UNIVERSITY OF
NEW HAVEN

GRADUATE SCHOOL

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UNIVERSITY OF NEW HAVEN

Graduate School

300 Boston Post Road
West Haven, CT 06516

Catalog 2005-2007

MAIN NUMBER:
(203)932-7000 *or* 1-800-DIAL-UNH

GRADUATE ADMISSIONS:
(203)932-7133, press 5 *or*
1-800-DIAL-UNH, ext. 7133, press 5
Email: gradinfo@newhaven.edu
Fax: (203)932-7137

FINANCIAL AID:
(203)932-7315 *or* 1-800-DIAL-UNH, ext. 7315
Fax: (203)931-6050
Email: finaid@newhaven.edu

HEALTH SERVICES:
(203)932-7079 *or* 1-800-DIAL-UNH, ext. 7079
Fax: (203)931-6090
Disability Services (Voice/TDD): (203)932-7331

WEBSITE: www.newhaven.edu

UNIVERSITY OF
NEW HAVEN

This catalog supersedes all previous bulletins, catalogs, and brochures published by the Graduate School and describes academic programs to be offered beginning in Fall 2005. Graduate students admitted to the university for the Fall of 2005 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 which 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 non-immigrant 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) 932-7199. Persons who have special needs requiring accommodation should notify the university's Disabilities Services and Resources Office at Voice/TDD number (203) 932-7331.

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. Information changes that may be made subsequent to the date of publication may 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, professionally, and educationally. Our hope, and our mission, is that this journey will help you achieve a more meaningful career, the benefits of life-long learning, and the 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. The overwhelming majority of our faculty hold doctoral or terminal degrees in their respective fields, and in many cases they 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 trying to improve and enrich the educational experience of our graduate students in many ways.

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 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. Please come to see me if there is ever anything I can do to assist you.

Sincerely,

Steven H. Kaplan,
President


Phillip S. Kaplan Hall

GRADUATE SCHOOL PROGRAMS

Master's Degree Programs

Business Administration, MBA
Cellular & Molecular Biology, MS
Community Psychology, MA
Computer Science, MS
Criminal Justice, MS
Education, MS
  Teacher Certification
  Professional Education
Electrical Engineering, MS
Emerging Leaders, MBA
Environmental Engineering, MS
Environmental Science, MS
Executive Engineering Management, MS
Executive Program, MBA
Executive Tourism & Hospitality Management, MS
Fire Science, MS
Forensic Science, MS
Health Care Administration, MS
Human Nutrition, MS
Industrial Engineering, MSIE
  also MBA/MSIE, dual degree
Industrial Hygiene, MS
Industrial/Organizational Psychology, MA
Labor Relations, MS
Management of Sports Industries, MS
Mechanical Engineering, MSME
National Security & Public Safety, MS
Occupational Safety & Health Management, MS
Operations Research, MS
Public Administration, MPA
  also MBA/MPA, dual degree
Taxation, MS

Graduate Certificates

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

CALENDAR 2005-2007

Summer Term 2005 **Wednesday, July 6 - Thursday, Aug. 18**

Awarding of Degrees, Saturday, Aug. 27

Fall Term 2005 **Monday, Sept. 12 - Saturday, Dec. 17**

Last day to petition for January graduation, Monday, Oct. 17

Thanksgiving recess, no classes,
Monday, Nov. 21 - Saturday, Nov. 26

Winter Term 2006 **Tuesday, Jan. 3 - Monday, April 3**

Commencement, 2 p.m., Saturday, Jan. 14

Last day to petition for May graduation, Wednesday, March 1

Spring Term 2006 **Wednesday, April 5 - Tuesday, July 4***

*No classes, Friday, April 14
(A make-up class will be scheduled.)

Commencement, 10 a.m., Saturday, May 27

Memorial Day, no classes, Monday, May 29
(A make-up class will be scheduled.)

Spring Term 2006 **Wednesday, April 5 - Tuesday, July 4***

Last day to petition for awarding of degrees in August, Thursday, June 15
*No classes, Tuesday July 4th
(Make-up classes will be scheduled prior to the holiday.)

Summer Term 2006 **Thursday, July 6 - Friday, Aug. 18**

Awarding of Degrees, Saturday, Aug. 26

Fall Term 2006 **Monday, Sept. 11 - Saturday, Dec. 16**

Last day to petition for January graduation, Monday, Oct. 16

Thanksgiving recess, no classes,
Monday, Nov. 20 - Saturday, Nov. 25

Winter Term 2007 **Tuesday, Jan 2 - Monday, April 2**

Commencement, 2 p.m., Saturday, Jan. 13

Spring Term 2007 **Wednesday, April 4 - Tuesday, July 3**

No classes, April 6
(A make-up class will be scheduled.)

Commencement, 10 a.m., Saturday, May 19

Memorial Day, no classes, Monday, May 28
(A make-up class will be scheduled.)

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

Summer Term 2007 **Monday, July 9 - Tuesday, Aug. 21**

Awarding of Degrees, Saturday, Aug. 25

This calendar is under review by the Faculty Senate and may be subject to change.

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THE UNIVERSITY

The University of New Haven is a private, independent, comprehensive university based in southern New England, specializing in 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.

The Mission of UNH
To develop career-ready and cultivated graduates, well-prepared for meaningful roles and the pursuit of lifelong learning in a global economy and society.

The Vision of UNH
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.

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

UNH takes pride in its commitment to service, quality, integrity, and personal caring. All our 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 will embody 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.

Values

- Belief in and practice of our Mission and Vision
- Commitment to the success of our students through caring and responsive service
- Teamwork: helping each other succeed
- Open communications: trusting, honest, and straightforward
- Commitment to thoughtful action
- Thinking, articulating, doing, and evaluating
- Leading by example with continuous improvement
- Facing all issues, and being accountable; being prepared and avoiding surprises
- Respecting 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 skills and knowledge for already-chosen careers in highly technical and competitive fields. Other students studying at the graduate level are preparing to enter new careers. Most graduate programs offer multiple areas of specialization; flexibility in elective choices; opportunities for field work, internships, independent study, and research; and the possibility of cooperative education work experience as part of the curriculum.

The university's faculty is outstanding in its combination of highly qualified, full-time academics (nearly 90 percent of whom hold doctoral or terminal degrees in their field from a broad spectrum of prestigious institutions) and part-time faculty members employed in area businesses and professions who bring, in addition to academic qualifications, practical insight and experience to the classroom.

The Graduate School offers more than 25 master's degree programs plus more than 30 graduate certificates. Classes are offered at locations across Connecticut.

The main campus in West Haven offers all academic programs. 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 MBA for Emerging Leaders, the Master of Science in Computer Science, and the Executive Master of Science in Engineering Management (EMSEM). The Master of Science in Education is offered at the main campus and at off-campus locations in New London and Newington.

In addition to the graduate programs at the main campus in West Haven, the university offers the Master of Science in Forensic Science with a concentration in advanced investigation at its California campus in Sacramento and is also authorized to offer the Master of Science in National Security and Public Safety at our UNH-Sandia campus in Livermore, California. The graduate National Security program is offered in Arlington, Virginia, at our Crystal City campus, and also in New Mexico at the Sandia National Laboratory site on Kirkland Air Force Base. Graduate certificates in forensic science advanced investigation, information protection and security, and forensic computer investigation are also available at the Sacramento site. The university offers its MA in Industrial/Organizational Psychology program in Athens, Greece. Most 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 graduate 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 postgraduate 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 which 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.

Institutional integrity is also addressed through accreditation. NEASC accreditation is not partial but applies to the institution as a whole. As such, it is not a guarantee of the quality of every course or program offered or of the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students.

Engineering

The bachelor of science degree programs in chemical, civil, electrical, industrial, 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 students' primary advocate in matters of consumer protection. This authorization applies to the university's master of science program in forensic science with a concentration in advanced investigation and to graduate certificates in forensic computer investigation and in information protection and security, offered at the UNH California campus in Sacramento. Authorization for our master of science degree in national security and public safety at our UNH-Sandia campus in Livermore and the master of science in fire science offered at Riverside is also granted through the Bureau for Private Postsecondary and Vocational Education.

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.

Virginia Programs

The State Council of Higher Education for Virginia (SCHEV) has certified the University of New Haven to operate in the Commonwealth of Virginia and has granted authorization for the university to offer graduate programs in National Security and Public Safety and in National Security with a concentration in Information Protection and Security, as well as a graduate certificate in National Security.

Other Memberships

The university holds memberships in the Council of Graduate Schools, the Northeastern Association of Graduate Schools, the

Accreditation Board for Engineering and Technology, the National Association of Schools of Public Affairs and Administration , the National Association of Boards of Examiners for Nursing Home Administration, the American Council on Education, the Association of American Colleges, the National Association of Independent Colleges and Universities, the College Entrance Examination Board, and other regional and national professional organizations.

History

The University of New Haven was founded in 1920 as the New Haven YMCA Junior College, a branch of Northeastern University. It became New Haven College in 1926 by an act of the Connecticut General Assembly. The college moved to its current location in 1960.

In 1969, New Haven College added the Graduate School to its established baccalaureate programs. Initially offering programs in business administration and industrial engineering, the Graduate School expanded rapidly. Today, more than 25 master's level programs and additional courses have a graduate enrollment of more than 1800 students.

In 1970, on its fiftieth anniversary, New Haven College became the University of New Haven, reflecting the increased scope and the diversity of academic programs offered.

Today the university offers more than 100 graduate and undergraduate degree programs in six schools: the Graduate School, the College of Arts and Sciences, the School of Business, the Tagliatela School of Engineering, the School of Hospitality and Tourism, and the School of Public Safety and Professional Studies.

The University's Academic Schools

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

The College of Arts and Sciences

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, two options are available: master of science degrees in teacher certification and in professional education. The human nutrition program is offered part-time, one weekend per month, at the main campus. 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 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, music and sound recording to psychology. 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 coursework as undergraduates and enables them to earn a bachelor's degree, master's degree, and Connecticut certification in five years. Detailed information can be found in the *Undergraduate Catalog*.

The School of Business

The mission of the School of Business is to provide quality, career-oriented education to students with varied backgrounds and experiences. The school 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 school to be the regional leader in providing career-oriented, contemporary business education.

As the business environment becomes more complex, the School of Business provides contemporary educational experiences of high quality in order to make students ready to face the challenges of a dynamic world and to meet their responsibilities within a global society. To meet this goal, career-oriented programs are provided, employing current knowledge and techniques presented in a manner appropriate to the diverse backgrounds and experiences of graduate students with a variety of concentrations.

Through the Graduate School, the School of Business offers an MBA 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 (MPA) two dual degrees, MBA/MPA and MBA/MS industrial engineering, are also available. The school 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 School of Business offers associate and bachelor's degree programs in the departments of accounting, communication, economics and finance, marketing and international business, and management. Detailed information can be found in the *Undergraduate Catalog.*

The Tagliatela School 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 School is to prepare individuals for professional practice in diverse engineering areas, computer science, and chemistry. In addition, the School 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, executive engineering management (EMSEM), industrial engineering, mechanical engineering, and operations research. A dual degree program combines the MBA with the MS industrial engineering degree. Graduate certificates are offered in civil engineering design, computer applications, computer programming, computing, logistics, and quality engineering.

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

The School of Hospitality and Tourism

An executive master of science degree in tourism and hospitality management is offered through the Graduate School by the School of Hospitality and Tourism. The graduate curriculum is designed for those who have significant managerial or operational experience in the tourism/hospitality industry. The goal of the program is to provide an avenue for students with industry experience to further their education at the graduate level.

Undergraduate degree programs are offered in hotel and restaurant management and in tourism and hospitality administration. Information on undergraduate study is contained in the *Undergraduate Catalog.*

The School of Public Safety and Professional Studies

Through the Graduate School, the School of Public Safety and Professional Studies offers career-oriented graduate degree programs in criminal justice, fire science, forensic science (including the criminalistics laboratory program), industrial hygiene, national security and public safety, and occupational safety and health management. A wide range of graduate certificates is also available in the same fields and in forensic computer investigation and in 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 in 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 all the same fields, plus legal studies. Information on undergraduate programs appears in the *Undergraduate Catalog.*

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, and train service as well as local airports.

New Haven, just ten minutes away from the campus, is a city where arts and cultural activities flourish and coexist with 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 the "Gateway to New England."

New Haven is home to the Shubert, Long Wharf, and Yale Repertory theatres; 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 buildings that house modern laboratory and library facilities, the latest computer equipment, an athletic complex, and residential halls.

The Main Campus includes administration and classroom facilities in Ellis C. Maxcy Hall (the main administration building); Bayer Hall (undergraduate admissions and financial aid); the Phillip Kaplan Hall; the Jacob F. Buckman Hall of Engineering and Applied Science; Echlin Hall (which houses 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 center; the Psychology Building;

Robert B. Dodds Hall (with classrooms, offices, laboratories, a theatre, and art gallery); the Campus Store; residence halls; and the Gate House.

The South Campus includes Harugari Hall, which houses the School of Hospitality and Tourism, and South Campus Hall, where students will find the School of Public Safety and Professional Studies and other departments including the Education Department. The university's athletic fields and Charger Gymnasium are located at the North Campus.

The Alliance Theatre is in residence at UNH and produces a variety of dramatic and musical productions, including children's theatre. The campus has a newly renovated Seton Art Gallery where the work of renowned local and national artists is featured, along with gallery space devoted to the university's art department.

Admission

General Requirements

Applicants to the University of New Haven Graduate School are required to hold a baccalaureate degree from an accredited institution. 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 will not be permitted until a final, official transcript is submitted to the Graduate Admissions Office.

Students may submit scores from the Graduate Record Examination (GRE), PRAXIS, or the Miller Analogies Test in support of their applications. Students applying to certain programs will be 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.

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 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.

Procedure

An applicant for admission to the Graduate School must submit the university graduate school application form, required letters of recommendation, complete 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). All application materials become property of the University of New Haven. An application form is located at the back of this catalog and online at www.newhaven.edu.

In addition to the above application materials, all students must submit a completed measles/rubella immunization form to the Health Services Office. All full-time students are also required to submit the Health Examination Report.

