk data analysis. A significant portion of the class will be dedicated to learning aspects of the Perl programming language important for bioinformatics, such as manipulation of text files containing sequence data and pattern recognition. Using Perl, students will learn how to mine data from sequence databases and automate use of web-based analysis tools. Students will also enhance their knowledge of HTML and relational databases, and design and create a custom database as a class project.

MB 633 Nutritional Genomics

Prerequisite: MB 606 or permission of the instructor. The course introduces the principles of applying genomics, transciptomics, proteomics, metabolomics, and bioinformatics to human nutrition in order to understand how individual genetic variation can influence the assimilation and metabolism of nutrition, and how nutrition can affect the expression of certain genes known to be involved in chronic diseases. Novel genomic research tools that can study the effect of nutrition on different signaling pathways and dietary sensors are discussed. Using the information from the latest genomic research, clinical dietary strategies for the prevention of the development of chronic diseases such as cardiovascular disease, obesity, type 2 diabetes, and cancer are introduced. (See also NU 633.)

MB 636 Immunology

Study of the immune response in animals including cells and organs of the immune system, immunogens, MHC, cytokines, TCR, antibodies, and complement.

MB 644 Cellular Development

Prerequisite: MB 607. The course covers control of differentiation and development at the cellular level. Topics include cell cycle control, embryological development, programmed cell death, wound healing, and chronic wounds.

MB 648 Cytoskeleton and Extracellular Matrix

Prerequisite: MB 607. The cytoskeleton provides cues for patterns of division and the molecular motors needed for cell motility. The extracellular matrix also contains cues for the cells that are differentiating, providing highly localized signals and pathways for cellular migration. This course examines the roles of the cytoskeleton and extracellular matrix in cellular movement, differentiation, and function.

MB 650 Oncogenes and Cytokines

Prerequisite: MB 607. The products of oncogenes induce cancer in animals and transformed phenotypes in cultured cells. Often the products are analogues of cytokines or cytokine receptors. This course examines oncogenes and their role in transformation, cell cycle control, and cellular differentiation.

MB 656 Receptor Effector Systems

Prerequisite: MB 601 or MB 607. Cellular receptors and their effector systems are responsible for the ability of cells to detect and respond to stimuli. These proteins are of critical importance to the development of drugs to control the function of cells. This course examines the structure of receptors from ion channels to DNA binding proteins, followed by an examination of the signalling pathways that propagate the signal through the cell. Also covered are the design and interpretation of binding studies for receptor ligand interactions.

MB 670 Selected Topics

Prerequisite: Permission of instructor. An examination of topics of special interest to students and faculty. May be taken more than once.

MB 680 Graduate Seminar

Prerequisite: Permission of instructor. Weekly discussions of current scientific literature and student and faculty research projects. May be taken more than once. 1 credit.

MB 688 Internship I

Prerequisite: Permission of instructor. Laboratory and research experience are developed under the supervision of an outside researcher. A portion of the internship must be devoted to the completion of a research report. The instructor monitors the student's progress through regular meetings and evaluation of the final report.

MB 689 Internship II

Continuation of Internship I.

MB 690 Research Project

Prerequisite: Permission of instructor. An independent research project/program under the supervision of a member of the faculty.

MB 695 Independent Study I

Prerequisite: Permission of instructor. A planned program of independent study under the supervision of a member of the faculty.

MB 696 Independent Study II

Continuation of Independent Study I.

MB 698 Thesis I

Prerequisites: 15 graduate credits and permission of program coordinator. Supervised preparation of a thesis describing the student's research.

MB 699 Thesis II

Continuation of Thesis I.

Mechanical Engineering

ME 602 Mechanical Engineering Analysis

Topics in vector calculus and complex variables. Solution of partial differential equations as applied to mechanical engineering.

ME 604 Numerical Techniques in Mechanical Engineering

Prerequisite: Knowledge of C programming or FORTRAN. Corequisite: ME 632. Review of matrix algebra and simultaneous equations. Numerical integration and differentiation. Numerical methods for differential equations including techniques such as Euler, Runge-Kutta, Milne, shooting, Crank-Nicolson, and FEM. Emphasis on numerical solutions to ordinary and partial differential equations relevant to mechanical engineering.

ME 605 Finite Element Methods in Engineering

Prerequisite: ME 604. Basic concepts underlying the FEM. Displacement and weighted residual formulations of the finite element approach to numerical solutions. Applications to one- and two-dimensional problems in areas such as elasticity, heat transfer, and fluid mechanics.

ME 610 Advanced Dynamics

Kinematics and dynamics of single particles and systems of particles. Lagrange's equations. Hamilton's principle, and canonical transformation theory. The inertia tensor and rigid body motion.

ME 611 System Vibrations

Advanced techniques for analysis of vibrations in mechanical systems. Multiple degrees of freedom and random noise inputs are among topics covered.

ME 613 Fundamentals of Acoustics

Basic theory of acoustics in stationary media; plane, cylindrical, and spherical waves; reflection, transmission, and absorption characteristics; sources of sound; propagation and attenuation in ducts and enclosures.

ME 615 Theory of Elasticity

Index notation; Cartesian tensors and coordinate transformation; stress tensor and field equations; analysis of stress and strain in two and three dimensions; Airy stress function; applications to problems of torsion and bending; experimental methods.

ME 620 Classical Thermodynamics

Phenomenological equilibrium and nonequilibrium thermodynamics. Formulation and application of fundamental laws and concepts; chemical thermodynamics.

ME 625 Mechanics of Continua

Tensor analysis, stress vector and stress tensor, kinematics of deformation, material derivative, fundamental laws of continuum mechanics, conservation theorems, constitutive laws, and representative applications.

ME 627 Computer-Aided Engineering

Prerequisite: Consent of instructor. Integration of computers into the design cycle. Interactive computer modeling and analysis. Geometrical modeling with wire frame, surface, and solid models. Finite element modeling and analysis. Problems solved involving structural, dynamic, and thermal characteristics of mechanical devices.

ME 630 Advanced Fluid Mechanics

Advanced topics from among the following areas: perfect fluids, viscous fluids, turbulence, boundary layer theory, surface phenomena, shock waves, and gas dynamics.

ME 632 Advanced Heat Transfer

Prerequisites: ME 602 and consent of instructor. Corequisite: ME 604. The fundamentals of conduction heat transfer presented in a level that requires a good knowledge of partial (and ordinary) differential equations and a level of proficiency in numerical analysis.

ME 633 Convection Heat Transfer

Prerequisites: ME 602 and consent of instructor. Corequisite: ME 604. The fundamentals of convection heat transfer presented in a level that requires a good knowledge of partial (and ordinary) differential equations and a level of proficiency in numerical analysis.

ME 635 Dynamic Systems and Control

Introduction to the modeling of dynamic systems. Emphasis on the analysis of first and higher order continuous-time linear models. Feedback techniques with examples from various branches of mechanical engineering.

ME 638 Measurement and Instrumentation in ME

Measurement principles, including error analysis. Instrument systems: sensing, transmitting and terminating devices. Typical systems and devices for measuring motion, force, stress, strain, pressure, flow and temperature.

ME 642 Combustion

Prerequisites: ME 620, ME 630, ME 632, and consent of instructor. Review of chemical kinetics. Explosive and oxidative characteristics of fuels; premixed combustible gases; detonations and deflagrations; diffusion flames; non-volatile fuels; ignition.

ME 645 Computational Fluid Dynamics and Heat Transfer

Prerequisites: ME 604, ME 630. Current methods of computer solutions of the conservation equations of fluid dynamics. Viscous, incompressible, compressible, and shock flows. Real gas equations of state. Computer projects.

ME 647 Two-Phase Flow

Prerequisites: ME 620, ME 630, and ME 632, and consent of the instructor. An introduction to the thermophysics of phase-change phenomena in general, with specific treatment to the dynamic behavior of interfaces and to the vaporization and condensation processes in heat transfer equipment.

ME 651 Microscale Energy Transfer

Prerequisites: ME 610, ME 620, ME 630, ME 632, and consent of the instructor. Microscale energy transport in fast transient regimes in solids. Interfaces, liquid films, etc. Melting and freezing phenomena, Microscale radiation, Interfacial forces and Micro heat pipes.

ME 655 Interfacing Mechanical Devices

Prerequisite: Knowledge of C programming. Interfacing the real world of mechanical devices to a stand-alone PC. How to write C programs for monitoring and control of DC motors, encoders, stepper motors, AC heaters, and AC fans. Practical uses of thermal, mechanical, optical, and Hall Effect sensors.

ME 670 Selected Topics

Prerequisite: Permission of the instructor. A study of selected topics of particular interest to the students and instructor. May be taken more than once.

ME 690 Research Project

Prerequisites: 15 graduate credits and permission of program coordinator. Independent study under the guidance of a faculty advisor, such study terminating in a technical report of academic merit. Research may constitute a survey of a technical area in mechanical engineering, or may involve the solution of an actual or hypothetical technical problem.

ME 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

ME 696 Independent Study II

Continuation of Independent Study I.

ME 698 Thesis I

Prerequisite: 18 graduate credits. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

ME 699 Thesis II

Continuation of Thesis I.

Management

MG 610 The Sports Industry

Prerequisite: MG 637. Focuses on management concepts and business skills as they relate to the sports industry. An in-depth look at the organizational structure and method of operation of major sectors of the sports enterprise; examination of important contemporary issues in the sports industry.

MG 611 Sports Industry Marketing, Promotion, and Public Relations

Prerequisite: MK 609 or permission of instructor. A study of marketing, promotion, and public relations strategies utilized in various aspects of the sports industry. Marketing sports as a product and marketing nonsport products using sports as a promotional tool are examined.

MG 612 Sports Law

An analysis of contract law, tort law, antitrust law, labor law, collective bargaining, and administrative law as they apply to sports. Provides sports managers with the fundamental legal knowledge necessary to operate in the increasingly complex sports environment.

MG 613 Sports Facility Management

Prerequisite: MG 637 or permission of instructor. An examination of how sports facilities such as coliseums, municipal and college stadiums, and multipurpose civic centers are managed. Among the topics included are events booking and scheduling, box office management, staging and event production, personnel management, concessions, and merchandising management.

MG 617 Applied Fiscal Management for Sports and Facility Managers

Prerequisite: A 620 or permission of instructor. An examination of legal, managerial, accounting, and financial issues confronting sports, fitness, and recreation industry managers. Issues covered include tax law, bankruptcy, inventory management, capital instruments, accounting principles, financial statements, industry ratios, securing funds, and related concepts that help to determine the viability and strength of businesses in the sports industry. The focus is on applying basic financial management concepts to managerial decision-making.

MG 618 College Sports Administration

The objective of this course is to provide students with knowledge of the day-to-day operations of a collegiate athletic department. Through case studies, class projects, guest lectures, and on-site visits, students acquire the practical skills needed to manage a staff of coaches, administrators, student ath-

letes, and others. The activities of facility operations, travel, compliance, eligibility, financial aid, personnel, ticket operations, sports camps, and institutional control are examined.

MG 626 Design and Implementation of Benefit Systems

This course provides an overview of the issues, processes, successful practices, and policies involving benefit administration. The focus is on the relationship of benefit administration to strategic business planning. Topics include innovative welfare plan design, defined benefit systems, ERISA law, HRIS, and other related automated processes. Students acquire a working knowledge of welfare benefit plans, defined benefit systems, retirement plans, and recent innovations in consumer-driven health care and associated laws. Emphasis is placed on determining the impact of benefit policies on business profitability.

MG 627 Human Resource and Financial Decision-Making

This survey course focuses on financial concerns that impact HR and how an HR manager can become a more active participant in the boardroom through having a strong grasp of concepts such as payroll, taxes, budgeting, benefits, compensation, and deferred compensation administration.

MG 628 Building a Consulting Business

How to establish, manage and maintain a consulting practice. Topics include financing, marketing, client contacts, legal and accounting issues, and networking.

MG 630 Management Information Systems in Health Care

The use of computers in the health care field. Review of the history of information systems and their application in health care settings. Survey of problems and issues inherent to health care information management.

MG 637 Management Process

A study of the traditional functions of management: planning, organizing, directing, controlling, and coordinating, along with an analysis of human behavior in organizations and the exploration of new paradigms in business and management systems.

MG 640 Management of Health Care Organizations

Identification of the characteristics of health care organizations and the dimensions of management in such organizations. Examination and application of the principles of management necessary for the successful operation of health care organizations.

MG 645 Management of Human Resources

Prerequisite: MG 637 or P 619 or PA 601. A study of organizational practices in the management of human resources. Manpower planning, recruitment, selection, training, compensation, and contemporary problems of the field.

MG 650 Entrepreneurship

Prerequisites: FI 601, MG 637, and MK 609. Deals with the establishment of a new business venture, covering such topics as site development, market analysis, staffing, inventory control, personnel relations, and funding.

MG 655 Corporate Governance and Business Strategy

Prerequisite: MG 637. The primary participants who determine the direction and performance (i.e., governance) of corporations are the shareholders, the management, and the board of directors. The rights, obligations, and impacts of these direct participants are explored along with the roles that various corporate constituents can, do, and should play in determining corporate direction, strategy, and performance.

MG 656 Integrating the Enterprise

Prerequisites: MG 637, FI 601, and MK 609. This course focuses on developing a systemic understanding of an enterprise, integration of its functional parts as a cornerstone of its sustained competitive advantage, and creation of its unique business model to achieve it.

MG 662 Organization Theory

Prerequisite: MG 637. A survey of the literature on theories of organization, with emphasis on contemporary theories. Application of the theories to management and organizational problems are studied. Difficulties arising between theory and practice are examined.

MG 663 Leadership and Team Building

Prerequisite: MG 637 or P 619 or PA 625. Examination of the impact of theories and research findings relevant to leadership and team building in organizations. The role of the leader and teams in organizations; the knowledge and skills required for successful leadership and team building. Assessment of one's own leadership and team-building capabilities.

MG 664 Organizational Effectiveness

Prerequisite: MG 637 or P 619 or PA 625. Identification of the criteria necessary for developing and maintaining effective organizations. A study of the concepts that may be utilized in the management of these criteria. Approaches that may be examined and applied to problem situations through cases and role playing.

MG 665 Compensation Administration

Prerequisites: EC 625; MG 645 or P 620. A study of the compensation function in organizations. Establishing wages and salaries, fringe benefits, and incentives.

MG 667 Multicultural Issues in the Workplace

Prerequisite: MG 637 or P 619. Overview of theory and practice of diversity in the workplace; examination of the impact of changing workforce demographics on current and future productivity and competitiveness of organizations. Various forms of bias; methods for overcoming negative impact. Implementation of diversity programs; self-awareness of attitudes and behavior toward diverse groups. Issues addressed include gender, race, age, religion, sexual orientation, physical ability, and veteran status.

MG 669 Strategic Management

Prerequisites: Completion of all core courses and at least four of the advanced courses in the M.B.A. curriculum. This course examines management policies and strategies for the complex organization operating in a dynamic environment, from the viewpoint of top-level executives of the organization. It also develops analytic and systemic frameworks for the management of elements involved in assuring the fulfillment of the goals of the organization, and integrates the student's general business knowledge with knowledge acquired in the M.B.A. curriculum. Emphasis on development of oral and written skills by examination and discussion of cases, and by other appropriate instructional methods. Completion of a significant project is required as part of this course.

MG 670 Selected Topics

A study of selected issues of particular interest to students and instructor. May be taken more than once.

MG 671 Employment Law

Prerequisite: MG 645. This course provides students with an understanding of the nature and intent of various state and federal statutes governing the employment relationship. Topics like race and gender discrimination in the workplace, disability issues, the investigation of sexual harassment claims, workplace safety and health compliance, employee privacy issues, employee discharge and discipline procedures, the employment of aliens, and the nature of employee rights are analyzed in detail.

MG 678 Personnel Management Seminar

Prerequisites: EC 625; MG 637 or P 619; MG 645 or P 620. A seminar in the personnel and manpower management function of the modern work organization. The use of an integrated behavioral, quantitative, and systems approach permits an applied multidisciplinary synthesis of the various aggregate manpower management subsystems required in the modern work organization.

MG 680 Current Topics in Business Administration

Prerequisite: 15 graduate credits or permission of the instructor. An integrative course examining the role of business in society and relating the business firm to its social, political, legal, and economic environments. The content of this seminar varies from trimester to trimester with the varied academic interests and professional backgrounds of different faculty handling the course. The basic theme is the role of the business firm as the "keeper" of the market mechanism and the means for organizing resources in the economy.

MG 686 Global Business Simulation

Prerequisite: Completion of courses in accounting, marketing, and finance. This course is a business strategy simulation where teams of students run a company in a head-to-head competition against companies run by other class members. The company operations parallel those of actual companies operating globally in the same industry.

MG 690 Research Project

Prerequisite: 15 graduate credits or permission of the instructor. Independent study under the supervision of an advisor.

MG 694 Internship

Prerequisite: 24 graduate credits. An on-the-job learning experience with a selected organization, arranged for course credit and under the supervision of a faculty advisor. 3 or 6 credits.

MG 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

MG 696 Independent Study II

Continuation of Independent Study I.

MG 698 Thesis I

Prerequisite: 15 graduate credits. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

MG 699 Thesis II

Continuation of Thesis I.

Marketing

MK 609 Marketing

An intensive study of modern marketing fundamentals in a diverse, global economy; study of the decision-making problems encountered by marketing managers, using lectures and case studies.

MK 616 Buyer Behavior

Prerequisite: MK 609. An examination of the principal comprehensive household and organizational buyer behavior models and the behavioral science theories on which such models are based. Analysis of the buyer at the individual level, at the social level, and at the organizational level.

MK 632 Nonprofit and Services Marketing

Prerequisite: MK 609. An examination of the service product in for-profit and nonprofit organizations. Unique tools for analysis of service quality and the service encounter, including the roles of the customer and the service provider in service production, service expectations and scripts, and positioning. Communication and management strategies for service expectations, demand management, and organizational flexibility.