In most cases, full-time and part-time do-

mestic 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, the acceptance will remain open for one calendar year. After one year, a new application for admission may be required.

Students accepted into a program will be 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 will be 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 (non-matriculant), 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

An applicant may be accepted provisionally when his or her undergraduate grade point average falls below the standard set for full acceptance, when acceptance requires additional test or document submission to support entrance into the program selected, or when the undergraduate background indicates a need for additional coursework 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 the provisional acceptance at the beginning of the program of study. Upon completion of these requirements, each student's record will be evaluated for admission as a fully matriculated candidate for the degree.

Special (Non-matriculated)

Special student 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 credit hours 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. 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.

An alumni audit program provides UNH degree-holding alumni/ae with a low-cost method of upgrading information and skills obtained in the process of completing their degrees at the University of New Haven. This program is not intended for the development of new skills or for the learning of new or more advanced topics. Therefore, the courses available (space permitting) to alumni auditors are limited to those at or below the level of the UNH degree obtained by the student.

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.

Because the review of international applications takes considerable time, it is important that the application and all supporting materials be received by the Graduate Admissions Office prior to the deadline dates 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 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 generally 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 all of the steps outlined in the following section.

International Application Process

All applicants must submit the following application 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 all 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 score of 190 (520 on the paper-based test) or above. 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 5.5 is also acceptable. IELTS is jointly managed by the British Council, IDP:IELTS Australia, and the University of Cambridge ESOL Examinations.
   b. Proof of completion of Level 112 in an ELS Language Center program.
   c. Proof that undergraduate academic instruction and courses were completed using the English language.

   Students whose TOEFL scores are less than 220 (560 on the paper-based test) and/or students who enter the Graduate School following completion of an intensive English language training program may be required to take and pass E 600 English Language Workshop in the first term of enrollment at the Graduate School.
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 form and supporting documents.
   b. Current official scholarship letter. *The University of New Haven does not offer need-based financial assistance to international students.*
6. Acceptance fee of $225. 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) will be issued. This fee is not credited toward tuition and is not required in advance from scholarship students.
7. Medical Forms. All 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 all full-time students).

Appropriate documents (Form I-20 or Form DS-2019) will be issued only after a student has submitted all required materials, been accepted into a program of study, provided acceptable proof of English proficiency and financial status, and paid the $225 acceptance fee.

The international student acceptance fee is required of all international undergraduate and graduate students at the university. This fee directly and indirectly supports a variety of services and programs for international students, including orientation programs, cross-cultural workshops, local community activities, international alumni programs, subscriptions to international newspapers/magazines for the campus library, and operation of the International Services Office.

Initial Attendance at the University

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

At the time of registration, students will be required to pay the tuition and fees for one trimester.

International students must subscribe to the university's international student health insurance. The premium of $685 per year will be charged to all international students. Requests for information regarding coverage and/or premiums for dependents should be directed to the Health Services department.

Registration

Registration deadlines are listed in the course schedules published for each term. Returning students and new domestic students who have been admitted to programs will receive registration materials and can register by email, fax, mail, phone, or in person.

Domestic students who have not completed the application process and/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 will be required at the time of registration; and, whenever possible, transcripts of previous coursework 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 see to it 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 will not be permitted to 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 con-

secutive terms will no longer receive registration materials. It will be 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 will be 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 written permission of the instructor. Course additions may be handled in person or by email, fax, or mail.

A student may not withdraw from a course any time after the seventh scheduled class meeting without permission of the instructor. Course withdrawals may be handled in person or by email, fax, or mail.

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 full tuition to the students.

Students with an outstanding balance will not be permitted to register. Current students who register after the registration deadline will be assessed a late-registration fee.

ACADEMIC POLICIES

Academic Honesty and Ethics

The policies of the University of New Haven require commitment to academic honesty and ethics. Violations of university standards for academic honesty (including plagiarism), whether in fact or in spirit, will usually be handled by the faculty member involved. However, if sufficient reason is found, violation may be grounds for dismissal from the Graduate School.

Students are expected to complete all course requirements on their own initiative, with no collaboration unless specifically authorized by the instructor. In addition, use of the work, ideas, or knowledge of another person, publisher, company, government, or organization must be properly identified by reference or note in all materials submitted by the student.

Students wishing to appeal the decision of a faculty member regarding academic honesty and ethics should contact the Graduate Dean's Office for information.

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, registration forms, grade lists, 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 all examinations as scheduled. 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 faculty member involved and to meet the professor's requirements for making up work missed, if the professor allows missed 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

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+ = 4.30 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

P = Zero quality points
Pass; carries credit hours toward the degree. Use limited to thesis, Executive MBA, and EMSEM courses.

P+ = Zero quality points
Pass with distinction; carries credit hours toward the degree. Use limited to Executive MBA, and EMSEM courses.

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

U = Zero quality points
Unsatisfactory performance in a noncredit course

W = Zero quality points
Withdrawal from a course

I = Zero quality points
Incomplete; see rules below regarding incomplete courses.

T = Zero quality points
Used for thesis students who have not completed work during the term in which they originally registered for the course. Students must complete the work within the time limit for completion of the degree.

AU = Zero quality points
Audit; indicates that a student registered for and attended a class but received no credit toward any degree.

Any grade change from one letter to another must be approved by the Committee on Instruction.

Some employers require that a letter grade (A+ through C-, or F) be awarded if a student is to receive tuition reimbursement. It is the student's responsibility, in a noncredit course, to inform the faculty member of the need for a letter grade.

Executive MBA and EMSEM students who are in need of a letter grade for tuition reimbursement must inform the faculty member of the need for a letter grade, and the Dean's Office will prepare a letter for this purpose.

Grade Reports

Reports of the final grade in each subject will be mailed to the student from the Graduate Records Office soon after the close of each term, providing all financial obligations have been met.

Incomplete Coursework

A grade of Incomplete (I) is given only in special circumstances and indicates that the student has been given permission by the instructor to complete the work for the course with the same instructor after the end of the trimester or term. If a student is required to attend the 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 I (Incomplete) should complete the work within three months after the end of the term in most cases. Master's-level students may have a time period specified by the instructor, and not to exceed one year, to complete the work required for the course and have a grade submitted to the Registrar/Graduate Records.

Any exception to the one-year time limit must be approved by the Committee on Instruction.

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. The quality point values are shown in the above section describing the grading system.

The quality point ratio is obtained by multiplying the quality point value of each grade by the number of credit hours assigned to each course as listed in the catalog, then dividing the sum of the quality points earned by the number of credit hours attempted in courses for which a grade of A+ through C- or F is awarded.

A cumulative quality point ratio is obtained by calculating the quality point ratio for all courses taken at the University of New Haven which are part of the degree program.

Academic Probation

Any graduate student whose cumulative quality point ratio (QPR) is below 3.00 (a "B" average) will be on academic probation, will receive a probation letter, and may be required to obtain permission from the program coordinator before registering for additional coursework. Graduate students who are on academic probation will fall within one of the following categories:

Dismissal:

A student whose cumulative QPR is below 2.70 after completion of 18 credits will receive a letter of dismissal and will be required to withdraw from the Graduate School. Appeals concerning required withdrawal under these circumstances should be directed to the Dean of Graduate Studies.

Probation & Possible Dismissal:

A student whose cumulative QPR is below 2.00 at any time will receive a letter of probation and will be required to meet with the Dean of Graduate Studies, who will review the academic situation with the student's program coordinator. If the Dean of Graduate Studies and the coordinator agree that the student may be permitted to continue study, documentation of specific instructions mandated for continuation will be placed in the student's academic file.

Probation & Registration Held:

A student who has earned 12 credits and whose cumulative QPR is below 2.80 will receive a letter of probation, and the student's registration packet for the upcoming term will be withheld pending consultation with the program coordinator. The registration for the upcoming term may be released by the program coordinator after a conference with the student.

Warning:

All students whose cumulative QPRs are below 3.00, other than those in the above categories, will receive a warning letter and should seek advice from their program coordinators regarding their academic progress.

Repetition of Work

A student may repeat a course. The grade received in the second attempt will supersede the original grade in the computation of the quality point ratio (QPR) if the second grade is higher. Both grades remain on the transcript. The course may be used only once for credit toward the requirements for completion of the degree program.

Awarding of Degrees

The university awards degrees three times a year, at commencement ceremonies in January and in May and without formal ceremony in August. 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. All students must file a graduation petition form in order to have their names placed on the list of potential graduates.

A cumulative quality point ratio of 3.30 in doctoral coursework and satisfactory completion of the written and oral doctoral comprehensive examinations, followed by successful completion and defense of the doctoral dissertation, are required for graduation and the conferring of the doctoral degree. All doctoral candidates must also file a graduation petition form in order to have their names placed on the list of potential graduates.

Students completing their degree requirements at the end of the fall term will receive their degrees in January. Students completing their degree requirements at the end of the winter term will receive their degrees in May. Students completing the requirements for their degrees at the end of the spring term or the summer session may be awarded their degrees at the end of August and may request permission from the Registrar to participate in the formal graduation ceremonies at the following January commencement.

Petition for Graduation

Candidates for the January commencement must file a graduation petition with the Graduate Records Office no later than October 15. Candidates for the 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 BS/MS program in Environmental Science, the MBA/MPA dual-degree program, or the MBA/MSIE dual-degree program must fill out two graduation petition forms (one for each degree). However, they will pay the full graduation petition rate of $110 only for the first degree, plus a reduced rate of $75 for the second degree, to be awarded at the same commencement date.

Graduation petition forms are available in the Graduate Records Office. Payment of the graduation fee must accompany the petition.

A candidate who does not complete all the requirements for graduation before the deadline, after having filed the petition to graduate and paid the fee, will have to petition again at a later date. At that time, only the refiling fee will be charged.

All financial obligations to the university must be met prior to graduation.

Time Limit for Completion of Degree

A student must complete all 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 Dean of Graduate Studies.

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

Students enrolled in the doctoral program must complete all coursework, pass the doctoral comprehensive examinations, and successfully complete and defend the doctoral dissertation within eight years of the date of completion of the first doctoral course.

Residency Requirements

Degree programs have a 30-graduate-credit residency requirement, with the exception of the MBA/MSIE and MBA/MPA dual degree programs, which have a 60-graduate-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, completion of a minimum of an additional 30-graduate-credit residency requirement is necessary 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 master's level is defined as enrollment for nine credit hours in the current term. Required noncredit courses (e.g., E 600) count toward full-time study. Under certain circumstances the program coordinator and the Graduate School administration may approve a reduction in credits.

For international students who are required to maintain full-time enrollment for their immigration status, full-time doctoral study may be continued as long as their dissertation advisor, department chair, and/or director of the doctoral program certify that the student is maintaining continuing registration and making satisfactory progress toward completion of the comprehensive written/oral examinations and/or dissertation required for the doctoral degree.

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.

In general, full-time enrollment is available in all master's degree programs *except the mechanical engineering and human nutrition master's degrees and the graduate certificates.* In special cases, however, full-time registration may be available in the human nutrition program.

It is important to note that all graduate programs may also be pursued on a part-time basis.

Part-Time Study

Part-time study at the master's level is defined as registration for fewer than nine credit hours in the current term. Half-time study at the master's level is defined as registration for a minimum of five credit hours in the current term. Registration for fewer than five credit hours qualifies as less than half-time study.

The certificates have limited scheduled offerings and, therefore, are generally pursued on a part-time basis.

International students with F-1 or J-1 immigration status may not enroll in study leading to the MS in mechanical engineering or only to a certificate; these are part-time study plans.

Transfer Credit

Transfer credit may be given for applicable graduate courses taken at other regionally accredited institutions (or ones recognized as

such by the university) prior to matriculation at the University of New Haven, subject to the following conditions:

- the courses were at the graduate level,
- each grade was **B-** or better, and
- the course did not fulfill requirements for any other degree already earned by the student.

Coordinated Courses

Graduate students currently matriculated at the university must secure written approval before taking courses at another institution if they plan to transfer credits into their UNH programs. Course coordination forms are available in the Graduate Records Office for this purpose.

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 will be awarded. Transfer credits and coordinated course credits are not included in courses used to establish a student's QPR or residency requirement at the University of New Haven.

Waiver of Courses

Some programs permit waivers of core courses on the basis of undergraduate or graduate courses taken at accredited institutions. Waivers of elective courses and/or concentration courses are not permitted, nor are waivers based on experience. In such cases, substitution of a more advanced course may be allowed.

For a course to be waived, a student must first secure the written approval of the program coordinator, the department chair, or a faculty member acting for the chair in the department in which the waiver is requested. Waiver requests should be submitted in writing to the program coordinator.

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, refunds will not be granted for courses taken and subsequently waived.

Crediting Examinations

Under certain circumstances, students who have independent knowledge of 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; or have completed the equivalent work in noncredit training courses; or have had extensive, related, on-the-job experience.

Crediting examinations are subject to the following conditions:

- no letter grade is recorded other than P,
- the crediting examination is for required courses only (not concentration courses or electives),
- the credits awarded by examination do not count toward the residency requirement, and
- 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, the chair of the department in which the course is offered, and the Dean of Graduate Studies. Crediting Examination Permission Forms are available from the Graduate Records Office.

Once permission has been granted and the crediting examination fee of $300 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 the prerequisites.*

Dropping/Adding a Class

A student who wishes to make a change in a class must refer to the instructions in the

printed schedule. These are available from the Graduate Records Office. Written 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 are required to take comprehensive examinations in order to complete their degree programs must obtain the appropriate comprehensive examination approval form(s) from the Student Records Office, secure the necessary approvals, and pay the required fees, if applicable. Students should confirm arrangements for comprehensive examinations with the program coordinator.

Research Projects, Independent Study, and Internships

All academic programs leading to a degree require the completion of a thesis, a research or other special project, internship, or comprehensive examination. Students must have the written approval of the advisor, department chair, and program coordinator prior to enrolling for project or internship credit on an individual basis. The required approvals must be on the appropriate forms.

The Graduate School's permission form for registration for research project, internship, or independent study is printed in each of the graduate trimester schedule booklets and is also available at Graduate Records.

Students preparing a research project or independent study/internship report may be asked to follow the guidelines presented in the UNH *Dissertation & Thesis Manual* (2nd edition, 1998), copies of which are on reserve at the library.