MK 638 Competitive Marketing Strategy

Prerequisites: MK 609 plus three additional graduate credits in marketing. Focuses on product, price distribution, and promotion strategies that give a company a competitive advantage. Also, corporate self-appraisal, market segmentation, and competitor evaluation.

MK 639 Marketing Research and Information Systems

Prerequisites: MK 609, QA 604. A managerial approach to marketing information flow, including recognition of information needs and an overview of marketing research as part of an information system. Special attention to evaluation of research design and measurement methods, effective utilization of research output, and problems encountered in establishing a marketing information system.

MK 641 Marketing Management

Prerequisites: MG 637, MK 609. A case-based review of the basic decision-making problems in marketing management, with an emphasis on information gathering and strategy. Topics include both U.S. and international problems in product, promotion, distribution channels, sales management, and pricing. Cases consider both physical products and services in the consumer and business-to-business environments.

MK 643 Product Management

Prerequisites: MG 637, MK 609. The search for new product ideas and their evaluation; the organizational structure necessary for the development and introduction of new products and the management of a product line; the commercial aspects of product design, packaging, labeling, and branding; considerations involved in making product deletion decisions; and the social and economic effects of managing product innovation.

MK 645 Distribution Strategy

Prerequisites: MG 637, MK 609. Analysis of channel strategies, theory, and economic justification of distribution channels; direct and indirect methods of control; behavioral states of channel members; costing the channel; and management of changes in distribution.

MK 651 International Marketing

Prerequisites: IB 644, MK 609. The application of marketing principles and techniques in a global environment. A managerial approach to international marketing as it pertains to product policies, market channels, pricing, and advertising in a foreign market. Emphasis on marketing in different cultural settings.

MK 670 Selected Topics

A study of selected issues of particular interest to students and instructor. May be taken more than once.

MK 690 Research Project

Prerequisite: 15 graduate credits or permission of the instructor. Independent study under the supervision of an advisor.

MK 693 Internship

Prerequisites: Six credits of MK concentration courses and approval of internship coordinator. A program of field experience in selected organizations in marketing and public relations.

MK 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

MK 696 Independent Study II

Continuation of Independent Study I.

MK 698 Thesis I

Prerequisite: 15 graduate credits. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

MK 699 Thesis II

Continuation of Thesis I.

National Security and Public Safety

NSP 601 National Security Programs: Architecture and Mission

An inquiry into the nature and scope of U.S. national security program architectures. Areas covered include current architectures, legal and regulatory basis, integrating national security programs into the agency's missions, developing security policies and strategies, and the oversight of the NSPs.

NSP 602 NSP Personnel Security Programs

A study of personnel security programs. Specific analysis of behavioral issues and their impact on loyalty and trustworthiness determinations. Students study government clearance processes and will be submitted for a clearance at the secret level.

NSP 603 National Security Charter, Legal Issues, and Executive Orders

An analysis of the legal framework, charter, and executive orders that guide the creation and operation of the U.S. intelligence community.

NSP 604 Securing National Security Information Systems

A comprehensive introduction to network security issues, concepts, and technologies. The core technologies of access control, cryptography, digital signatures, authorization, network firewalls, and network security services are reviewed. Issues in security policy and risk management are covered.

NSP 606 Contemporary Issues in National Security Programs

Students select from a range of topics relating to current issues and concerns within the national security architecture. Each student is required to write a paper and deliver an oral presentation on a selected topic.

NSP 607 Architecture of Protected Information

Students review contemporary theories and practices for the identification of information requiring or deserving protection, and evaluate how such protection may be achieved while allowing the use of the information. Contemporary legal principles and regulatory processes are explored, in both private and governmental sectors. The application of sound information security practices is reviewed, and program analysis models are explored.

NSP 610 NSP Cost Modeling and Contract Administration

An in-depth analysis of the federal acquisition process, costs of national security programs, and their role in meeting federal agencies' mission objective. A study of the relationships among the federal acquisition process, budget planning, and national security programs.

NSP 611 NSP Situational Evaluation and Failure Analysis Models

A comprehensive study of evaluation techniques and processes that measure scope and effectiveness of security programs. Students employ the use of situational analysis, failure analysis, case studies, and other research-oriented approaches.

NSP 612 Integrated Studies in Safeguards and Countermeasure Designs

A study of the selection of safeguards and countermeasures in support of national security programs. Examines the relationships among protection needs, mission accomplishment, available safeguards, and countermeasures. Analysis of the impact of the protective architecture and reconciliation with the budgetary and human resource realities.

NSP 613 NSP Issues in Research and Policy Analysis

An introduction to quantitative and qualitative methods used for research and policy analysis. Students become familiar with basic types of research designs, survey research methods, evaluation methods, descriptive statistics, and inferential statistics, and their application to national security programs.

NSP 620 Bioterrorism and Biodefense

This course provides a multidisciplinary approach to understanding terrorism, employing biological pathogens specifically, and terrorism in general. A new topic in academia, it crosscuts many established academic areas. It comprises the history, origins, motivations, and techniques used by many terrorists; preparedness, detection, treatment, and response during pre-, trans-, and post-attack times; government programs to prevent, prepare for, and respond to; and legal, economic, mental health, and policy issues. Lecture, discussion, a writing assignment, and a tabletop decision-making simulation are the teaching methods used. 1 credit.

NSP 621 National Security Incident Mapping

This course combines a variety of methods to introduce the various ways that terror risks can be analyzed, detected and prevented. In addition to bio-terror tabletop exercise, the class involves a problem-based learning project focused on assessing risk on critical infrastructures in a nearby neighborhood. Students are tasked with evaluating the various conceptual and technical tools available caused by terrorism, including crime mapping technology, crime risk assessments, and crime prevention through environmental design. The class will use the problem-based learning method in groups to tackle a specific set of real-life problems. This approach simulates real-life risk assessment and response scenarios, since group decision-making and problem-solving are important in assessing risk. Accordingly, students are evaluated on how they organize their research and planning activities and cooperate in their groups. 2 credits.

NSP 625 Information System Threats, Attacks, and Defenses

This course provides an overview of the actors, motives, and methods used in the commission of computer-related crimes, and describes the methods used by organizations to prevent, detect, and respond to these crimes. (See also CJ 625.)

NSP 626 Firewall and Secure Enterprise Computing

This course covers theory and practices of Internet firewalls and many of the details and vulnerabilities of the IP and embedded protocol sites. In the laboratory and online portion of the course students construct, deploy, and test a real firewall against common Internet attacks. (See also CJ 626.)

NSP 627 Internet Investigations and Audit-Based Computer Forensics

Theory and techniques of tracking attackers across the Internet and gaining forensic information from computer systems. The course includes case studies of Internet-based crimes, and addresses limits of forensic techniques. (See also CJ 627.)

NSP 628 Computer Viruses and Malicious Code

This course addresses theoretical and practical issues surrounding computer viruses. (See also CJ 628.)

NSP 629 Practical Issues in Cryptography

Examples of current historical cryptography and steganographic systems; major types of cryptosystems and cryptanalytic techniques, and how they operate; hands-on experience with current cryptographic technology. (See also CJ 629.)

NSP 630 Risk Assessment and Management in National Security

This course provides a multidisciplinary approach to understanding the concept and nature of risk in society, currently and historically. One goal of the course is to assess the role that risk and uncertainty have played in the development of a variety of public and private approaches to recognizing and resolving risks of loss. Lecture, discussion, a writing assignment and several individual and team presentations are included, along with several semi-structured, student-led case studies.

NSP 641 National Security World and National Threat Modeling

An analysis of threats, vulnerabilities, risks, and appropriate countermeasures that must be analyzed to model the United States world and national assessment strategy.

NSP 642 Integrated Studies of the Intelligence and Counterintelligence Communities

An introduction to the history, theory, principles, and objectives of U.S. intelligence and counterintelligence operations. Analysis of the impact on national security programs and objectives.

NSP 643 Seminar in Sensitive Evaluation, Techniques, Safeguards, and Countermeasures

Prerequisite: NSP 612. The analysis and study of the uses of classified techniques in national security programs, using the principles and techniques of the Integrated Studies in Safeguards and Countermeasure Designs course.

NSP 644 Cross-Impact Analysis: National Security Futures Issues

This course is an advanced examination of the uses of the Cross-Impact Analysis methodology. A non-traditional, problem-solving evaluation of national security issues with emphasis on estimating the likelihood and nature of anticipated events that may influence projected factors. A multidisciplinary approach is utilized, focusing on the implementation of empirically derived strategies in the analysis of national security futures issues.

NSP 645 National Security: Issues in Deception

To achieve and sustain high-performance during our national security enterprise requires focus, discipline, and imagination. It also requires thoughtful oversight, visionary leadership, and highly effective administration. This course provides students and security professionals with the opportunity to expand their knowledge and technology skills.

NSP 646 The Structure of National Security Decisions

This course provides a multidisciplinary approach to understanding the intuitive, structured, and deliberative nature of national security decisions. The limitations of the human mind along with political and organizational pressures combine to challenge national security decision-makers. The purpose of this course is to bias the odds of a wise decision in the decision-makers' favor. Lecture, discussion, a writing assignment and several individual and team presentations are included. In addition, several partially structured, student-led case studies will be presented to drive the discussions.

NSP 647 The Economics of National Security

This course explores the fundamental economic national security questions facing our society. How much of our national wealth is allocated currently to help ensure our national security? How and by whom is our national security budget determined? What is a life worth? How can a more cost-effective national security budget be achieved? These and other economic questions are explored in this far-reaching examination of national security economics.

NSP 648 Achieving Excellence in National Security Administration

This graduate course is a survey of the methods used by effective private sector managers and administrators to help ensure that their organizations achieve consistently high levels of performance. This survey is supplemented by focused conversations about how these well-researched and practical methods could be applied to administrative challenges within the American national security enterprise. Includes lecture, discussion, and student-led case studies.

NSP 651 A Study of Designated Approving Authorities Criteria

This course provides comprehensive coverage of the elements pertaining to a study of designated approving criteria in NSTISSI Standard 4012, and analyzes the information security functions of the designated approving authority.

NSP 652 System Administration in Information Systems Security

This course provides comprehensive coverage of the elements pertaining to a study of System Administration in Information Security as promulgated by NSTISSI Standard 4013, and analyzes the minimal performance standards of system administrators.

NSP 653 Information Systems Security Officers

This course provides comprehensive coverage of the elements pertaining to a study of Information Systems Security Officers as promulgated by NSTISSI Standard 4013 (E), and analyzes performance standards for the information system security officer at the entry, intermediate, and advanced levels.

NSP 654 Information System Approval and Certification

This course provides comprehensive coverage of the elements pertaining to the approval process for Information Systems and certifying authorities as designated by NSTISSI Standard 4015, and analyzes the INFOSEC functions of system certifiers.

NSP 668 Weapons of Mass Destruction I: Chemical and Biological Agents

An in-depth analysis of technological issues regarding protecting the public from biological and chemical agents that may be used as weapons of mass destruction (WMD).

NSP 669 Weapons of Mass Destruction II: Radiological Agents

Radiological materials pose a serious national security concern. This course provides an in-depth analysis of the scientific, technological, and policy issues involved in providing protection from the misuse of these agents.

NSP 670 Selected Topics

A study of selected issues of particular interest to the students and instructor.

NSP 680 Research Methods in National Security

An introduction to social science research methods used in national security for purposes of undertaking intelligence analysis. Students become familiar with basic types of research design; open source vs. classified research material, and will be exposed to qualitative and quantitative evaluation methods.

NSP 690 Research Project I

Individual guidance on a research endeavor.

NSP 691 Research Project II

Prerequisite: NSP 690. Individual guidance on a research endeavor.

NSP 693 National Security Internship I

The student's formal educational development will be complemented by field placement experience in various security settings or agencies. Accepted candidates are placed on summer assignments within an element (agency or industry) of the U.S. Government's national security program. Field experience is supervised by designated agency and department personnel.

NSP 694 National Security Internship II

Prerequisite: NSP 693. The student's formal educational development will be complemented by field placement experience in various security settings or agencies. Field experience is supervised by designated agency and department personnel.

NSP 695 Independent Study

A directed independent learning experience, the topic and format to be agreed upon by the student and supervising faculty.

NSP 697 Thesis I

Prerequisites: 15 graduate credits and approval of the instructor. Periodic meetings and discussions of the individual student's progress toward the completion of the thesis. Includes review of the literature and methodology (research design, survey instrument development, etc.). Minimum of six credits required (NSP 697 and NSP 698; NSP 699 optional at the discretion of the instructor).

NSP 698 Thesis II

Prerequisite: 15 graduate credits and approval of the instructor. Periodic meetings and discussions of the individual student's progress toward the completion of the thesis. This will include review of the literature and methodology (research design, survey instrument development, etc.). Minimum of six credits required (NSP 697 and NSP 698; NSP 699 optional at the discretion of the instructor).

NSP 699 Thesis III

Prerequisite: 15 graduate credits. Periodic meetings and discussions of the individual student's progress toward the completion of the thesis. This includes review of the literature and methodology (research design, survey instrument development, etc.). Minimum of six credits required (NSP 697 and NSP 698; NSP 699 optional at the discretion of the instructor).

Nutrition

NU 601 Nutritional Biochemistry I: Fundamentals

Prerequisite: Undergraduate course in organic chemistry or introductory biochemistry. Lectures examine the structures, properties, and metabolism of four major classes of bio-organics (carbohydrates, lipids, proteins/amino acids, and nucleic acids/nucleotides) with special attention given to their biologic roles and the nutritional aspects of their metabolism.

NU 602 Nutritional Biochemistry II: Applications

Prerequisite: NU 601. Lectures emphasize integration and control of metabolic pathways, and survey certain areas of biochemistry and molecular biology to understand their interconnections with genetics, disease, and patient management, including dietary modifications.

NU 603 Nutritional Physiology

Prerequisites: Undergraduate course in organic chemistry or introductory biochemistry, plus a course in human physiology or cell biology. Selected tissue/organ systems and their specific relation to nutrition. Overview of renal physiology, the endocrine system, essentials of gastrointestinal tract physiology, cardiovascular system, excitable tissues (nerve and muscle), cell physiology, cell membranes, and transport functions.

NU 604 Vitamin Metabolism

Prerequisites: NU 601, NU 603. Study and integration of the chemistry, biochemistry, physiology, pharmacology, and nutritional aspects of vitamin metabolism in humans. Chemical nomenclature; structure-function relationships; structural analogs and antagonists; methods and principles of measurement and assessment of status; food sources; digestion; absorption; transport; tissue uptake and distribution; intracellular metabolism; storage; excretion; biochemical function(s); correlation of clinical features of excess and deficiency with metabolic roles; vitamin-nutrient and vitamin-drug interactions; and the role of vitamins in therapeutics and prophylaxis.

NU 605 Mineral Metabolism

Prerequisites: NU 602, NU 604. Study and integration of the chemistry, biochemistry, physiology, and nutritional aspects of mineral metabolism in humans. Chemical forms; structural analogs and antagonists; methods and principles of measurement and assessment of status; food sources; digestion; factors influencing bioavailability; absorption; transport; tissue uptake and distribution; intracellular metabolism; storage; excretion; biochemical function(s); correlation of clinical features of excess and deficiency with metabolic roles; mineral-nutrient and mineral-drug interactions; and the role of minerals in therapeutics and prophylaxis.

NU 606 Cell and Molecular Biology of Human Nutrition

Prerequisite: NU 601 or permission of instructor. The relationship of nutritional science to the flow of information from DNA to protein. DNA replication, mutation, control of transcription and translation, signal transduction, the cell cycle, and genetic engineering.

NU 609 Research Methodology in Nutrition

The course focuses on understanding the methods of nutrition research. Topics include advantages/disadvantages of various study designs; tools used in dietary assessment; measurement and interpretation; and concepts and applications in nutrition from biostatistics and epidemiology.

NU 610 Nutrition and Disease I

Prerequisites: NU 602, NU 604. Discussion of certain disorders having nutritional implications; particular emphasis on the etiology and pathogenesis (including dietary factors), as well as diagnosis and treatment approaches (past and current). Rationales for inclusion of dietary alterations in the prophylactic and therapeutic approaches. Disorders include renal disease and hypertension; atherosclerosis and cardiovascular disease; energy balance, obesity, and eating disorders; cancer.

NU 611 Nutrition and Disease II

Prerequisites: NU 602, NU 604. Continuation of discussion of nutritionally related disorders begun in NU 610: diabetes mellitus; gastrointestinal disorders; hepatobiliary disease; acquired immune deficiency syndrome (AIDS); arthritis; osteoporosis; trauma and infection in the critically ill; other disorders, depending on significance and student interest.

NU 612 Nutrition and Health: Contemporary Issues and Controversies

Prerequisite: NU 605. Application of nutritional science to the maintenance of good health and body function after childhood. Topics will vary with student/faculty interests and current issues in nutritional science.

NU 613 Maternal and Child Nutrition

Prerequisite: NU 605 or permission of program coordinator. Physiology of pregnancy; maternal nutrition and outcomes of pregnancy; at-risk pregnancies; teratogens and teratogenic effect of nutrient deficiency or excess; nutrition and lactation; breast milk vs. formulas; nutrition and fertility; nutrition in growth and development; infant feeding and nutrition; and nutrient needs of children.

NU 614 Public Health Nutrition and Assessment

Prerequisite: NU 605. Interface between nutritional science and the broad area known as public health. Quantity, quality, and safety of the food supply; food additives and labeling; regulatory agencies; research approaches to food, nutrition, and disease; procedures used in nutritional assessment of individuals.

NU 615 Nutrition and Exercise for Performance and Health

Prerequisites: Introductory lecture course in biochemistry plus anatomy and physiology. The role of nutrition and physical activity in health promotion, disease prevention, and sports performance. Topics include exercise energetics, physiological responses, and training adaptations; ergogenic aids for performance enhancement; assessment of body composition and physical fitness; behavioral management for exercise adherence; effectiveness of physical activity on chronic disease prevention and treatment; and development of exercise prescriptions for clinical populations.