In addition to the project requirement described above, students may (in certain cases) enroll for independent study/internship under the supervision of a faculty advisor. *A student may not register for more than a total of 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.

Thesis

Preparation and completion of a thesis are optional for master's degree programs. A number of preliminary steps are required before registration for thesis will be accepted by the Registrar. The student completes the Proposal for Thesis form (available at the Graduate Records Office), in which the proposed subject, the methodology, and the hypotheses are described. The student secures the approval signature of a faculty member who will serve as advisor. The student must also secure approval of the proposed thesis and thesis advisor from the department chair and/or program coordinator and the Dean of Graduate Studies. Only after the Registrar has received the approved form will the student be 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 Dean of Graduate Studies. A date and time will then be scheduled by the thesis advisor for the thesis defense before the student's thesis committee and the Dean of Graduate Studies or his/her 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 and the approval of the thesis by the Dean of Graduate Studies, thesis credit is awarded, and final, unbound copies of the thesis are deposited with the Dean of Graduate Studies to be for-

warded 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 & Thesis Manual* (2nd edition, 1998), copies of which are available in the Graduate Records Office. Questions not resolved by the instructions should be settled in consultation with the advisor and by reference to a standard style manual.

The University of New Haven Graduate School participates in the University Microfilms, Inc. (UMI) Dissertation Services program and provides assistance to doctoral students for registration of dissertations and copyrights.

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 yet be ready to commit themselves 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, submit official transcripts showing completion of the 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 in 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. Two different types of certificates are awarded:

- **Professional Certificate—**awarded to students who held an undergraduate/baccalaureate degree at the time they began study for the certificate.
- **Senior Professional Certificate—**awarded to students who already held a graduate/advanced degree at the time they began study for the certificate.

A petition form requesting certification must be submitted to the Graduate Records Office following payment of the certificate petition fee. Also, 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 coursework is reviewed by the certificate advisor and the graduate registrar; and, if the work is found to be complete and satisfactory, the appropriate certificate will be mailed to the student. A minimum QPR of 3.00 is required as satisfactory performance in courses taken at the university to qualify for the awarding of a graduate certificate.

All additions, deletions, and/or revisions of graduate certificates are subject to review by the Graduate Committee, elected faculty members who serve as the curriculum and academic policy committee for the Graduate School.

Certificate Requirements:

Required coursework usually consists of 12 to 20 credits of graduate study, depending on the subject area selected. Students should contact the faculty advisor for the selected certificate for assistance in planning the course of study.

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 all course prerequisite requirements. Credits for courses taken as prerequisites for certificate courses must be taken outside/in addition to the certificate requirements.

Academic Advising

It is the student's responsibility to select courses in accordance with prerequisites, the advisor's recommendations, the departmental plan of study (if required), and the requirements for the degree.

Students needing further explanation about program requirements or course sequencing should request academic advisement. Appointments for academic counseling should be scheduled through concentration advisors or program coordinators. Advisement sessions are held prior to each trimester.

A student is not required to file a formal plan of study with the Graduate School. It is the student's responsibility to meet the stated requirements for the degree.

Grievance Procedure

A formal policy for the handling of student grievances is available in the office of the university ombudsman.

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 consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent. One exception which permits disclosure without consent is disclosure to school officials with legitimate educational interests. A school official is a person employed by the university in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the university has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Governors; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in per-

forming his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.

(4) The right to file a complaint with the U.S. Department of Education concerning alleged failures by the University of New Haven to comply with the requirements of FERPA. The name and address of the office that administers FERPA are: Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue SW, Washington, DC 20202-4605.

Diversity Policy

The University of New Haven is committed to achieving a diverse and pluralistic community which 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

In accordance with federal law concerning a drug-free campus environment, relevant university policy and regulations are provided for all current 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 all UNH faculty, staff, students, and guests, the University of New Haven has adopted a SMOKE-FREE Policy.

NO SMOKING will be allowed in any campus administrative, academic, or recreational building. This restriction will apply to all UNH offices, classrooms, hallways, stairwells, restrooms, dining facilities, conference/meeting facilities, athletic facilities, and any other public spaces within these buildings.

Effective January 1, 2003, smoking will be limited to areas which are 20 feet away from all entrances to university buildings. Signs will be placed on the entrances to inform everyone of the policy, and ash receptacles will be place 20 feet away from all entrances. This is not meant to be punitive to those who smoke but only to allow everyone to enter our buildings without breathing in unwanted smoke. It will be 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 the residence halls will be restricted to rooms, suites, and apartments that have been designated as allowing smoking as agreed upon by the roommates. Smoking will not be 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:

Student Affairs Office:	932-7199
Human Resources Dept.:	932-7240

This policy will apply to all UNH facilities in West Haven and Southeastern operations, as well as 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's 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 all current students and employees, and make the data available to all prospective students and employees upon request.

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

Policy on Cell Phones and Beepers

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

TUITION, FEES, AND FINANCIAL AID

Following are the tuition, fees, and charges which will be in effect for the fall 2005 term. The university reserves the right, at any time, to make whatever changes may be deemed 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

Tuition, per credit hour $545
Tuition, per 3-credit course.....$1,635
Executive MBA,
complete program $44,000
Executive MS in Engineering Management,
complete program $37,000
MBA Cohort, complete program $34,000
MS Computer Science Cohort.....$32,760
MS Labor Relations Cohort $20,000
MS Taxation Cohort $20,000
Auditor, per course $1,635
E 600, English Language Workshop $1,425

Master's Nonrefundable Fees

Application fee.....$50
Executive MBA application fee.....$50
Auditor application fee $50
Auditor course fee for
UNH alumni/ae, per course $400
Continuing registration fee $100
Co-op registration fee, full-time $150
part-time.....$75
Graduate Student Council fee, per term....$15
Graduation petition fee.....$110
Late filing fee, after March 1 (May),
June 15 (August), Oct. 15 (January).....$50
Graduation refiling fee $50
Petition fee for two/dual degrees $185
Health insurance fee (per year, all
full-time domestic students).....$200
International student acceptance fee $225
International student health insurance
premium (per year) $685
Laboratory fees $60-310
Late payment fee
(after scheduled due date)*.....$25
Late registration fee, current students $15
Graduate certificate fee (payable upon
completion of courses) $35
Technology fee/per trimester $20
Transcript fee/per copy $5
Make-up examination fee $10
Comprehensive examination fee $300
Crediting examination fee $300

Doctoral Tuition and Nonrefundable Fees

Dissertation tuition, per course..... $1,160
Graduate Student Council fee,
per term $15
Continuing registration fee $710
Qualifying examination fee
(where applicable).....$300
Doctoral graduation petition fee.....$150
Dissertation copyright and filing fee $125

**A late fee plus 1 1/2 percent per month penalty will be assessed on outstanding balances.*

Technology Fee

The technology fee paid by all students will afford each student a personal copy of Microsoft Office, which can be used during study at UNH and retained upon graduation from the university. Other benefits of the fee include upgrades to computers in the library and campus laboratories and increased student technology support.

Payment

Tuition for graduate courses is due at registration. However, the university permits graduate students to pay tuition in two installments, one half with the registration form and the balance before the end of the first week of the term. All students who have not completed tuition payments by the end of the first week of the term will be assessed the late payment fee.

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 their own arrangements with their employers for reimbursement.

The university withholds the giving of grades, the awarding of diplomas, the issuance of transcripts, and the like to any student whose account is in arrears. The university accepts American Express, MasterCard, and VISA.

Withdrawal

A student may withdraw from a course up 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 "W" will be recorded on the student's transcript at the end of the term when grades are recorded.

To be eligible for a cancellation or refund of tuition charges, students must formally notify the Registrar of their intention to withdraw by completing the university withdrawal form and submitting it to the Registrar by mail or in person. The date of the postmark on the mailed withdrawal forms, or the date of submission on those brought in person, 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 MBA, EMSEM, the MBA 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 prior to the second, 60 percent prior to the third, 40 percent prior to the fourth, 20 percent prior to the fifth. No cancellation will be made after the fifth regularly scheduled class meeting. Any refund amount will be 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 will be 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 mod-

ule or less, half of the year's tuition will be 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, fellowships, and student loans. Application procedures for financial assistance are detailed below. Applications are available from the Financial Aid Office.

Financial aid award decisions are made after careful consideration of a student's application for assistance. Eligibility for financial aid is based on an applicant's 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 of aid applicants 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 enrolled on at least a half-time basis. Merit-based programs are open to all matriculated students.

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

- **Federal Stafford Loans—**The Federal Stafford Loans are need-based loans. Eligible students may borrow up to $8,500 per academic year. The interest rate for new borrowers is variable. The interest rate during in-school, grace and deferment periods is based on the 91-day T-Bill rate plus 1.70 percent and was 2.77 percent during the 2004-2005 academic year. The interest rate during all other periods is based on the 91-day T-Bill plus 2.30 percent and was 3.37percent during the 2004-2005 academic year. The interest rate is capped at 8.25 percent. The interest is federally subsidized. Repayment begins 6 months after graduation or withdrawal from the university. Exit interviews must be conducted prior to a student's graduation or withdrawal.

Non-Need-Based Programs
(open to 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.

Merit-Based Programs
(open to all 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 partial tuition support. Applications for assistant-

ships are made in early spring for the following year and may be obtained via the university website. Appointments are made for the academic year starting in September.

- **Fellowships—**Fellowships are competitive awards made to continuing students on the basis of outstanding academic achievement. Students who have earned at least 24 credits at UNH with the highest levels of academic performance in their chosen fields automatically become eligible for consideration. Recommendations for fellowships are also sought from the faculty. Students may nominate themselves by writing to the Dean of Graduate Studies. Awards are made by a faculty committee for the academic year starting in September. (No financial aid application is required.)

Alternative Financing Options

Alternative financing options are available to assist students with paying for their educational expenses. 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. More information regarding these loans and financing options is available in the Financial Aid Office.

Application Procedure

Students applying for need-based and non-need-based assistance must submit the documents listed below by the following deadlines:

May 1 for the Fall trimester/academic year
October 15 for the Winter trimester
January 15 for the Spring trimester

Note: *International students* who are applying for Graduate Assistantships need to complete only the UNH Non-Need-Based Financial Aid Application. This form is available from the Financial Aid Office.

- **University of New Haven Financial Aid Application—**This form must be completed fully and submitted to the University's Financial Aid Office. Students may access this form via the university website.
- **Free Application for Federal Student Aid (FAFSA)—**This form is required of those applying 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 paper applications are available at UNH or any college financial aid office.
- **Verification—**A student may be selected for a process called verification by submitting an aid application and completing the Free Application for Federal Aid. 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 from you as your 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 will be 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 the university to calculate the amount of unearned aid a student has received. The university must:

- 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% of the term are not subject to the federal calculation.

- Determine the amount of aid earned by the student. The university must calculate 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.
- Make a post-withdrawal disbursement if less aid has been disbursed than a student has earned. The university will notify the student in writing within 30 days of the withdrawal date that 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 SEOG
7) 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 will notify 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% of unearned grant.

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

- Repay in full
- Make arrangements to repay the university
- Make arrangements to repay the US Department of Education.

Students who fail to take positive action to repay their grants will be reported to the Department of Education and 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. All graduate students must maintain a minimum 3.0 cumulative quality point ratio (QPR) in order to be in good academic standing.

Cooperative Education

Cooperative education programs at the University of New Haven provide an opportunity for students to combine or alternate periods of career-oriented, temporary work assignments with their academic programs.

Co-op work assignments for graduate students are developed on an individual basis.

This enables students to integrate the experiential learning of the workplace with the theoretical work of the classroom.

Resume writing assistance and interviewing information are available in preparation for co-op program participation.

Co-op employers include large corporations, small businesses, government agencies, and nonprofit organizations.

Graduate students become eligible to participate in the co-op program after completion of nine credit hours of graduate study. Certain additional requirements must also be met for eligibility for cooperative education. Co-op work assignments may be full-time or part-time, and of varying duration. Co-op assignments carry no academic credit. Students who are interested in registering for Co-op should contact the Co-op Coordinator in the academic school which houses their program of study.

ACADEMIC AND STUDENT SERVICES

Academic Services

American Business Review

The university publishes a refereed journal, the *American Business Review*, which appears biannually.

Campus Copy, Inc.

Campus Copy is a full-service copy, type, and print shop located in the basement of Maxcy Hall on the main campus. Campus Copy offers a variety of services at reasonable prices, including resume composition, word processing, desktop publishing, photocopying, full-color copying, scanning, faxing, and binding. Campus Copy, Inc. is independently owned and operated. For more information, call (203) 931-9844.

Campus Store

The Campus Store provides all required texts, new and used, for courses at the university. Textbooks used during the trimester 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 related supplies, greeting cards, clothing and imprinted gifts, candy, and a selection of paperbacks, newspapers, and periodicals. It also handles orders for class rings and school chairs. Film processing service is also provided for the campus community.

Students taking classes at the Southeastern (New London) site may purchase their books at that location. The bookstore will ship books and other items to any home or business address. Special educational discounts on computer software are available at efollett.com to faculty and students who have a current UNH Campus Card. A computer software catalog is available; call (203) 933-4000. Students can also use flex cash on their campus card at the bookstore. The Internet access to the bookstore is http://shop.efollett.com/htmlroot/storhome/universityofnewhaven501.html.

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 offers conflict management services to individuals and to businesses, institutions, governmental agencies, and community organizations. 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 mission of the Center for Family Business, founded in 1994, is to strengthen family firms, the backbone of Connecticut's economy. The University of New Haven has as its business partners in this endeavor the accounting firm of Bailey, Schaefer and Errato, LLC, Sequence Financial/MassMutual, Gowrie, Brett & Young, US Trust Company, and the law firm of Wiggin and Dana.

The Center 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) offers free tutoring to students seeking extra help with their studies. The tutoring staff, over 25 instructors in all, is comprised largely of professionals who hold advanced degrees in their fields and who are committed to aiding the learning process. Tutoring is available six days a week throughout each trimester.

The CLR includes three labs. The Math Lab offers help with mathematics, science, and business courses; the Writing Lab offers help with all writing assignments. Both labs operate primarily on a drop-in basis, but the Writing Lab also offers appointments. The computer lab has the latest Microsoft software, math tutorials, and Internet access.