NU 633 Nutritional Genomics

Prerequisite: MB 606 or permission of the instructor. This course introduces the priniciples of applying genomics, transcriptomics, proteomics, metabolomics and bioinformatics to human nutrition in order to understand how individual genetic variation can influence the assimilation and metabolism of nutrition, and how nutrition can affect the expression of certain genes involved in chronic diseases. Novel genomic research tools, which can study the effect of nutrition on different signaling pathways and dietary sensors are discussed. Using the information from the latest genomic research, clinical dietary strategies for preventing chronic diseases such as cardiovascular disease, obesity, type 2 diabetes and cancer are introduced. (See also MB 633.)

NU 670 Selected Topics

Prerequisite: 15 graduate credits or permission of program coordinator. A study of selected issues of particular interest to the students and instructor.

NU 690 Research Project

Prerequisite: 15 graduate credits or permission of program coordinator. Independent research/project carried out under the supervision of a faculty advisor and resulting in a written report in the area of human nutrition.

NU 693 Human Nutrition Internship I

Prerequisite: B.S. degree in food, nutrition, or dietetics. The dietetic internship program provides between 600 and 1700 hours of required pre-professional experience in clinical nutrition, community nutrition, management, and research for students who have earned a B.S. degree in foods, nutrition, or dietetics. The dietetic internship program includes NU 693 and NU 694. Students accepted into an ADA-approved dietetic internship that is also approved by the Commission on Dietetic Education (CADE) may apply the internship experience toward completion of the master's degree. The NU 693 internship parallels course work in the UNH M.S. Human Nutrition program.

NU 694 Human Nutrition Internship II

Prerequisites: NU 693; B.S. degree in food, nutrition, or dietetics; permission from the instructor. The dietetic internship program provides between 600 and 1700 hours of required pre-professional experience in clinical nutrition, community nutrition, management, and research for students who have earned a BS degree in foods, nutrition, or dietetics. The dietetic internship includes NU 693 and NU 694. Students accepted into an ADA-approved dietetic internship that is also approved by the Commission on Dietetic Education (CADE) may apply the internship experience toward completion of the master's degree. The NU 694 internship parallels course work in the UNH M.S. Human Nutrition program.

NU 695 Independent Study

Prerequisite: 15 graduate credits or permission of program coordinator. A planned program of individual study under the supervision of a member of the faculty.

Psychology

P 605 Survey of Community Psychology

An examination of historical roots and current concepts. A social-problems approach to psychological dysfunction, emphasizing models of social support, prevention, and community, as well as strategies of empowerment and social change.

P 607 Special Problems in Community Psychology

Theory and practice of community psychology with selected problems, populations, and settings. Emphasis on human service issues and challenges in the region.

P 608 Psychometrics and Statistics

Prerequisite: Intermediate undergraduate course in statistics. Comprehensive introduction to fundamental conceptual and technical aspects of measurement and psychological description of individuals. In-depth treatment of statistical issues such as advanced correlation and regression techniques using SPSSx statistical software to enhance understanding of key concepts. Emphasis on application of measurement and statistics to psychological assessment in field settings.

P 609 Research Methods

Prerequisite: P 608. Introduction to analytic concepts pertinent to sampling techniques, research design, variable control, and criterion definition. Basic problems of measurement, research paradigms, sources of error in research interpretation, problems of variable identification and control, and consideration of the logic of inference.

P 610 Program Evaluation

Prerequisite: P 609. The systematic study of the processes involved in planning, implemention and impact of organizational programs. The focus is on action research strategies that integrate the entire evaluation process.

Practicum Seminars and Fieldwork (P 611–P 616):

An apprenticeship or on-the-job role in an ongoing program or agency. Placement at a field site for 8 to 10 hours per week. Emphasis on developing conceptualizations and insights as a result of involvement in the apprenticeship. Weekly class meetings serve two purposes: to present theoretical material and research findings appropriate to each seminar, and to allow students to discuss their field training experiences. A comprehensive project report is required in which students analyze and integrate fieldwork experience with relevant research and course work.

P 611 Individual Intervention Seminar

An examination of strategies for providing direct services to individuals within the context of formal and informal networks of social and community support. Includes the nature of the dyadic relationship, development of therapeutic and case management skills, professional ethics, and supervision. Applications to a wide range of problems, populations, and settings.

P 612 Consultation Seminar

An examination of the consultation process. Includes the role of the consultant, stages of consultation, the development of consulting skills, and political/ethical issues. Different approaches to consultation practice are analyzed, along with their associated interventions.

P 613 Systems Intervention Seminar

An examination of the dynamics of planned, system-level change in the field of human services. The distinctive characteristics of human service organizations are analyzed, and an overall intervention model is developed, applied, and discussed. This seminar is of special interest to those with responsibilities in program planning and implementation.

P 614 Individual Intervention Fieldwork

Prerequisite: Permission of instructor. Supervised field training in the provision of direct services to individual clients. Supervision is provided jointly by the field setting and the Psychology Department. Students must be available at least one day per week.

P 615 Consultation Fieldwork

Prerequisite: Permission of instructor. Supervised field training in the development of consultation skills. Supervision is provided jointly by the field setting and the Psychology Department. Students must be available at least one day per week.

P 616 Systems Intervention Fieldwork

Prerequisite: Permission of instructor. Supervised field training in program planning and development. Supervision is provided jointly by the field setting and the Psychology Department. Students must be available at least one day per week.

P 619 Organizational Behavior

Analysis of various theories of business and managerial behavior emphasizing the business organization and its internal processes. Psychological factors in business and industry, including motivation, incentives, and conflict. A study of research findings relevant to an understanding and prediction of human behavior in organizations.

P 620 Industrial Psychology

Prerequisite: P 608 or QA 604 or permission of instructor. Psychological theories and research applied to typical human resource functions in organizations. Topics include selection and placement, job analysis and competency modeling, training and development, performance appraisal, compensation, and human resource planning.

P 621 Behavior Modification I: Principles, Theories, and Applications

Theory and research in behavior modification. Aversive learning, desensitization, operant conditioning. Applications in clinical and nonclinical settings.

P 623 Psychology of the Small Group

Analyses of the behavior and interaction of people in mutual gratification groups, committees, work groups, and clubs.

P 624 Experiential Self-Analytic Group

This experiential group develops an understanding of group and interpersonal dynamics through analysis of ongoing interaction, and improves participants' interpersonal abilities relevant to organizational consulting and diagnosis.

P 625 Life Span Developmental Psychology

In-depth exploration of normal and abnormal development through the

life cycle. Emphasis on childhood, adolescence, adulthood, and later years. Developmental impact of family, neighborhood, schooling, work, and culture. Issues of class, ethnicity, gender, age, etc. Applications of theory and research to community treatment and prevention.

P 626 Worker Well-Being

This course provides an overview of the frameworks, theories, critical issues, and practices associated with the psychological well-being of people in the workplace. The study of worker well-being, a sub-area of occupational health psychology, includes topics such as work-life integration, alternative employment schedules and employment relationships, antecedents, moderators and consequences of work stress, and organizational interventions to facilitate the health and well-being of workers in organizations.

P 628 The Interview

The interview as a tool for information gathering, diagnoses, mutual decision-making, and behavior change. Use of role playing provides the student with insights into nuances of interpersonal relationships. Applications to selection, counseling, and other situations.

P 629 Introduction to Psychotherapy and Counseling

Theory, research, and practice of psychotherapy and counseling. Examination of the assumptions, roles, and processes of the therapeutic relationship.

P 632 Group Treatment and Family Therapy

Introduction to group and family approaches to psychotherapy. Factors important to the successful therapeutic group are discussed.

P 634 Personality Assessment

A critical survey of theories and issues of personality assessment. Includes intelligence, achievement, and ability assessment. Ethical questions associated with psychological testing are addressed. Laboratory fee required.

P 635 Psychological Tests and Measurements in Industry

Prerequisite: P 608 or permission of instructor. Theories, assumptions, and constraints underlying construction and application of psychological tests and measures in industry. Emphasis on selection, validation, and interpretation of appropriate standardized tests and surveys for specific applications in organizations, such as employment testing and employee attitude assessment.

P 636 Abnormal Psychology

Etiological factors in psychopathology dynamics and classification of neuroses, psychophysiologic conditions, psychoses, personality disorders, organic illnesses, developmental disorders, and childhood diseases.

P 638 Psychology of Communication and Opinion Change

Characteristics of the source, the situation, and the content of messages, along with other variables influencing attitudinal modification. Cognitive factors and social settings in attitude change.

P 640 Industrial Motivation and Morale

Prerequisite: P 619. The meaning of work, theories of motivation, values and expectations, performance and reinforcement, job satisfaction and motivation, pay as an incentive, and interventions to increase work motivation.

P 641 Personnel Development and Training

Identification of skills and developmental needs, from both organizational and individual perspectives. Techniques for assessment and development of skills, especially at the managerial level. Training approaches; evaluation of training efforts.

P 642 Organizational Change and Development

Prerequisite: P 619 or MG 637. The nature of organizational development, intervention by third-party consultation, change in organizational structure and role relationships, evaluation of change efforts, participation, conformity, and deviation.

P 643 The Psychology of Conflict Management I

The constructive management of conflict at the individual, corporate, and multicultural levels. Theories on the etiology of conflict as well as various conflict resolution models. The role of communication and perspective-taking in the constructive resolution of conflict. Students learn to manage more constructively their own personal conflicts as well as conflicts occurring at the corporate and multicultural levels.

P 644 Performance Appraisal Systems

Theory and applications associated with performance appraisal systems in organizations. Topics include setting relevant performance goals, the performance review session, coaching and counseling, multisource feedback, and rewards and recognition. Emphasis is on the development and implementation of valid and effective appraisal systems.

P 645 Seminar in Industrial/Organizational Psychology

Prerequisites: P 609, P 619. An examination of the professional psycholo-

gist at work in organizations. Topics include measurement methods, prediction, validation, selection, training and employee assistance programs, group dynamics, organizational change, stress, and performance appraisals. Practitioners in business, industry, research organizations and government will provide insights into the application of psychological principles and methods.

P 646 The Psychology of Negotiation and Mediation

Students are trained in basic negotiation and mediation skills with supervised practice of these skills. Skill development enables students to resolve conflicts more effectively as well as to help build the tools necessary for those interested in becoming mediators or organizational consultants specializing in conflict management.

P 647 Industrial and Organizational Psychology in Global Settings

Prerequisites: P 619, P 620, or permission of instructor. Surveys the science and practice of international industrial and organizational psychology. Introduces current perspectives and applications on topics including multinational work teams, selection and training of expatriates, leadership behavior, performance improvement and rewards across cultures, and individual cross-cultural similarities and differences. Focuses on comparisons with corresponding U.S. systems.

P 656 Abnormal Psychology in Forensic Populations

Prerequisites: Undergraduate or graduate course in abnormal psychology, CJ 601. This is an advanced course in mental disorders associated with prisons and other forensic practice. Emphasis is on disorders involving violent and predatory behavior including personality disorders, psychosis, pedophilia, and other sexual paraphilias. Special emphasis on psychopathy, psychopathology, and criminal behavior. Well-known forensic cases are examined. This course is a prerequisite for all other courses in the forensic psychology sequence. (See also CJ 646.)

P 657 Forensic Assessment

Prerequisite: CJ 646. This course reviews the spectrum of assessment methods used in evaluation and treatment in inmate and forensic settings. Various techniques of forensic interviewing are examined, with emphasis on ability to assess violence and risk. Students will come to understand the strengths and limitations of a wide variety of forensic assessment methods. Additional attention is given to techniques to assess malingering. (See also CJ 647.)

P 658 Forensic Treatment Models

Prerequisite: CJ 647. This course examines various mental health treatment modalities, with particular emphasis on treatment for patients/inmates in the forensic system. Psychopharmacology, group therapy, cognitive techniques, community-based management, faith-based approaches, and social skills training are covered. Treatment of insanity acquittees, incompetent-to-stand-trial patients, inmates, juvenile offenders, psychopaths, and sex offenders are examined. Management of high-risk forensic populations is covered. Particular emphasis on current research findings regarding the effectiveness of these approaches with forensic populations. (See also CJ 648.)

P 660 Contemporary Issues in Industrial/Organizational Psychology

Prerequisite: 12 hours in psychology or consent of the instructor. In-depth investigation of topical areas of concern in industrial/organizational psychology. Topics may include, but are not limited to, the impact of EEOC regulations on selection and promotion; assessment centers; the role of the consultant in organizations; flextime, day care, and other strategies to accommodate family needs of employees; stress in work settings; women in management. Content will be stated at the time the course is scheduled. Students may petition for a particular topic they feel would fit their academic goals. May be taken twice.

P 670 Selected Topics

A study of selected issues of particular interest to students and instructor. May be taken more than once.

P 678 Practicum I

For students already employed full time. A job-related research project is carried out under faculty supervision.

P 679 Practicum II

Continuation of Practicum I.

P 693 Organizational Internship I

For students without experience at the managerial or supervisory level. Under faculty supervision, the student engages in field experience in an industrial setting and produces a comprehensive project report analyzing the internship experience.

P 694 Organizational Internship II

Continuation of Organizational Internship I.

P 695 Individual Intensive Study I

Prerequisites: completion of required courses or 24 graduate credits and written approval of department chair. Provides the opportunity to delve more deeply into a particular area of study under faculty supervision.

P 696 Individual Intensive Study II

Continuation of Individual Intensive Study I.

P 698 Thesis I

Prerequisites: Completion of all required courses or 24 graduate credits and written approval of department chair. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

P 699 Thesis II

Continuation of Thesis I.

Public Administration/ Health Care

PA 601 Principles of Public Administration

The development, organization, functions, and problems of national, state, and local governmental administration.

PA 602 Public Policy Formulation and Implementation

The relationship between public administration and the formulation of public policy. The implementation of public policy based on the politics of the administrator in terms of interaction between group representatives such as legislators, politicians, and pressure-group leaders.

PA 604 Communities and Social Change

Interactions among the community as a social organization, and educational, police, and welfare institutions within it; special attention to conceptual frameworks and current research or action programs that particularly affect minority groups.

PA 611 Research Methods in Public Administration

Recommended: Undergraduate course in quantitative methods or introductory statistics. Designed to familiarize administrators with the tools and potentialities of social research and to assist them in the presentation, interpretation, and application of research data.

PA 620 Personnel Administration and Collective Bargaining in the Public Sector

Recommended: PA 601. Study of the civil service systems in the United States and state governments, including a systematic review of the methods of recruitment, promotion, discipline, control, and removal. Explores the effects on work relationships of collective bargaining statutes that have been adopted by legislatures. Emphasis is placed on collective bargaining case studies from state and local governments and hospitals.

PA 625 Administrative Behavior

Recommended: PA 601. The problems faced by an administrator in dealing with interpersonal relationships and human processes. Analysis of individual and group behavior in various governmental and business settings to determine the administrative action to promote desired work performance. Emphasis given to the public sector. Participation in actual problem situation discussions and case studies.

PA 630 Fiscal Management for Local Government

Recommended: PA 601. The problems faced by a survey of the essential principles of governmental accounting, budgeting, cost accounting, and financial reporting. The various operating funds, bonded debt, fixed assets, investments, classification of revenue and expenditures, general property taxes, and interfund relationships.

PA 632 Public Finance and Budgeting

Recommended: PA 601. State and local expenditure patterns and revenue sources, income taxation at the state and local levels, excise taxation, sales taxation, taxation of capital, and the property tax. Emphasis on fiscal and economic aspects of federalism and federal/state fiscal coordination. The role of the budget in the determination of policy, in administrative integration, and in control of government operations.

PA 641 Financial Management of Health Care Organizations

Recommended: MG 640. Theory and application of financial planning and management techniques in health care organizations. Emphasis on financial decision-making and on preparation of short- and long-term cash, capital, revenue and expense budgets, and financial plans to meet the requirements of HCFA and other third parties.

PA 642 Health Care Delivery Systems

An analysis of contemporary health care delivery systems in the U.S. Financial, cost, economic, political, and organizational issues are discussed.

PA 643 Health and Institutional Planning

Designed to develop skills in and understanding of the dynamics of health and social planning processes with respect to consumer demand, national and local health goals, and the optimal location of facilities, services, and manpower.

PA 644 Administration of Programs and Services for the Aged

The structure, function, and properties of publicly and privately funded programs and service organizations providing health services to the aged. The economic, political, legal, and social issues that affect the administration of human service organizations are studied, with emphasis on administration of health care services.

PA 645 Health Care Economics and Finance

Recommended: PA 641. Integration of accounting, economics, finance, budgeting, and health insurance principles, concepts, and analytic tools essential to the decision-making processes of health care organizations.

PA 646 Organization and Management of Long-Term Care Facilities

Examines the variety of systems providing long-term care services for the aged. Special concentration on the ways various facilities are managed and on the impact of state bylaws. Case studies illustrate decision-making and problem-solving within health institutions.

PA 647 Alternative Health Care Delivery Systems

A survey of nontraditional approaches to health care. Includes cost-shifting, cost-sharing, the development of outpatient facilities, and the impact of cost containment regulation in a systems-oriented framework.

PA 648 Contemporary Issues in Health Care

Gives health care professionals a broad view of current topics in their field. Students view current videotapes, work on case studies, participate in class exercises, and present several reports. Current articles illustrate the issues under discussion.

PA 651 Health Care Ethics

Explores and defines a wide spectrum of critical ethical issues factors to consider in resolving these issues and investigation of ways in which organizations can anticipate and plan for future ethical problems.

PA 652 Introduction to Managed Care

Managed care concepts including types, structures, financial incentives, administrative tools, and marketing approaches; relationships between provision of medical care and various types of managed care organizations; emphasis on health maintenance organizations (HMOs) and preferred provider organizations (PPOs). Management structures, quality assurance, utilization management, financial functions, and health insurance alternatives.