Center for Spirit at Work

UNH is the home of the Association for Spirit at Work (ASAW), a membership organization with local chapters worldwide. The center provides community, information, education, and resources to those integrating their work and their spirituality. We also serve those who support societal transformation through organizational development and change. We offer educational programs and speakers to the UNH community, and consulting, research, and coaching services to the local, national, and international business community. In addition, we created and steward the International Spirit at Work Awards, given to enlightened companies each year at an international conference. For more information, please visit our website at www.spiritatwork.org.

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

The UNH Center for the Study of Victims' Rights, Remedies, and Resources is housed in the School of Public Safety and Professional Studies 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: Facilities

Information Services provides for the computing needs of both academic and administrative users. The university maintains a number of computing facilities. The primary, general-purpose computer lab is on the first floor of Echlin Hall and, like the CAEC Lab in Buckman Hall 225, is staffed evenings and weekends. The computers contain web-browsers, Microsoft Office, statistical analysis, and other university-standard software. Additional labs, located throughout the campus, are discipline-specific and used primarily for instruction. Computers are also available for use in Marvin K. Peterson library.

Special-purpose computing facilities include the CAEC lab (see above), the graphic art and design lab in Sheffield Hall, the Industrial Engineering CAD/CAM lab in Buckman 129, the Computer Science AT&T lab in Echlin 206, the AT&T multimedia lab in Buckman 227, the Electrical Engineering lab in Buckman 203, 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 216, the School of Hospitality and Tourism lab in Harugari 114, the School of Business lab in Dodds 103, 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 semester and are posted on the door of each lab or may be ascertained by browsing http://intra (on campus only).

Information Services: Technology Fee

The technology fee entitles each student to an educational-license copy of Microsoft Office, which may be picked up in the Student Support Office (Echlin 115) or the Campus Card Office (Echlin 114) or at other locations announced each term. Additional Microsoft software titles and anti-virus software are also available, at a $15-per-title fee payable at the Bursar's Office. Then, simply present your receipt when picking up the software. 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.

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, stacks, and reference areas. Information is made accessible through manual as well as electronic retrieval methods. Computers with Internet access and the Microsoft Office Suite 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 165 ports available 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 disks.

The library's homepage is available via the web at http://library.newhaven.edu. 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 charged out can be renewed online. Recent additions to the collection are listed on the library's homepage. Library Guides, prepared by professional librarians, are posted. Interlibrary loan forms for students and faculty are available online. Electronic access to over 14,500 full-text electronic journal holdings is accessible from a link on this home-page. Faculty and students in their offices or residence halls or at home have access to commercial online databases through the "PROXY Connection" available on the library's homepage.

UNH subscribes to many online electronic databases in all subjects. Additional resources, including many full-text sources, are accessed in online databases such as LEXIS/NEXIS, 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, GPO on SilverPlatter, and IRIS.

The UNH library's collection includes more than 239,000 volumes, 1,400 journal and newspaper subscriptions, electronic access to over 14,500 full-text journal and newspaper titles, 535,000 pieces of microfiche, 12,000 volumes of microfilm, and 162,500 paper U.S. Government Documents.

The main library is a U.S. Government Documents Depository Library and selects approximately one third of the government 's 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 OCLC, UNH has access through interlibrary loan to the over 57 million records of more than 90,000 member libraries. The library uses telefacsimile and electronic means to transmit articles and information between itself and other libraries across the country.

Students are assisted by professional reference librarians. One-on-one consultations are available to locate information for research papers and projects. Freshmen receive instruction in how to use a modern library. Subject-specific library orientations are available for upperclass and graduate students. Bibliographic 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 help facilitate access to information resources for effective research. Sample topics covered include Forensic Science, Psychology, National Security Resources, Dietetics and Nutrition, Criminal Justice, Biology, Dental Hygiene, Business Information, an APA Style Guide, an MLA Style Guide, 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. Entities administered under the Foundation's auspices are the Center for Family Business and the Seton Gallery.

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 such segments of

its membership as managers, leaders, successors, and women. Forum members meet monthly to discuss issues of importance to their group.

The Seton Gallery, in Dodds Hall, provides a showcase for a wide variety of artistic works. Its mission is to be an active participant in the local, regional, and national art community. Diversity of exhibits furthers the university's commitment to educate both the campus community and the general public. The Seton Gallery is committed to sustaining a strong tradition of creative expression, cultural enrichment, and innovative community outreach.

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 credit hours or 27 undergraduate credit hours. A one-time membership fee is included in the graduation petition fee. There are currently more than 30,000 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 network of over 30,000 graduates of UNH. Alumni can search the directory, review job postings and resumes, post class notes, sign up for a UNH email address, and more. Permanent lifetime membership ID cards are issued to Alumni Association members soon after graduation.

Insight, the alumni magazine, is mailed to all members regularly. Fall Weekend, class reunions, an annual Scholarship Ball, estate planning seminars, and other educational and social events offer opportunities for continued contact with UNH and fellow alumni.

Regional alumni clubs across the nation offer additional opportunities for active involvement. Alumni clubs sponsor social and career networking receptions, seminars, family-oriented events, fund raising, and sporting activities.

Alumni board members govern 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.

Athletics

Graduate students are encouraged to make use of the North Campus athletic complex. Facilities include a basketball court, racquetball courts, fitness center, three tennis courts, a softball field, Vieira Baseball Field, and Dodds Stadium.

Graduate students are eligible to take part in the intramural competitions in touch football, table tennis, basketball, racquetball, softball, tennis, and volleyball.

A student ID card must be presented for admittance to the gymnasium building/facilities after 5 p.m. on weekdays and at all times on weekends.

Career Development

The Career Development Office provides a wide range of employment-related services to the entire university community, including undergraduates, graduate students, and alumni. We assist in the preparation of key documents: the resume, the cover letter, the thank-you letter. We give pointers on essential interview skills. Students can check our listings of local part-time positions, including some on campus, throughout the school year. (The Financial Aid Office will help with information on college work-study.) Students may also review our internship listings for Connecticut and surrounding states. (Students must consult their departmental advisor to obtain an internship.) In addition, we maintain an extensive library of impor-

tant information on various career choices as well as on requirements for graduate and professional programs and degrees.

Students should be alert to our ongoing advertisements. We sponsor frequent opportunities in the form of job fairs, visits, discussions, and interview sessions with expert representatives from business, industry, and government employers. Our best advice: Take advantage of our services as early as possible, even before you begin the actual job search.

Counseling Center

The Counseling Center in the lower level of Sheffield Hall offers assistance and counseling to students with vocational and 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, prophylaxes (cleanings), oral hygiene instructions, fluoride treatments, pit and fissure sealants, and radiographs.

Fees are charged on a sliding scale, 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 all 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, students should contact the director 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, and the director can be reached by voice/TDD at (203) 932-7331. The Vice President for Student Affairs and Athletics has been designated as the university's 504/ADA coordinator and can be reached at (203)932-7199.

Evening Services

Evening Services is a "one-stop" office specifically designed for evening graduate and undergraduate students. It combines the functions of Admissions, Financial Aid, Records, and the Business Office while working closely with the Office of Academic Services to ensure a "user-friendly" environment for the evening student population. In addition, the Evening Services staff is available to meet student needs and answer questions regarding all UNH activities, including student advising on a limited basis.

The Evening Services office is located in

Kaplan Hall, Room 210. Hours of operation are Monday through Thursday from 10:00 am until 7:00 pm, and Friday, 8:30 am until 4:30 pm. You can reach staff members by calling 203-932-7361, fax: 203-931-6063, and email: eveningservices@newhaven.edu.

Food Services

The University Dining Services consist of the Marketplace Food Court, Jazzman's Café, Pandini's, Sky Ranch Grill, the Quad Convenience Store, and University Catering. The Food Court, Jazzman's, and University Catering are located in Bartel's Hall, the Campus Center. Pandini's and Sky Ranch Grill are located in our newest residence hall, Beckerman Hall. The Quad C-Store is located on the first floor of Botwinik Hall.

Marketplace Food Court offerings include:
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 offers:
Gourmet Coffee, Cappuccino, and Espresso
Fresh-baked muffins, scones, and other baked goods
Sandwiches, Salads, and Snacks
Fruit Smoothies and Cold Beverages

Pandini's offers:
Freshly made Pizzas
Baked and Sautéed Pastas
Strombolis and Calzones
Italian Sandwiches
Entrée Salads
Desserts and Beverages

Sky Ranch Grill offers:
1/3 pound 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 Dining Services. We welcome your comments and suggestions. Our office is conveniently located on the lower level of the Campus Center.

Graduate Housing

On-campus housing for graduate students is not currently available. However, the Office of Residential Life maintains a listing of off-campus accommodations including 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 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.

All 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.

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

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

International Student Services

Each year the University of New Haven admits students from many nations. These students, representing more than 50 different countries, bring an international dimension to the campus.

The International Services Office provides for the special needs and concerns of all international students. The staff assists students with government regulations, provides information on travel to and from the United States, and advises students on academic, social, and cultural adjustment. The office also serves as a liaison between the student and the university community.

A wide range of relevant programs includes publication of an international newsletter, special orientation events, information seminars, and an international festival. For more information, call (203) 932-7475.

Office of University Advancement

Staff members of this office work with the president of the university, the Board of Governors, faculty, and staff to secure both short- and long-term funding for enhancement of the university's programs and facilities. Funds are sought for new buildings and renovations; student financial aid; endowed chairs, professorships, and lectureships; faculty development; scientific and technical equipment; library resources; and other institutional opportunities for growth over and above what can be achieved from regular and anticipated university income.

National and local foundations, corporations, parents, students, alumni, faculty, and friends support these efforts and contribute to the excellence of the university.

Multicultural Affairs and Services

The staff of the Office of Multicultural Affairs and Services works cooperatively with the campus community to assist and support students of color. The mission of the staff is to serve minority students by developing cultural and cross-cultural programs, workshops, and lectures as well as to provide supplemental counseling for social, personal, and academic needs.

It is a goal of this department to enrich the educational experience of minority students by encouraging utilization of the facilities and programs at the university and in the Greater New Haven area. In addition, the staff is dedicated to enhancing awareness of and sensitivity toward the needs of the minority student population.

University Police Department

The staff of the University Police Department 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. In accordance with state and federal laws the department maintains information related to campus crime statistics and security measures. This information is available in print form at the department and

on the UNH website. Located in the lower level of the Campus Store building, the University Police Department is fully staffed 24 hours a day. The telephone number is (203) 932-7014 or 1-800-DIAL-UNH, ext. 7014. *The University of New Haven is not responsible for damage to, or theft from, personal vehicles parked on university property.*

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 DVA. The office provides forms for DVA benefits, advises student on procedural requirements, and certifies enrollment. Both the DVA and the Registrar's office closely monitor each student's status and academic progress.

For information on eligibility and payment or on how to apply for benefits or to transfer your existing benefits to UNH, contact:

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 Benefits Coordinator during office hours, Monday through Friday, 8:30 a.m to 4:30 p.m., at:

(203) 932-7388 or (203) 932-7304
Fax: (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 credit hours of graduate work, or 9 credit hours of graduate work and at least 3 additional undergraduate credit hours, are eligible for membership.

Additional information may be obtained by contacting the Alpha Tau advisor, Dr. James Monahan, in the Department of Criminal Justice.

Black Graduate Association

Founded in 1993, the Black Graduate Association provides a cultural, academic, and social environment within which graduate students and alumni/ae of African descent may interact, network, and associate. A major interest of the BGA is development of scholarship support for graduate study. Meetings and events are held evenings and weekends to accommodate working students. Membership is open to current students and alumni of the Graduate School.

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 interest and are eligible to participate in regional and national programs and activities.

Graduate Sport Management Club

The Management of Sports Industries program has a student club called the Graduate Sport Management Club which 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 Sport Industries Club.

Graduate Student Council

Founded in 1976, the Graduate Student Council has expanded its horizons 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 all graduate students each trimester. Thus, all graduate students enrolled at UNH are automatically members and share in the activities of the council.

The purposes of the council are to promote the welfare of all Graduate School students, to give them counsel and encouragement, to encourage their active participation in the determination of their academic environment, to develop and encourage 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 biannual 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 purpose is to recognize, foster, and reward outstanding scholastic achievement; stimulate interest in the field of communication; and 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, a nonprofit organization dedicated to improving the quality of graduate and professional student life in the U.S. 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 U.S. Congress on issues affecting financial aid, student loans, and taxation of tuition benefits, etc. 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. At the website all students 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 over 700. The honorary society was founded at the Ninth International Congress of Psychology at Yale University in 1929. Psychology program students are elected to Psi Chi to honor achievement in their chosen field.

Sigma Beta Delta

Sigma Beta Delta is a national honor society in business, management, and administration. The UNH School of Business chapter was inaugurated in May of 1994. UNH faculty are inducted as members, and graduate and undergraduate students are honored with initiation.

Student Publications

Student publications include *The Charger Bulletin*, the university student newspaper, and *The Chariot*, the annual yearbook. Published under the auspices of the English Department, *The Elm City Review* is a student literary publication that provides an audience for creative writing selected from students' submissions of prose fiction and nonfiction as well as poetry. Students may volunteer to work on these student publications.

WNHU Radio

WNHU, the university's student-operated FM stereo broadcast facility, is operated by the Communication Department of the School of Business throughout the year on a frequency of 88.7 MHz at a power of 1,700 watts. This extracurricular enterprise, open to all undergraduate and graduate students, has a 30-mile radius, serving southern Connecticut and eastern Long Island with music, news, sports, and weather. The WNHU broadcast day features different types of music 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 all qualified students in their respective areas of interest; no prior radio experience is necessary.