PA 653 Cost Containment in Health Care

Overview of methods used to attempt to contain the rise of health care costs; practical approaches to cost containment as well as skills necessary to implement and evaluate cost containment strategies.

PA 657 Health Care Reimbursements

Ways in which reimbursements are regulated and collected; financial implications of third-party reimbursements for all types of health care providers. Focus on history as well as current and future programs related to the most complicated payment methods in any industry.

PA 659 Human Resource Planning in Health Care

Exploration of principles and functions of human resource planning in a health care organization. Topics include legal and public policy parameters, demographics and the health care workforce, disparate employee groups and their special concerns, and implementation and evaluation of human resource planning in health care settings.

PA 661 Problems of Metropolitan Areas

Analysis of the problems of government and administration arising from the population patterns and physical and social structures of contemporary metropolitan communities.

PA 664 Survey of Medical Group Management

Business management in the physician group-practice arena. Beginning with the start-up phase, complete coverage of the process. Current as well as future directions in physician group management and ways to enhance its profitability.

PA 669 Health Care Policy, Planning, and Execution

Prerequisites: MG 630, MG 640. Overview of methods used in strategic planning. Practical approaches to management techniques, financial planning, cost containment, service delivery, and strategies in strategic management.

PA 670/671 Selected Topics

A study of selected issues of particular interest to students and instructor. May be taken more than once.

PA 680 Seminar in Public Administration

Exact material to be covered will be announced.

PA 681 Long-Term Health Care Internship I

Prerequisites: PA 641, PA 646. First of two state-required internships for eligibility to take the State of Connecticut licensing examination in long-term care administration. Course consists of a 450-hour nursing home internship.

PA 682 Long-Term Health Care Internship II

Continuation of Long-Term Health Care Internship I.

PA 683 Long-Term Health Care Internship

Prerequisite or corequisite: PA 646. Course consists of 500 hours in a skilled nursing facility. This course is available only to students who have completed at least 45 hours of an appropriate graduate program. Contact the Director, Health Care Program, for further information.

PA 690 Research Seminar

Recommended: PA 611. Requirements include an extensive independent research study and participation in an integrative seminar on research and its uses in public administration, health care administration, labor relations, and related disciplines.

PA 693 Public Administration Internship
Prerequisites: 15 graduate credits and permission of the program coordinator. A supervised work experience in a cooperating public service agency. Students must be available at least one day per week.

PA 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

PA 696 Independent Study II
Continuation of Independent Study I.

PA 698 Thesis I
Prerequisite: 15 graduate credits. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

PA 699 Thesis II
Continuation of Thesis I.

Physics

PH 613 Radioactivity and Radiation in the Environment
Prerequisites: EN 600 and CH 601, or permission of instructor. Basic principles of nuclear structure and radioactivity; the interaction of radiation with matter and biological effects of radiation; natural and man-made sources of radiation in the environment. The second half of the course focuses on long-term environmental effects of radiation accidents (e.g., Chernobyl) and the problems of nuclear waste disposal, plutonium inventories from nuclear weapons, natural radon in buildings, and similar concerns. (See also EN 613.)

PH 670 Selected Topics: Physics
Prerequisite: Permission of the instructor. A study of selected topics of particular interest to students and instructor. Course may be taken more than once.

Philosophy

PL 601 Business Ethics
Problems include the nature of the corporation, the values of business activity, corporate social responsibility, the proper relationship between the corporation and government, employee rights, and related matters. Problems are analyzed using the most important current theories of social and economic justice.

PL 614 Philosophy of Education
A critical analysis of education in contemporary society as reflected in the thinking of modern and early philosophers. (See also ED 614.)

Political Science

PS 601 Constitutional Law
A study of the judicial process and its relationship to the Constitution and the political system in the United States. Examines the role of the Supreme Court in shaping judicial review, federalism, civil rights, and liberties, equal protection, and due process.

PS 602 Civil Liberties and Rights
An analysis of civil liberties, civil rights, due process, and equal protection under the law. An examination of the role of the public official in the protection, denial, or abridgment of the constitutional and legal rights of individuals.

PS 603 International Law
A study of the role of international law in the modern state system with particular reference to individuals; territorial jurisdiction; law of the sea, air, and space; and the development of law through international organizations.

PS 604 Human Rights and the Law
An examination of the development of the international and national laws establishing human rights; the laws of war, war/criminality, and crimes against humanity, and the application of the universal declaration of human rights, of the Helsinki Accords, and of the concept of the individual as the basis of law.

PS 605 Criminal Law
Scope, purpose, definition, and classification of criminal law. Offenses against persons, habitation and occupancy offenses against property, and other offenses. Special defenses. Emphasis on the Connecticut penal code.

PS 606 Advanced International Relations
Basic elements of international life relevant to the growth of a stable and peaceful global political-economic system. Includes power, diplomacy, law, trade, aid, monetary affairs, multinational corporations, and differing geographical and cultural characteristics.

PS 608 The Legislative Process
An analysis of the legislative process in the American political system. Emphasis on legislative politics in state and local government. Includes legislative functions, selection and recruitment of legislative candidates, legislative role orientations, the legislative socialization process, the committee system, legislators and their constituencies, legislative lobbyists, legislative decision-making, legislative-executive relations, and legislative organization and procedures.

PS 610 Legal Methods I
A study of procedure and process of the law as it applies in the American system, and an introduction to legal research and writing.

PS 612 Contracts, Torts, and the Practice of Law
An introduction to the most important components of private law—contracts, torts, and civil procedure and their application to business, government, and individuals.

PS 615 Jurisprudence
The general philosophical framework for the law. Includes the background and development of common law, sources of the law, and the court system. Special problems in Anglo-American jurisprudence are reviewed.

PS 616 Urban Government
An examination of the urban political system. Emphasis on the political aspects of urban government structures. Includes formal and informal decision-making in urban government, community power structures, types of urban government structures, the politics of intergovernmental relations, and the politics of servicing the urban environment (social services, planning agencies, education, housing, transportation, health, pollution control and ecology, revenue sharing, public safety, and neighborhood corporations).

PS 617 Law, Science, and Ethics
The intersection of law, science, and ethics in a variety of contexts, including experimentation with human subjects, psychosurgery, genetic engineering, organ transplants, abortion, and the right to die.

PS 625 Transnational Legal Structures
An introduction to the basic structure of legal systems in other countries, their relationship to Anglo-American law, and their contextual development. Special topics include legal status of foreign and multinational corporations, rights and responsibilities of aliens, protections for investors, expropriation, and procedural due process.

PS 626 Decision-Making in the Political Process
An in-depth study of decision-making in the American system with special emphasis on the various types of mechanisms: executive, legislative, judicial, bureaucratic, organizational, and military. The influences of intelligence, economic, and psychological factors, as well as social pressure on decisions and decision-makers are examined.

PS 628 Change and Government
A study of the major processes of change and their consequences for the functioning of government. Concentrates on changes that may occur through violence, evolution, or technology, and that may alter the effective operation of government.

PS 633 The Political Process and the Aged
A study of the political process as it relates to the aged. Governmental decision-making on federal, state, and local levels including legislation and its implications.

PS 635 Law and Public Health
A course for the civil servant or health professional concerned with laws relating to the public health at the federal, state, and local level, as well as the practical administration of those laws.

PS 640 Law and Education
An examination of the legal and educational issues arising from factors such as EEO, student rights, student financing, and the relationships between schools and government.

PS 641 The Politics of the World Economy
An examination of the global politico-economic system and the challenges facing world diplomacy: multinational corporations and political structures designed to coordinate global policies for the monetary and trade systems; international organizations and their impact on Third World development; and problems facing industrialized nations.

PS 645 Government and the Industrial Sector
The various impacts of government regulation on the corporate sector and the major legal and regulatory requirements affecting business and industry.

PS 655 Conflict Resolution
Essential features and methods available within the legal system to resolve disputes, including the uses of law, equity, administrative agencies, bureaucracies, arbitration, mediation, special commissions, and private self-help. Applicability of these methods to various types of disputes and the choice of law in instances when no single rule may govern in a federal system.

PS 670 Selected Topics
A study of items of special interest. May include First Amendment problems, energy and the law, law and the environment, labor legislation and the law, law and commercial paper, and stock issues. May be taken more than once.

PS 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

PS 696 Independent Study II
Continuation of Independent Study I.

Quantitative Analysis

QA 604 Probability and Statistics
Statistical methods and theories used in solving business problems. Topics include data analysis, discrete and continuous probability distributions, statistical inference and estimation, regression and correlation analysis, the analysis of variance, decision the-

ory, and nonparametric tests including chi-square. Students will use computers to conduct statistical tests using the information presented.

QA 605 Applied Statistics

Prerequisite: QA 604. Includes regression and correlation, multiple regression, analysis of variance, the general linear model, and an introduction to time series analysis and forecasting techniques.

QA 607 Forecasting

Prerequisite: QA 605. A wide range of forecasting methods useful to students and practitioners of management, economics, and other disciplines requiring forecasting. Focus on quantitative techniques of forecasting; includes smoothing and decomposition approaches, multiple regression and econometric models, and autoregressive/moving average methods including generalized adaptive filtering and Box-Jenkins methodology.

QA 614 Decisions in Operations Management

Prerequisites: MG 637, QA 604, or equivalents. Study of organizations as systems producing goods and services. Review of concepts, functions, and basic techniques as applied to operations management. Examination of new trends and developments such as just-in-time, synchronous manufacturing, quality management, cycle-time reduction, and concurrent engineering. Emphasis on interrelations of different operational decisions on the final product and competitive position of the organization.

QA 638 Cost-Benefit Management

Prerequisites: EC 601, FI 601, and QA 604. An introduction to and overview of the field of cost benefit management. Fundamental theoretical evaluation of cost-benefit of a project. Includes selection of the best investment criteria, external environment spillover effects, and the application of cost-benefit management decision-making under uncertainty.

QA 670 Selected Topics

A study of selected issues of particular interest to students and instructor. Course may cover decision science methods such as experimental design, nonparametrics, data analysis with SPSS, Bayesian decision theory, and simulation. May be taken more than once.

QA 675 Computer-Aided Multivariate Analysis

Prerequisite: QA 604 or equivalent. Summary, for students and researchers, of several widely used multivariate statistical analysis techniques and computer packages. Topics include the nature and concept of scientific problem solving, applied regression analysis and its limitations, multiple frequency analysis, profile analysis of repeated measures, canonical correlation analysis, discriminant analysis, cluster analysis, principal components analysis, and factor analysis.

QA 690 Research Project

Prerequisite: 15 graduate credits or permission of the instructor. Independent study under the supervision of an advisor.

QA 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

QA 696 Independent Study II

Continuation of Independent Study I.

QA 698 Thesis I

Prerequisite: 15 graduate credits. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

QA 699 Thesis II

Continuation of Thesis I.

Occupational Safety and Health

SH 605 Industrial Safety Engineering

An analysis of the major physical hazards in industrial work and the attendant safety practices employed to eliminate the hazardous conditions or minimize the likelihood and extent of injury. Includes the hazards associated with machinery, combustion, electricity, material handling, and fire.

SH 620 Occupational Safety and Health Law

A survey of the major federal occupational safety and health laws, with an emphasis on the Occupational Safety and Health Act of 1970 as well as state worker's compensation laws. Focus on the administration of the laws, their major provisions, and the enforcement process, as well as the federal/state interrelationships in this milieu.

SH 630 Product Safety and Liability

An investigation into legal pitfalls and human concerns inherent in the marketing and consumption of goods: seller's responsibility, product liability, insurance, and labeling requirements. The Consumer Product Safety Act and related acts, and procedures for minimizing legal risk and maximizing human safety and health.

SH 665 Industrial Hygiene Measurements

Theory and practice of current methods and techniques applicable to industrial hygiene. Experiments in ventilation, non-ionizing radiation, measurement of the airborne contaminants, noise, and heat stress.

SH 667 Control of Occupational Health Hazards

Advanced study of methodologies used to control exposures to workplace agents that cause illness and/or

disease. Primary focus on techniques used to minimize employees exposures; full discussion of personal protective devices.

SH 690 Research Project I

Prerequisite: Permission of the instructor. Independent study under the supervision of an advisor. 1–3 credits.

SH 691 Research Project II

Continuation of Research Project I. 1–3 credits.

Sociology

SO 601 Minority Group Relations

An interdisciplinary survey of minority groups in the United States with special reference to ethnic, religious, and racial factors that influence interaction.

SO 610 Urban Sociology

Prerequisite: PA 604. The problems of urban growth and development. Residential patterns together with the physical development of cities and their redevelopment. An examination of the people and their relationships to the environment.

SO 620 Sociology of Bureaucracy

A study of some of the classic conceptualizations of bureaucracy and their relevance to the structure and functioning of American economic and governmental institutions. Gives students informational and experiential resources with which they, as planners and managers, can improve their ability to make effective policy decisions.

SO 641 Death and Suicide

In-depth analysis of suicide. Traditional theories of suicide are analyzed regarding the psychological approach as well as the demographic and group analysis of sociology. The goal of the course is both academic and practical, stressing community application.

SO 649 Seminar in Health and Social Policy

Analysis of the legal, political, social, economic, and organizational factors in planning and providing health care services, with emphasis on policy formulation and implementation. Current health policy issues.

SO 651 Social Gerontology

Introduction to the field of gerontology. Discusses the history and definition of the field, the contributions of academic disciplines to the field, and various perceptions of aging. Explores the basic theories, problems, and prospects of gerontology.

SO 670 Selected Topics

A study of selected issues of particular interest to the students and instructor. May be taken more than once.

SO 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

SO 696 Independent Study II

Continuation of Independent Study I.

SO 698 Thesis I

Prerequisite: 15 graduate credits. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

SO 699 Thesis II

Continuation of Thesis I.

Tourism and Hospitality

THM 920 Strategies for Event Planning

Prerequisite: Consent of the instructor. Strategies necessary for event planning involve management, planning, budgeting, costing, marketing, escorting, and evaluation of group tour principles. Principles involve goals and objectives, economic impact, monitoring, and control to assure proper plan implementation. Additional related issues are addressed.

University Courses

UNIV 601 Oscar Schindler Humanities

An investigation of the underlying principles of good human behavior with an emphasis on encouraging such behavior. Taught from a cross-disciplinary perspective by the current Oskar Schindler Humanities Foundation Endowed Professor. Topics will vary and can include, but are not limited to, relevant humanities, humanitarianism and humanitarian intervention, altruism, empathy, good corporate citizenship, and scientific contributions to solving problems in the human condition. The course emphasis is determined by the current Oskar Schindler Endowed Professor each term. 3 credits.

UNIV 695 Oscar Schindler Humanities Independent Study

Prerequisite: Consent of Oskar Schindler Endowed Professor. An opportunity for the student, under the direction of the Schindler Professor, to explore and acquire competence in a special area of interest related to the purposes of the Oskar Schindler Humanities Foundation Endowed Professorship, through a directed Independent learning experience. The topic and format are to be agreed upon by the student and the Schindler Professor. 1–3 credits.

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B.A., M.A., University of Madras, India; M.A., Ph.D., University of Wisconsin

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B.A., Wesleyan University; M.B.A., University of Chicago; D.B.A., Harvard University

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B.S., University of Pennsylvania; M.B.A., New York University; C.P.A.

Desio, Peter J., Professor Emeritus, Chemistry
B.S., Boston College; Ph.D., University of New Hampshire

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B.E.E., Cornell University; M.S., Stevens Institute of Technology; D.P.S., Pace University

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B.S., University of New Hampshire; M.S., Columbia University; R.D., Medical College of Virginia

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University *of* New Haven — Building Numbers, Names and Departments

1 **Maxcy Hall** – Office, College of Arts and Sciences, College of Business, Financial Aid
2 **Bayer Hall** – Undergraduate Admissions
3 **Gate House** – Graduate Admissions
4 **South Campus Hall** – Graduate & Undergraduate Registrar's Offices, Henry C. Lee College of Criminal Justice and Forensic Science
5 **Harugari Hall** – Classrooms, South Campus
6 **Marvin K. Peterson Library**
7 **Campus Bookstore, Campus Police**
8 **Bartels Hall** – Campus Center, Dining Hall
9 **Tagliatela College of Engineering** – Buckman Hall
10 **Dodds Hall** – Dodds Theater, Classrooms, Henry C. Lee Institute of Forensic Science
11 **Kaplan Hall** – Classrooms, Career Services, Center for Experiential Education
12 **Echlin Hall** – Information Services, Campus Card Office, University College, Fire Science, ELS
13 **New Hall** – Purchasing, Business Office, Public Affairs, Alumni Relations and University Advancement, Residence Hall, Dining Hall, Human Resources
14 **Subway Building** – University Publications, Marketing and Web
15 **Dental Center**
16 **Athletic Offices** – North Campus
17 **Charger Gymnasium** – North Campus
18 **Psychology Building**
19 **Sheffield Hall** – Health Services, Disability Services and Resources, Counseling Center, Residence Hall
20 **Bixler Hall** – Office of Residential Life, Residence Hall
21 **Bethel Hall** – Residence Hall
22 **Botwinik Hall** – Residence Hall
23 **Dunham Hall** – Residence Hall
24 **Winchester Hall** – Residence Hall, Facilities
25 **Ruden Street Apartments** – Residence Apartments
26 **Forest Hills Apartments** – Residence Apartments
27 **David A. Beckerman Recreational Center**
28 **Arbeiter Maenner Chor** – German Club
29 **New Haven Symphony Orchestra** – Administrative Offices
30 **Soundview Hall** – Residence Hall
31 Future Site – Henry C. Lee institute (Opening Fall 2010)

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RESPONSIBILITY	*I will assume responsibility for my words, actions and inaction.*
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UNDERSTANDING	*I will strive to appreciate, respect and learn from others whose experiences and opinions are different from mine.*
INTEGRITY	*I will conduct my academic and personal life with integrity.*
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