ACADEMIC PROGRAMS

College of Arts & Sciences

Graduate Degree Programs

Cellular & Molecular Biology, MS
Community Psychology, MA
Education, MS
- Teacher Certification
- Professional Education

Environmental Science, MS
Human Nutrition, MS
Industrial/Organizational Psychology, MA

Graduate Certificates

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

School of Business

Graduate Business Degree Programs

MBA, Business Administration
MBA, Emerging Leaders
MBA, Executive Program

Other Graduate Degree Programs

MPA, Public Administration
MBA/MPA, dual degree
Health Care Administration, MS
Labor Relations, MS
Management of Sports Industries, MS
Taxation, MS

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
Telecommunication Management

Tagliatela School of Engineering

Graduate Degree Programs

Computer Science, MS
Electrical Engineering, MS
Environmental Engineering, MS
Executive Engineering Management, MS
Industrial Engineering, MSIE
MBA/MSIE, dual degree
Mechanical Engineering, MSME
Operations Research, MS

Graduate Certificates

Civil Engineering Design
Computer Applications
Computer Programming
Computing
Logistics
Quality Engineering

School of Hospitality & Tourism

Graduate Degree Program

Executive Tourism & Hospitality Management, MS

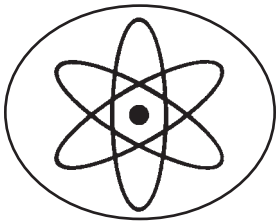
School of Public Safety & Professional Studies

Graduate Degree Programs

Criminal Justice, MS
Fire Science, MS
Forensic Science, MS
Industrial Hygiene, MS
National Security & Public Safety, MS
Occupational Safety &
Health Management, MS

Graduate Certificates

Fire/Arson Investigation
Fire Science Technology
Forensic Computer Investigation
Forensic Psychology
Forensic Science/Advanced Investigation
Forensic Science/Criminalistics
Forensic Science/Fire Science
Industrial Hygiene
Information Protection and Security
National Security
Occupational Safety
Public Safety Management
Victim Advocacy and Services Management



COLLEGE OF ARTS AND SCIENCES

Daniel N. Nelson, PhD, Dean
Robert D. Greenberg, PhD, Associate Dean
Gordon R. Simerson, PhD, Associate 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 of the 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 coursework 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, music and sound recording to psychology, and a liberal studies degree. A combined five-year BS/MS program in environmental science is offered for students who meet certain qualifications.

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. Assistant Professor of Biology and Environmental Science, PhD, 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, will provide students with the preparation needed to meet the need for advanced training. The central curriculum consists of courses in biochemistry, cell biology, genomics, and molecular biology. These courses will develop the student's ability to function as an independent scientist by stressing both conceptual and technical aspects of each subject.

Admission Policy

Application for the cellular and molecular biology program may be submitted at any time; however, full-time admission to the program will be 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 coursework 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 of study. Upon completion of the provisional requirements, the student's record will be 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.

MS, Cellular and Molecular Biology

A minimum of 38 credit hours 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 credit hours 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 all specific departmental requirements.

Required Courses

BI 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:

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

Plus two of the following:

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

MB 602 Biochemistry of Bioenergetics
MB 620 Bioinformatics
MB 625 Advanced Bioinformatics
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
MG 670 Special Topics in Biotechnology Management

Total Credits: 38-41

Community Psychology

Coordinator: Michael A. Morris, Professor of Psychology, PhD, Boston College

The field of community psychology applies the theories and techniques of 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 MA program in community psychology provides training in current approaches to preventing and treating psychological distress, emphasizing interventions at the level of social institutions, organizations, and groups as well as the individual. Community analysis, consultation, and crisis intervention are considered, 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. 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 may be asked to submit a questionnaire in addition to the materials required by the Graduate School. They 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's 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 development of the 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 is required in which students analyze and integrate their internship with relevant research and coursework.

Thesis

Students may choose to write a thesis as part of the program of study. The thesis must demonstrate an ability to organize materials in a clear and original manner and to present well-reasoned conclusions. 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 all specific departmental requirements.

MA, Community Psychology

The program consists of 45 credit hours, 24 of which comprise the core curriculum completed by all students and 12 of which constitute one of three areas of concentration.

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)

Total credits: 45

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.

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

Total credits: 12

See the Table of Contents for the community-clinical concentration offered in the program leading to the master's degree in public administration (MPA).

Concentration in Program Development

The 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 at the community, organizational, and social-systems levels 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

Total credits: 12

Concentration in Forensic Psychology

The 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 Outcome Evaluation
P 658 Forensic Treatment Models

Total credits: 12

Education Programs

The Education Department offers two programs of graduate study: (1) Teacher Certification for those seeking initial teacher 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), and business; (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). 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 Accelerated Entry Program for UNH undergraduates interested in a teaching career enables students to begin their teacher preparation program as undergraduates. While enrolled in other programs, students can earn a bachelor's degree, master's degree, and Connecticut teaching certification in five years. Contact the Education Department for information.

Education: Teacher Certification

Chair: Jacqueline Jacoby, EdD, Boston College, Educational Administration, 6th Year Certificate, Lehigh University, PA
Certification Officer: Phyllis S. Gwatkin, MS, Fordham University; CAGS, St. Joseph College
Director of Student Teaching: Susanne Murphy, MA, Yale University; MS and CAGS, Southern CT State University
Coordinator of Internships: Nicholas Maiorino, MS, Sixth Year Certificate, Southern Connecticut State University

The Teacher Certification program prepares educators for teaching diverse student populations with a variety of learning needs. Teacher candidates are required to enter the program with a strong academic or interdisciplinary major from their undergraduate institution. The Education Program builds on this previous knowledge while blending educational theory with effective pedagogical practice. Particular emphasis is placed on linking field experiences to coursework. Because teacher candidates are expected to teach diverse student populations, students participate in both urban and suburban field experiences.

Admission Policy

Applicants must hold a baccalaureate degree from an accredited institution of higher education, with an academic or interdisciplinary major. Applicants must have a broad range of general education courses as well as courses specific to the subject area and/or level of certification sought. In addition, all candidates must meet the requirement for one three-credit course in United States history, which may be credited from undergraduate coursework or fulfilled in the university's graduate program by taking an elective (HS 610 Survey of United States History). Official undergraduate transcripts must be submitted for review to determine whether or not candidates have successfully met background requirements.

A minimum grade point average of 2.7 (equivalent to a B-) is required for admission. In addition to coursework and grade requirements, all applicants must pass PRAXIS I or obtain an approved waiver from the state of Connecticut prior to admission. Applicants must submit two letters of recommendation and an essay describing their experience relevant to teaching as well as reasons for applying to the program. All prospective students are interviewed. Information packets outlining admission criteria are available from the Education Department or the Graduate Admissions Office. Information sessions are held periodically throughout the year.

MS, Education (Teacher Certification)

A total of 36 credit hours is required for completion of the degree of Master of Science in Education. Typically, the degree can be completed in one year. To obtain teaching certification, students must also take six credits of student teaching (ED 600), as required for Connecticut certification. Students should note that these six credits are taken in addition to the 36 credits required for the MS degree and that student teaching credits do not count toward the MS degree. Successful completion of student teaching is required before students are recommended to the Connecticut State Department of Education for initial teacher certification.

All students begin the program by attending orientation sessions and ED 601 (Introduction to Education), a required one-credit course designed to introduce students to the field of education. ED 601 is offered in August for those students beginning their studies in September and in December for those beginning in January. Students may begin the program in either the fall or winter term.

Full-time students take their courses together as a cohort, fostering collegiality and professional relationships that frequently continue beyond the program's duration.

Field Experiences

Intern Students: Supervised internships are available. An intern is expected to work in a school district in Connecticut for the entire school year. 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) Students: Students who do not choose the internship option must complete field experiences while in their program. In the final field experience, students will be placed in a classroom under the guidance of a teacher and a university supervisor for a minimum of two weeks. This field experience provides students opportunities for observing experienced teachers, implementing selected lesson plans, and reflecting on practice.

Student Teaching: Before beginning the student teaching field experience, all students must pass PRAXIS II and complete all prerequisites and all professional courses. Secondary students must pass Praxis II before beginning Student Teaching. Candidates participate in a supervised field placement under the guidance of a qualified classroom teacher. Students may also be required to attend student teaching seminars during this period.

Elementary Certification (Grades K-6)

The following courses are required for students seeking elementary certification (Grades K-6):

Required Courses

Core Courses (16-17 credits)
ED 601 Introduction to Education (1 credit)
ED 604 Educational Psychology
ED 605 Students with Special Needs
ED 608 Child Development
ED 620 Seminar in Multicultural Issues (1 credit)
ED 680 Contemporary Issues
ED 683 Computer Applications for Teachers (2-3 credits)

Strategies Courses (14 credits)

ED 621E Teaching Strategies in Mathematics (2 credits)
ED 622E Teaching Strategies in Science (2 credits)
ED 623E Teaching Strategies in Social Studies (2 credits)
ED 626E Strategies for Teaching Reading & Language Arts in Elementary School
ED 628 Reading Diagnosis and Remediation
ED 630E Children's Literature (2 credits)

Field experience III (2 credits)

ED 694 Field Experience III
or ED 691 Capstone Project

Other requirements

Students must pass, as a degree requirement, a comprehensive examination on pedagogy.

Plus:
Electives (3-4 credits)

Total credits: 36

Secondary Certification (Grades 7-12)

The following courses are required for students seeking secondary certification (Grades 7-12):

Required Courses

Core Courses (19-20 credits)
ED 601 Introduction to Education (1 credit)
ED 604 Educational Psychology
ED 605 Students with Special Needs
ED 609 Adolescent Development
ED 620 Seminar in Multicultural Issues (1 credit)

ED 680 Contemporary Issues
ED 682 Measurement, Assessment, and Evaluation
ED 683 Computer Applications for Teachers (2-3 credits)

Strategies Courses (7 credits)

ED 626S Reading in the Content Areas (2 credits)

Plus one of the following:

ED 627 Writing in the Content Areas (2 credits)
or ED 630S Literature for Secondary School (2 credits)

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

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

Field experience III (2 credits)

ED 694 Field Experience III
or ED 691 Capstone Project

Other requirements:

Students are required to pass, as a degree requirement, a comprehensive examination on pedagogy.

Plus:
Electives (7-8 credits)

Total credits: 36

Applying for State Certification

In the certification process, the university must recommend the candidate to the Connecticut State Department of Education. After students have successfully completed the professional courses in their program, including Student Teaching (ED 600), the Certification Officer verifies that students 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 of the laws 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 to the U.S. Congress an annual report on the quality of teacher preparation. The full report of annual data for the University of New Haven's performance is available from the Education Department.

Education: Professional Education

Chair: Jacqueline Jacoby, EdD, Boston College, Educational Administration, 6th Year Certificate, Lehigh University, PA

This program, also leading to the master of science degree in education, provides a curriculum for continuing professional growth. Applicants must hold a baccalaureate degree from an accredited institution of higher learning and a teaching certification in Connecticut or elsewhere.

Two letters of recommendation, a copy of transcripts, certification document, and an essay setting forth the student's reasons for enrolling in the program are required. All prospective students are required to complete

an interview and to have their undergraduate transcripts evaluated by the Certification Officer.

MS, Professional Education

A total of 36 credits is required for completion of the master of science degree in education. Five required courses are in professional education. Given the breadth that strategies courses offer even to professional teachers, eight or more credits of strategies courses are required. In addition, students are encouraged to take content electives.

Students who are classroom teachers may elect to complete a research project using their own classroom for their research; others will be required to complete a teaching portfolio.

Required Courses

Core Courses (15-16 credits)
ED 604 Educational Psychology
ED 612 Curriculum Design
ED 620 Seminar in Multicultural Issues (1 credit)
ED 682 Measurement, Assessment, and Evaluation
ED 683 Computer Applications for Teachers

Plus:
ED 685 Research in the Schools,
or ED 690 Research Project,
or ED 694 Field Experience III

Plus:
Approved electives (20-21 credits)

Total credits: 36

Environmental Science

Coordinator: Roman N. Zajac, Professor of Biology and Environmental Science, PhD, 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 comprised 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 and science are needed by employers in these 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, 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 science 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 prerequisite requirements will be required to complete them before enrolling in certain specific graduate courses, as will be

determined in consultation with the program coordinator.

It is expected that all prerequisites will be completed either prior to enrolling in graduate courses or within one 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 program prerequisite may choose to take CH 600 Introduction to Environmental Chemistry to fulfill this requirement. It should be noted, however, that CH 600 Introduction to Environmental Chemistry is taken on an excess-credit basis and will not be counted towards fulfilling the program requirement of 42 graduate credits.

MS, Environmental Science

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

The program consists of five required core courses plus an additional nine courses that may be taken in a specified area of concentration. Note that students who do not choose to concentrate in a particular area will be 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 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 Graduate School policy on theses as well as all 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 will be determined in consultation with the program coordinator and the thesis advisor and will include 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 some 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
EN 601 Principles of Ecology with Laboratory (4 credits)
EN 690 Research Project*
Concentration or Approved Electives

Minimum total credits: 42

**Students will select a topic in their area of concentration for completion of EN 690 Research Project.*

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

Concentrations

Students may elect to pursue one of the following four specific concentrations for the elective portion of the program. As students declare a concentration, they will be assigned to the faculty advisor responsible for it, and the advisor will help the student formulate an individual program and the required approved electives, which must be selected from at least two other concentration areas.

Concentration in Environmental Ecology

Concentration Advisor: Roman N. Zajac, Professor of Biology and Environmental Science, PhD, University of Connecticut

EN 602 Environmental Effects of Pollutants
EN 606 Environmental Data Analysis
EN 607 Environmental Reports and Impact Assessment
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
EN 608 Landscape Ecology
EN 621 Hydrology (4 credits)
EN 650 Environmental Microbiology (4 credits)
EN 670 Selected Topics

Minimum total credits: 26

Concentration in Environmental Geoscience

Concentration Advisor: R. Laurence Davis, Professor of Earth and Environmental Science, PhD, 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

Minimum total credits: 26

Concentration in Environmental Health and Management

Concentration Advisor. Roman N. Zajac, Professor of Biology and Environmental Science, PhD, 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

Minimum total credits: 26

Concentration in Geographical Information Systems and Applications

Concentration Advisor: Daniel DePodesta, Practitioner-in-Residence in Biology and Environmental Science, MBA, 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 Application of GIS in Environmental Science
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

Minimum total credits: 26

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

***Other courses may be substituted with the approval of the concentration advisor/program coordinator. Courses in environmental engineering, chemistry, occupational safety and health, and/or computer science may also be approved as electives.*

Human Nutrition

Coordinator: Rosa A. Mo, Human Nutrition Graduate Program, EdD, RD, 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 may apply up-to-date and in-depth nutritional knowledge in their areas of specialization and gain a foundation for further study at the PhD 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 a detailed study of 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 at the main campus both Saturdays and Sundays from 9 a.m. to 5 p.m.

Admission Policy

This program is most appropriate for registered dietitians and certain other licensed health professionals or for high school science teachers and/or 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 coursework in introductory biochemistry or organic chemistry plus human anatomy and physiology.

MS, Human Nutrition

Completion of a total of 33 graduate credit hours is required for the Master of Science, Human Nutrition degree.

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
NU 611 Nutrition and Disease II
NU 612 Nutrition and Health: Contemporary Issues and Controversies
NU 613 Maternal and Child Nutrition
NU 690 Research Project

Total credits: 33

Program Options—Human Nutrition

Students enrolled in the Master of Science, Human Nutrition program may wish to complete undergraduate courses that would ful-

fill 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, the candidate may sit for the exam to become a registered dietitian (RD).

Industrial/Organizational Psychology

Coordinator: Stuart D. Sidle, Assistant Professor, Industrial Organizational Psychology, PhD, DePaul University

The study and practice of industrial and organizational psychology is 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 and 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:

- 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 as well as providing 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 haven 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 will be 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, all 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.

MA, Industrial/ Organizational Psychology

A total of 48 credit hours is required of candidates for the degree of master of arts in industrial/organizational psychology. Candidates for this degree must complete 24 credit hours of required courses in the core curriculum. Another 24 credit hours (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 credit hours of electives until they have satisfied the core requirements. Up to nine credit hours 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 will be 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 Graduate School policy on theses as well as all 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 realistic introduction to an organizational environment; or a practicum, for those already employed.

Option 1 (Thesis) is intended primarily for those 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 PhD program.

Option 2 (Internship/Practicum) allows the student to acquire special skills by coordinating formal coursework with an internship or practicum in an organizational setting. The internship gives the student with limited work experience the 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 will be established jointly by the cooperating organization, the program coordinator, and the student. A comprehensive project report is required in which the student will analyze and integrate internship/practicum experi-

ences 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 interest. A comprehensive examination covering material from the required core psychology courses is required under this option.

Program Concentrations

Within each of the program options described above, students may concentrate in (1) the industrial-personnel area, (2) the organizational area, or (3) the field of conflict management. A concentration requires 12 credit hours of specific elective courses, which are counted as part of the 24 credits required in the elective option (Thesis, Internship/Practicum, or Approved Electives) selected by the student for completion of the program. 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)

Total credits: 48

Program Options

Option 1 (Thesis)
P 698/699 Thesis I and II
Electives** (18 credits)

Option 2 (Internship/Practicum)
P 693/694 Organizational Internship I and II
or P 678/679 Practicum I and II
Electives** (18 credits)

Option 3 (Approved Electives)
Comprehensive examination required
Electives** (24 credits)

**Undergraduate preparation in statistics is prerequisite.*

** *The choice of electives is made in consultation with the program coordinator in light of the student's academic and professional goals.*

Concentration in Industrial-Human Resources Psychology

Advisor: Stuart D. Sidle, Assistant Professor, Industrial Organizational Psychology, PhD, DePaul University

Students who select this concentration will count these course credits toward the elective courses required in one of the program options listed previously.

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

Total credits: 12

Concentration in Organizational Development and Consultation

Advisor: Stuart D. Sidle, Assistant Professor, Industrial Organizational Psychology, PhD, DePaul University

Students who select this concentration will count these course credits toward the elective courses required in one of the program options listed previously.
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

Total credits: 12

Concentration in the Psychology of Conflict Management

Advisor: Stuart D. Sidle, Assistant Professor, Industrial Organizational Psychology, PhD, DePaul University

Students who select this concentration will count these course credits toward the elective courses required in one of the program options listed previously.

P 643 The Psychology of Conflict Management I
P 646 The Psychology of Conflict Management II

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

Total credits: 12

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 yet be ready to commit themselves 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 of Psychology, PhD, 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 one whose degree is in a nonpsychological field or of one with a degree in psychology who wishes to broaden his or her skills to a new area of psychology. Courses will be 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.

Any four of the following:

P 610 Program Evaluation
P 621 Behavior Modification I: Principles, Theories, and Applications
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

Total credits: 12

Bioinformatics Certificate

Advisor: Anthony Melillo, Practitioner in Residence, Biology and Environmental Sciences, MS, University of New Haven

This certificate program will provide a practical, "hands-on" approach to computer applications in molecular biology and will focus 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: molecular biology students with limited experience in computer systems who wish to upgrade their skills and knowledge in the field of bioinformatics; computer science students with existing computational or mathematical skills who wish to learn how to apply those skills to real biological problems.

The curriculum for this concentration (five courses, a total of 15 credits) which combines computer science, molecular genetics, and bioinformatics courses.

Required courses:

CS 622 Database systems
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

Prerequisites for the certificate:

The prerequisites are undergraduate molecular biology or biochemistry and college algebra.

Forensic Psychology Certificate

Advisor: James J. Cassidy, Associate Professor, Criminal Justice, PhD, Hahnemann University; JD, Villanova University, School of Law

This certificate program, offered by the Psychology and Criminal Justice Departments, is a 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 MS Community Psychology and Criminal Justice programs. Prerequisites: CJ 601 and CJ 605 or equivalent.

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

Total credits: 12

Geographical Information Systems Certificate

Advisor: Daniel DePodesta, Practitioner-in-Residence in Biology and Environmental Science, MBA, Quinnipiac University

The certificate in geographical information systems (GIS) provides professional training in the technology and application of comput-

erized 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. Coursework provides knowledge of basic and advanced GIS techniques, developing procedures and databases for specific applications, as well as technologies and analyses supporting GIS. The 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

Total credits: 12

Students having previous GIS experience may substitute, with the advisor's approval, other courses for EN 640 and/or EN 641. Suggested substitutions, depending on a student's area of interest, 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 of Political Science, PhD, University of Virginia

This certificate is designed to introduce students to elements of international life relevant to the growth of a global political-economic system. Courses will 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 will be 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

Total credits: 12

Legal Studies Certificate

Advisor: Natalie J. Ferringer, Professor of Political Science, PhD, University of Virginia

This certificate is designed to provide a background in and orientation to constitutional and legal issues in contemporary American and global societies by exploring basic constitutional principles and the levels at which legal conflicts may arise. Students will be introduced to basic principles and

practices of the American legal system, including some elements that pertain to international activity, and will learn to recognize areas of potential legal conflict at all levels of the system—legislative, judicial, administrative, and regulatory.

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

Total credits: 12

Psychology of Conflict Management Certificate

Advisor: Stuart D. Sidle, Assistant Professor, Industrial Organizational Psychology, PhD, 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 communication, negotiation, and mediation skills. Skill development will enable students to resolve both personal and professional conflicts more effectively, as well as help build the tools necessary for those interested in becoming mediators or organizational consultants specializing in conflict management.

P 643 The Psychology of Conflict Management I
P 646 The Psychology of Conflict Management II
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

Total credits: 12

SCHOOL OF BUSINESS

Jess S. Boronico, PhD, Dean

The primary mission of the School of Business is to provide high-quality, career-oriented education to students with 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 School of Business provides contemporary educational experiences of high quality in order to prepare students to face the challenges of a dynamic, modern world and to meet their responsibilities within a global society. To meet these goals, career-oriented programs are provided, employing current knowledge and techniques presented in a manner appropriate to the diverse backgrounds and experience of our graduate students.

Through the Graduate School, the School of Business offers an MBA program, an Executive MBA program, and master's degree programs in a number of other business fields. A master's in public administration (MPA) as well as two dual degrees, MBA/MPA and MBA/MS Industrial Engineering, are also available. Master of Science degrees are offered in health care administration, labor relations, and management of sports industries. 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 School of Business offers associate's and bachelor's degree programs in the departments of accounting, communication, economics and finance, marketing and international business, and management.

Master of Business Administration (MBA)

Director MBA and Accelerated Programs: Richard Laria, MBA, Adelphi University
Academic Advisor: Charles N. Coleman, Assistant Professor of Public Management, MPA, West Virginia University

The MBA curriculum is designed to prepare 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 MBA program, the university offers two MBA dual degree programs: one combined with the master's program in public administration (MBA/MPA) and one combined with the master's program in industrial engineering (MBA/MSIE).

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

Candidates for admission to the MBA program are required to hold a four-year baccalaureate degree (or equivalent) from an accredited institution. An undergraduate degree in business is not a requirement. Students will be evaluated on an individual basis, and an interview may be required. 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 and/or business experience, and two letters of recommendation. For detailed information, please contact the Director of MBA Programs.

Curriculum

The MBA curriculum is focused primarily on advanced topics; however, students without previous studies in business will complete a maximum of 18 credits in introductory core courses before proceeding to the 30-36 credits of advanced courses and electives. The program stresses alternate approaches to studies in organizational communication, production, corporate valuation, and organizational change.

Students may choose from a wide variety of alternatives for their advanced elective courses. Concentrations are offered in nine different areas, ranging from accounting to sports management.

Students will begin their studies with the six required Core Courses. Any of these six required Core Courses may be waived on the basis of the student's undergraduate coursework 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 appropriate 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 transfer policies of the Graduate School. After admission, any graduate courses taken for transfer must have prior approval with a signed Coordinated Course Form.

Completion of the elective portion of the MBA program may be accomplished by tak-

ing 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 in the pages immediately following this section. Students taking non-business elective courses must contact the MBA 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 MBA electing to write a thesis must register for a minimum of six thesis credits in the appropriate business department and would substitute these 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 Graduate School policy on theses as well as all specific departmental requirements.

Students who begin as in-process students taking graduate courses in the School of Business may enroll only in the Core Courses (A 620, EC 601, FI 601, MG 637, MK 609, QA 604) unless permission is granted by the advisor of the MBA program.

In order to become fully matriculated in the MBA program, students who are admitted provisionally must complete, with satisfactory grades as specified in the letter of acceptance, the following courses before enrolling in elective courses: QA 604 and any three other required Core Courses for which the prerequisites have been met. (For course prerequisites, refer to the course descriptions elsewhere in this catalog.)

Required Courses

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 & Society
MG669 Strategic Management
Electives or Concentration (12-18)

Total credits: 48-54
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 will be considered at the time of admission, including those based on a "B" (3.0) or better in the appropriate courses. Students who seek transfer credit must submit a written request (with a course syllabus, preferably, or course description of the previously completed coursework) to the MBA 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 the 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 will be issued for courses taken and subsequently waived.

Waiver Guidelines

The minimum course requirements, all taken within the last seven years, for waivers are:

A 620: one upper-division course in financial accounting
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 MBA 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 MBA program, or as soon as possible thereafter.

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

The courses listed for some concentrations include courses that also appear in the Advanced Courses. Students enrolled in a concentration who take any course(s) listed for that concentration to satisfy Advanced Course requirements may not count the same course credits toward the concentration credit requirements. Instead, the student will take other courses listed in the concentration to satisfy the required concentration credits.

The concentrations in finance, international business, and public relations have special requirements which affect the required portion of the curriculum. Students should consult the concentration descriptions and contact the appropriate advisor for additional information.

Concentration in Accounting

Concentration Advisor: Robert E. Wnek, Professor of Tax Law, Accounting, and Business; BSBA, Villanova University; JD, Delaware Law School of Widener University; LLM, Boston University School of Law; CPA

The concentration in the accounting program is recommended to those MBA students who desire an accounting specialization.

Required Courses

A 630 Topics in Corporate Financial Reporting*
A 654 Financial Statement Reporting and Analysis
A 633 Assurance Services (to be cross-listed with A 333)
A 604 Taxation of Business Entities (to be taken with Graduate Tax Program)
Plus any Accounting Elective

**Students having had two intermediate accounting undergraduate courses will substitute an accounting taxation elective for A630.*

Total Credits: 15

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.

FIFTH YEAR CPA EXAM TRACK

A 652 Auditing and Assurance Services Seminar
Any three Accounting or Taxation Electives

Total credits in concentration: 12

One Accounting or Taxation elective to be substituted for A621 Managerial Accounting

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 course completions.

Concentration in Finance

Concentration Advisor: Steven J. Shapiro, Associate Professor of Economics and Finance, PhD, Georgetown University

The goal of the finance concentration is to provide students with advanced study in financial services and corporate finance. The concentration emphasizes understanding and application of concepts that will be useful in career growth.

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

Total Credits: 15

Optional Track for Prospective Chartered Financial Analyst (CFA) Candidates

The optional track is designed for students interested in sitting for the CFA exams. The CFA track is designed to give 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 analytically oriented positions in the financial services industry.

Students planning on pursuing the CFA track take the following:

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

Total Credits: 18

Concentration in Global Marketing and E-Commerce

Concentration Advisor: Ben B. Judd, Professor of Marketing, PhD, 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.

Required Courses

IB 651 International Marketing
MK 639 Marketing Research and Information Systems
One international business topic course:
FI 632 International Financial Management
or IB Elective

One marketing topic course:
MK 616 Buyer Behavior
or Marketing Elective

One capstone course:
MK 643 Product Management
or MK 641 Marketing Management

Total Credits: 15

Concentration in Sports Management

Concentration Advisor: Gil B. Fried, Associate Professor, Sports Management, JD, Ohio State University

As sports have grown as an industry, the need has increased for sports managers with specialized business skills and training. This concentration is designed 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 this program is on business application in the key areas of facility management, sport finance, and collegiate athletic administration.

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

Total credits: 12

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

Concentration in Business Policy and Strategic Leadership

Concentration Advisor: Gil B. Fried, Associate Professor, Sports Management, JD, Ohio State University

The concentration in business policy and strategic leadership is designed to prepare 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.

Required Courses

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

Total Credits: 12

Concentration in Human Resource Management

Concentration Advisor: Gil B. Fried, Associate Professor, Sports Management, JD, Ohio State 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 the field and an opportunity to study various 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 new courses such as employment law and special topics designed to provide practical and experiential learning.

Four of the following:

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

Total Credits: 12

Master of Business Administration Emerging Leaders Program

Director: Richard Laria, MBA, Adelphi University

The Emerging Leaders MBA requires a bachelor's degree and two or more years of business or professional experience. In less than two years a cohort of 15 to 25 MBA students can complete an MBA degree that develops the skills, knowledge, and values today's manager must possess to be successful. The program has a modular curriculum which includes core and advanced courses, each taken in a five-week increment. Each course is a building block for the next. The same group of students remains together for the entire seminar-style program. Courses are held on Saturdays or weekdays. Classes break for all major holidays and for 5 to 6 weeks in the summer. Classes meet in Waterbury, New London, and Stratford.

Admission Policy

Candidates for admission to the Emerging Leaders program are required to hold a four-year baccalaureate degree (or equivalent) from an accredited institution. 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 and/or business experience, and two letters of recommendation. An interview may be arranged at the request of the applicant. For detailed information, please contact the Director.

To meet the admissions requirements, students are required to complete the application and submit their official transcript(s), two letters of recommendation, and a resume.

Curriculum

The Emerging Leaders curriculum is cohort-style, with the same group of students remaining together throughout the entire program in a collaborative learning environment. No course waivers or transfer credits are granted in this program.

Students will begin their studies with 18

credits of core courses followed by 30 credits of advanced courses.

Modules

CO 620 Applied Communications
EC 601 Macroeconomics and Microeconomics
MK 609 Marketing
QA 604 Probability & Statistics
MG637 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 & Valuation
IB 644 Managing the Global Economy
A 621 Managerial Accounting
EC 629 Business & Society
MG 669 Strategic Management
MG 670 Selected Topics

Total credits: 48

Executive Master of Business Administration (Executive MBA)

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 MBA 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 MBA program. Admission is by a special application available from the Director. No GMAT is required.

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 applications for are available from the Office of the Executive MBA Director, Room 200, Echlin Hall, (203) 932-7386, or fax (203) 932-7261, or email: *lcarlone@newhaven.edu*.

Required Courses

The program consists of 18 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, with the exception of the two full days for the 2- credit Communication Process module. Participants must be prepared to attend all classes, except for emergencies. They must also be prepared to devote significant additional time for class preparation and reading assignments.

Modules

First Year
EXID 903 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

Total credits: 56

Public Administration (MPA)

Coordinator: Charles N. Coleman, Assistant Professor of Public Management, MPA, 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 organization;
- expose students to the wide range of administrative and managerial problems and responsibilities in the public sector
- 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 School of Business, Department of Public Management 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 consists of 42 graduate credit hours required of candidates for the MPA 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)

Total credits: 42

Concentration in City Management

The courses selected for this concentration will 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 will 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

Total credits: 15

Concentration in Community-Clinical Services

This concentration is designed to prepare 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 additional 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

Total credits: 12

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 health care concentration in lieu of their 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 649 History and Development of Health Care Institutions
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

Total credits: 15

See the Table of Contents for the MS degree in Health Care Administration, the MBA concentration in this field, 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's courses 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.

As shown below, 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.

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
One Health Care Elective

Total Concentration credits: 15
Total Program credits: 42

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
Two Health Care Electives
One Restricted Elective

Total Concentration credits: 18
Total Program credits: 45

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. In addition, the courses in this concentration will provide training for public administrators in areas such as employee motivation, organizational change, and group dynamics.

Students choosing this concentration will take the required core curriculum of nine courses and follow the personnel and labor relations concentration in lieu of their 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

Total credits: 15

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

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

Public Administration Dual Degree Program (MBA/MPA)

Coordinator: Charles N. Coleman, Assistant Professor of Public Management, MPA, West Virginia University

The MBA/MPA 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.

MBA/MPA Dual Degree

The MBA/MPA program consists of 75 credit hours. Up to 15 of these may be waived on the basis of undergraduate coursework, leaving a minimum requirement of 60 credit hours. All 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 Graduate School policy on transfer credit detailed elsewhere in this catalog. In all cases, the residency requirement for the two degrees shall be 60 credit hours completed at the University of New Haven. Within these 60 credit hours, a minimum of 21 must be earned in business courses and a minimum of 21 in public administration courses.

Project/Thesis Requirement

Students must choose one of two alternatives for completion of the final six credits of coursework in the MBA/MPA dual degree curriculum. Most students will 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 Graduate School policy on theses as well as all specific departmental requirements.

Required Courses

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)

Total credits: 75

**Up to five of the six Business Core Courses (not more than 15 credits) may be waived by students who meet the waiver guidelines established for these courses within the MBA program; see MBA program for information.*

Health Care Administration

Coordinator: Charles N. Coleman, Assistant Professor of Public Management, MPA, West Virginia University

This program of study, leading to the master of science degree, is designed to give 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, present, and future of health care administration. 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.

MS, Health Care Administration

A total of 42 graduate credit hours is required for completion of the master of science in health care administration. The program consists of nine required courses plus five additional courses which 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 credit hours of introductory statistics.

Required Courses

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 electives or concentration courses

Total credits: 42

**MS 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

Total credits: 15

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

Total credits: 15

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

Total credits: 15

Concentration in Long-Term Care

As shown below, 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.

Option I:

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

Total Concentration credits: 15
Total Program Credits: 42

Option II:

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

Total Concentration credits: 18
Total Program Credits: 45

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

Total credits: 15

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

Total credits: 15

In addition to the master of science program, health care concentrations are available in both the MBA and MPA programs, as are graduate certificates in the health care field. See Table of Contents to locate these other related programs.

Labor Relations

Coordinator: Charles N. Coleman, Assistant Professor of Public Management, MPA, 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 all 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 aimed at 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 but not an absolute necessity 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 admissions 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).

MS, Labor Relations

A total of 30 graduate credit hours is

required for completion of the master of science degree in labor relations. Of these, 21 credits (seven courses) are required courses, and 9 credits (three courses) are approved concentration/elective courses. 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)

Total credits: 30

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

Management of Sports Industries

Coordinator: Gil B. Fried, Associate Professor, Sports Management, JD, 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. Other graduate programs exist in non-business areas, but 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, including
  - 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 organiztions and companies such as ESPN and WWE.

Admission Policy

Candidates for admission are required to hold a four-year baccalaureate degree (or equivalent) from an accredited institution. 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 experience, and letters of recommendation. An interview may be arranged at the request of the applicant.

For detailed information, please contact the coordinator.

MS, Management of Sports Industries

A total of 36 credit hours 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 MBA 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

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 617 Applied Fiscal Management for Sports and Facility Managers
MG 618 College Sports Administration
MG 694 Internship (3-6 credits)
SH 602 Safety Organization and Administration
THM 920 Strategies for Event Planning

Total credits: 36

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 3,800^{+} members. The focus is on how to manage large public assembly facilities such as stadiums and arenas. Topics covered include such specialities 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, including MG 613 and a required internship (MG 694) designed 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 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

Total credits: 12

See the Table of Contents for the MBA concentration in management of sports industries and the certificate in management of sports industries.

Taxation

Coordinator: Robert E. Wnek, Professor of Tax Law, Accounting, and Business; BSBA, Villanova University; JD, Widener University School of Law; LLM, 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 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 CPAs, attorneys, and those holding an undergraduate degree from an accredited institution.

Admission is based primarily on an applicant's undergraduate record and work experience; the promise of academic success is the essential factor for admission.

MS, Taxation

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

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

Elective:
A 610 International Taxation
or A 611 State and Local Taxation

Total credits: 33

Graduate Certificates

The School of Business offers the following 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 yet be ready to commit themselves 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, plus 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 of Tax Law, Accounting, and Business; BSBA, Villanova University; JD, Widener University School of Law; LLM, 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.

Any four of the following:

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.

Total credits: 12

**Prerequisite is A630 or two undergraduate intermediate accounting courses.*

Business Management Certificate

Advisor: Gil B. Fried, Associate Professor, Sports Management, JD, Ohio State University

This certificate is designed to develop 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 organizational effort in our ever-changing economic environment. Prerequisites are required for some of the courses in the certificate; 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 Organization 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.

Total credits: 12

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

Finance Certificate

Advisor: Steven J. Shapiro, Associate Professor of Economics and Finance, PhD, Georgetown University

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 the 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

Total credits: 12

Health Care Management Certificate

Advisor: Charles N. Coleman, Assistant Professor of Public Management, MPA, West Virginia University

This certificate will be useful for professionals and decision makers employed in the public, private, or nonprofit sectors of the health care field. Coursework will provide 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 649 History and Development of Health Care Institutions
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

Total credits: 12

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

Human Resources Management Certificate

Advisor: Gil B. Fried, Associate Professor, Sports Management, JD, Ohio State University

This certificate is designed for the human resources professional or the individual in an

allied field who aspires to increase his/her 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
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.

Total credits: 12

International Business Certificate

Advisor: Ben B. Judd, Professor of Marketing, PhD, University of Texas at Arlington

This certificate is designed to prepare 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
IB 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

Total credits: 12

Long-Term Health Care Certificate

Advisor: Charles N. Coleman, Assistant Professor of Public Management, MPA, 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 course of study 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 as shown below. Please contact the Program Coordinator prior to selecting an option, as the State of Connecticut has different requirements for each option.

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

Total credits: 12

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 three-credit health care elective

Total credits: 12

Management of Sports Industries Certificate

Advisor: Gil B. Fried, Associate Professor, Sports Management, JD, Ohio State University

This certificate is designed 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 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.

Total credits: 12

Marketing Certificate

Advisor: Ben B. Judd, Professor of Marketing, PhD, University of Texas at Arlington

The certificate in marketing allows 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 Marketing Management and 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

Total credits: 12

Public Administration Certificate

Advisor: Charles N. Coleman, Assistant Professor of Public Management, MPA, West Virginia University

This certificate is designed to provide training at the graduate level for people in public service. Coursework 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
PA630 Fiscal Management for Local Government
or PA 632 Public Finance and Budgeting

Total credits: 12

Public Management Certificate

Advisor: Charles N. Coleman, Assistant Professor of Public Management, MPA, West Virginia University

This certificate is designed to provide a broad overview of 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

Total credits: 12

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

Total credits: 12

Taxation Certificate

Advisor: Robert E. Wnek, Professor of Tax Law, Accounting, and Business; BSBA, Villanova University; JD, Widener University School of Law; LLM, Boston University School of Law; CPA

This certificate is for 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.

Total credits: 12

Telecommunication Management Certificate

Advisor: Jerry L. Allen, Professor of Communication, PhD, Southern Illinois University at Carbondale

This certificate is designed to prepare 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

Total credits: 12

**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.*

TAGLIATELA SCHOOL OF ENGINEERING

Zulma R. Toro-Ramos, BS, MS, PhD, Dean

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 School of Engineering is to prepare individuals for professional practice in diverse engineering areas, computer science, and chemistry. In addition, the School 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, operations research, and executive engineering management (EMSEM).

A dual degree program combines the master's in business administration (MBA) with the master of science in industrial engineering. Graduate certificates are offered in civil engineering design, computer applications, computer programming, computing, logistics, and quality engineering.

At the undergraduate level, the School offers bachelor's degrees in chemistry, computer engineering, information technology, and general engineering along with its five bachelor's degrees in chemical, civil, electrical, industrial, 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 program in computer science, accredited by the Computing Accreditation Commission of the Accreditation Board for Engineering and Technology (CAC/ABET).

Computer Science

Coordinators

Graduate Advisor:

Barun Chandra, Associate Professor of Computer Science, PhD, University of Chicago

Graduate Admissions Coordinator:

Tahany Fergany, Professor of Computer Science, PhD, 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 this. The program can be used to enter, or advance in, the computing profession or an allied field, along a variety of career paths. It may also be used to prepare 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. All applicants will be expected to demonstrate that they have completed a baccalaureate degree and a course in college algebra prior to enrolling in the program. Submission of GRE scores is not required.

MS, Computer Science

Students with an adequate background in computer science will complete 30 credit hours of coursework consisting of 9 credits of distribution courses, 9 of concentration courses, and 12 of elective courses. In addition, within these 30 credit hours of coursework, 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 credit hours 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 who seek a waiver must submit a petition form along with supporting documentation to the Coordinator before or during the student's first trimester. Only courses with grades of "B-" or better may be used for waiver purposes. Students are expected to complete the core courses soon after joining the program; until all core courses have been either waived or successfully 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. However, this is subject to the university's 30-credit residency requirement, so students have to complete a minimum of 30 credit hours at the University of New Haven.

The curriculum is being updated constantly. The most up-to-date version of the program can be obtained from either one of the graduate coordinators.

Placement Policy

Students will be placed in the programming sequence by the graduate coordinators. Those with sufficient prior experience in C programming might start in CS 610 or CS 620. A beginning programmer must start with CS 604, which is a prerequisite to the core and can be counted as the student's single free elective.

Additionally, new students should take CS 630 and CS 640 at the start of the program since these are core courses with no prerequisites.

Before enrolling in any course, students must make sure that they meet all the prerequisites for that course (as specified in the course description), either by courses taken as part of the program or by work done outside the program.

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

Required Courses (not waivable)

Distribution Courses (9 credits)

Each student will select one course from each of the following three categories:

Software Design Methodology Distribution Courses (choose one)

CS 623 Rapid Software Development/ Visual Basic
CS 626 Object-Oriented Principles and Practice/C++
CS 628 Object-Oriented Analysis and Design

Theory and Analysis Distribution Courses (choose one)

CS 633 Topics in Algorithms
CS 634 Cryptography and Data Security
CS 636 Structure of Programming Languages
CS 660 Artificial Intelligence

Computer Systems Distribution Courses (choose one)

CS 616 Assembly Language
CS 640B Parallel Computer Architectures
CS 642 Computer Networks and Data Communication
CS 644B Distributed Operating Systems
CS 647 Systems Programming

Concentration Courses and Project Requirement (9 credits)

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

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

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. Suggested courses for this purpose include: CS 617, CS 622B, CS 623, CS 626, CS 628, CS 640B, CS 642, CS 644B, CS 647, CS 650, CS 655, CS 657, CS 660, and CS 665.

If a student is doing the CS 690 Project course, it will count as a concentration course in addition to satisfying the project requirement. Students who plan to do the CS 690 Project must find a project advisor, prepare a project proposal, and obtain written approval for the project prior to registration.

Concentration Course Areas

Software Development Concentration

CS 617 Java Programming
CS 623 Rapid Software Development/ Visual Basic
CS 625 Software Project Management
CS 626 Object-Oriented Principles and Practice/C++
CS 628 Object-Oriented Analysis and Design
CS 690 Project

Database and Information Systems Concentration

CS 622 Database Systems
CS 622B Advanced Database Systems
CS 623 Rapid Software Development/ Visual Basic
CS 625 Software Project Management
CS 627 Distributed Database Systems
CS 645 Network Administration
CS 655 Internet Applications with Java
CS 690 Project

Computer Systems Concentration

CS 616 Assembly Language
CS 640B Parallel Computer Architectures
CS 642 Computer Networks and Data Communication
CS 644B Distributed Operating Systems
CS 647 Systems Programming
CS 690 Project
EE 615 Introduction to Computer Logic
EE 658 Embedded Applications

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

Network Systems Concentration

CS 617 Java Programming
CS 634 Cryptography and Data Security
CS 642 Computer Networks and Data Communication
CS 645 Network Administration
CS 646 Introduction to Computer Security
CS 649 Network Analysis
CS 655 Internet Applications with Java
CS 690 Project

Electives (12 credits)

At least three of the elective courses must be chosen from the list of Restricted Elective courses. The fourth elective course may be either a Restricted or a Free Elective.

Restricted Electives

The Restricted Elective courses include all the Distribution courses and all the Concentration courses. Some CS 670 Selected Topics courses may also be designated as Restricted Electives on a case-by-case basis.

Important Note: The Core courses are not Restricted Electives. In addition, CS 601, CS 604, and Internships are not Restricted Electives, but they may be counted as a student's one Free Elective.

The following are also Restricted Electives:

IE 601 Introduction to Operations Research/ Management Science
IE 607 Probability Theory
IE 609 Descriptive and Inferential Statistics
IE 621 Linear Programming
IE 622 Queueing 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 School of Engineering or in the School of Business. A student who wants to take a Free Elective course other than those indicated here must obtain prior 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, within the above program requirements, at least one of the courses in the Programming Languages group listed below or (2) by submitting prior work (subject to the approval of the graduate advisor) which demonstrates that the student knows a programming language other than C.

Programming Language Courses

CS 616 Assembly Language
CS 617 Java Programming
CS 623 Rapid Software Development/ Visual Basic

Total credits: 48

Electrical Engineering

Coordinator: Bouzid Aliane, Professor, Electrical and Computer Engineering, PhD, Polytechnic Institute of New York

The Department of Electrical and Computer Engineering's program leading to the degree of Master of Science in Electrical Engineering (MSEE) is designed to provide students and practicing engineers alike with the technical background for analysis, design, development, or research on electrical and computer engineering systems in a spectrum of professional skills. 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. Areas of research expertise and study at the graduate level include communications, control, digital signal processing, digital system design and simulation, microprocessor systems, optical sensors, embedded computing, computer engineering, computer architecture, computer networks, fuzzy systems, VLSI design, and many other relevant subareas of electrical and computer engineering.

Admission Policy

To be eligible for admission, a student must have an undergraduate degree from a program accredited by the Accreditation Board for Engineering and Technology (ABET), or its equivalent, showing a strong record with a "B" average or better. In some instances, students who do not meet the above criteria may be considered for admission on the basis of evaluation of their current status, goals, and potential for success in the program. Such students may be admitted subject to making up deficiencies in their undergraduate studies.

Applicants are urged to submit Graduate Record Examination (GRE) scores to provide additional information for the admissions decision. Two letters of recommendation (professional or academic) from individuals familiar with the applicant's potential for graduate study are also required as well as official transcripts of undergraduate work completed.

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.

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 departmental 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) within the elective portion of the program. 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 under-

standing of research. One copy of the final draft must be submitted to the graduate coordinator.

MS, Electrical Engineering

A total of 36 graduate credit hours beyond the baccalaureate degree must be completed to earn the Master of Science in Electrical Engineering.

The degree is structured into two options: electrical engineering and computer engineering. Candidates must complete the specific requirements for the option they select. 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 designed for students who wish to focus their study in communication systems, control systems, digital signal processing, optical sensors, or fuzzy systems. In addition to the four required courses, eight electives are chosen in consultation with the student's advisor or program coordinator.

Required Courses

One mathematics course*

Plus the following:

EE 603 Discrete and Continuous Systems I
EE 604 Discrete and Continuous Systems II
EE 650 Random Signal Analysis
Approved Electives (eight courses)

Total credits: 36

**Selection of the required mathematics course must be made with the approval of the program coordinator. M 611 Matrix Theory and Its Applications is strongly recommended. Students may not take M 610 or M 616 for credit in this degree option.*

Elective courses

CS 640B Parallel Computer Architecture
CS 650 Computer Graphics
CS 664 Neural Networks
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 690 Research Project
EE 695 Independent Study
EE 697/698/699 Thesis I, II, and III
M 611 Matrix Theory and Its Applications
M 615 Linear Mathematics and Combinatorics

With the approval of the program coordinator or the 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.

Option II: Computer Engineering

This option is designed primarily to serve those students who wish to obtain advanced knowledge in the applications of electrical engineering principles to the design of computer-based systems. Working electrical engineers with BSEE degrees find an increasing amount of their professional time 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. The computer engineering option seeks to help these engineers cope with this shift by offering more graduate work in the computer engineering area under the MSEE degree program.

Required Courses*

CS 620 Data Structures
CS 644 Operating Systems
EE 610 Networking I
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

Elective Courses***

Four electives from ECE or CS Department

Total credits: 36

**Required courses may be replaced by other courses if a student can demonstrate equivalent knowledge.*

***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.*

****Elective courses must be taken with the approval of the program coordinator or the academic advisor. Elective courses may be taken from other departments with the approval of the MSEE coordinator or the academic advisor. CS 610 or any other introductory course in C cannot be used as an elective. Students with deficiency in this area must take CS 610 in addition to the regular coursework for the computer engineering option in the MSEE program.*

Elective Courses

CS 640B Parallel Computer Architecture
CS 650 Computer Graphics
CS 664 Neural Networks
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 658 Embedded Applications
EE 670 Selected Topics
EE 680 Fiber Optic Communications
EE 681 Lightwave Technology
EE 685 Optimization of Engineering Systems
EE 690 Research Project
EE 695 Independent Study
EE 697/698/699 Thesis I, II, and III
M 611 Matrix Theory and Its Applications
M 615 Linear Mathematics and Combinatorics

With the approval of the program coordinator or academic advisor, students may select other courses in mathematics, engineering, physics, or computer science.

Environmental Engineering

Coordinator: Agamemnon D. Koutsospyros, Professor of Civil and Environmental Engineering, PhD, 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 increased 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. A wide array of employment opportunities exists 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 developments.

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 coursework 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 from a program with a demonstrated equivalent accreditation. Applications from candidates with an ABET-accredidated 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 and students with nonengineering undergraduate degrees will not be considered candidates for admission. However, a potential candidate who does not meet the admission criteria may, in consultation with and with the approval of the department chairperson, pursue a program of study which may include 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.

MS, Environmental Engineering

A total of 39 credit hours, 12 three-credit courses plus a three-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 courses, other than those listed below as approved non-environmental engineering electives, requires approval of the program coordinator. Transfer credit from other institutions will be 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)

Total credits: 39

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 who will assist the student in formulating a program of study and identifying an appropriate research project.

Concentration in Water Resources

Concentration Advisor: Jean Nocito-Gobel, Assistant Professor of Civil and Environmental Engineering, PhD, 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)

Total credits: 39

Concentration in Water and Wastewater Treatment

Concentration Advisor: Agamemnon D. Koutsospyros, Professor of Civil and Environmental Engineering, PhD, 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)

Total credits: 39

Concentration in Industrial and Hazardous Wastes

Concentration Advisor: Agamemnon D. Koutsospyros, Professor of Civil and Environmental Engineering, PhD, 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)

Total credits: 39

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.*

Executive Master of Science in Engineering Management (EMSEM)

Coordinator: Zulma R. Toro-Ramos, Professor of Industrial Engineering and Dean, Tagliatela School of Engineering, PhD, Georgia Institute of Technology

This program provides technical professionals with the knowledge and skills they need to be successful today. 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, EMSEM 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. EMSEM is specifically designed to provide this.

Admission Policy

Application for admission may be made to the UNH Graduate School. Qualified applicants should hold a bachelor's degree from an accredited institution, or the 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.

An 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 School of Engineering, makes final decisions on admission.

Applicants to the program must be suitably qualified for both the EMSEM courses (EXIE) and the five Executive MBA 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 and/or meet certain academic conditions before enrollment in that course is permitted. The nature of an executive 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.

Executive MS, Engineering Management

The EMSEM program consists of 18 modules 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 will be scheduled each academic year, each module running for five consecutive weeks on a given weekday for six hours, usually from 2:30 - 8:30 p.m. An EMSEM class will generally meet 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, all papers must receive approval by the EMSEM program coordinator or academic advisor.

Modules

EXIE 901 Engineering Management Concepts
EXIE 902 Managing Uncertainty
EXIE 903 Statistics for Quality and Engineering Management
EXIE 957 Organizational Change & 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 & 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

Total credits: 54

Industrial Engineering

Coordinator: Alexis N. Sommers, Professor of Industrial Engineering, PhD, Purdue University

The program is intended to meet the needs of professionally employed engineers working in an environment where cost effectiveness, high productivity, and effective use of resources are crucial. It has been designed to give the student an advanced level of training beyond the baccalaureate, sufficient to prepare for a leadership role in industry.

The program centers on a core sequence required of all students. It contains courses in analysis and design considered to be of common interest to all industrial engineers of advanced professional standing. (See the notes which follow regarding waivers related to these core courses.) Students complete the program by choosing elective courses in operations research, human factors, manufacturing engineering, computer science, or other areas particularly suited to their professional interests and needs. Once the student and the student's advisor have agreed on these electives, they shall become part of the student's program of study. All subsequent changes in electives must be made with the advisor's advance written consent.

Admission Policy

Candidates for admission to the program are expected to hold an undergraduate degree in engineering from a program accredited by the Accreditation Board for Engineering and Technology, or demonstrated equivalent. In some cases, an applicant with a degree in a related field may be considered for admission. Students entering the program are expected to be competent in mathematics through calculus. Those with insufficient mathematics background will be 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 may be required to take other graduate courses that serve as appropriate prerequisites.

Though admission decisions are based primarily on an applicant's undergraduate record, the promise of academic success is the essential factor.

MSIE

The program consists of 45 credit hours. The transfer of credit from other institutions will be permitted subject to Graduate School policy on transfer credit detailed elsewhere in this catalog. Required courses may be waived on the basis of undergraduate courses taken at accredited institutions. All waivers must be approved in writing by the department of industrial engineering and are contingent upon subsequent academic performance. In some cases, the program coordinator may permit substitution of relevant courses in place of the required courses.

Research Project/ Thesis Requirement

All students in the program will complete a thesis or an appropriate special project which will partially fulfill the elective requirements for the degree. The special project requirement will usually be satisfied by taking a research project course in a group setting. A designated area of study may be indicated for each such research project course; in these cases, the instructor will offer direction in the area and will assist students in the development of substantial individual projects. Particular requirements or prerequi-

sites may be set for the course or for those intending to complete a project. In appropriate cases having special approval, a student may elect to write a thesis or take a research project course (as listed in the catalog) on an individual basis.

Required 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 686 Production and Inventory Analysis
IE 688 Design of Experiments
Approved Electives (five courses, including project/thesis)

Total credits: 45

Industrial Engineering Dual Degree Program (MBA/MSIE)

Coordinator: Alexis N. Sommers, Professor of Industrial Engineering, PhD, 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 this 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 will be 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 will be required to take a number of undergraduate courses or otherwise demonstrate proficiency in several areas normally included in an undergraduate industrial engineering program.

Applicants are required to meet the requirements outlined in the admissions policy sections of each of the relevant degree programs.

MBA/MSIE Dual Degree

The MBA/MSIE program consists of 69 credit hours. Up to 9 of these credit hours may be waived on the basis of undergraduate coursework, leaving a minimum requirement of 60 credit hours. Any waiver(s) of coursework from the MBA side of the curriculum must meet the waiver guidelines of the MBA program. All 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.

In all cases, the residency requirement for the two degrees shall be 60 credit hours completed at the University of New Haven.

Project/Thesis Requirement

All students in the dual degree program must complete the required business administration capstone course MG 669 Strategic Management. In addition, all dual degree students 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 such industrial engineering project course; in these cases, the instructor will offer direction in the area and will assist students

in the development of substantial individual projects. Particular requirements or prerequisites may be set for the course or for those intending to complete a project. In appropriate cases having special approval, a student may take a research project or thesis (as listed in the catalog) on an individual basis.

Required Courses

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 686 Production and Inventory Analysis
IE 688 Design of Experiments
Approved IE Electives (two courses, including IE thesis/project)

Total credits: 69

**Up to three of the five Business Core Courses (not more than 9 credits) may be waived by students who meet the waiver guidelines established within the MBA program.*

Mechanical Engineering

Coordinator: Konstantine C. Lambrakis, Professor of Mechanical Engineering, PhD, Rensselaer Polytechnic Institute

This program is intended to meet the needs of professionally employed engineers and scientists for academic work beyond the baccalaureate level. Its purpose is to increase competence in modern analysis and synthesis techniques as these 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 which 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, with the approval of the advisor, prepare a detailed plan ensuring an overall educational experience that is integrated and logical.

All decisions regarding both core and elective requirements are subject to final approval by the student's advisor.

Admission Policy

Candidates for admission to the master's program are normally expected to have a grade average of "B" or better in their undergraduate coursework 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.

MSME

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 in depth particular areas of interest under the guidance of a faculty member. Thesis topics should be approved by the faculty advisor when the student has completed 18 graduate credits. Students should contact the coordinator for thesis advisors in these specialized areas: acoustics/aerodynamics, fluids/biomechanics, gas dynamics, heat transfer/thermodynamics, applied mechanics/optics, systems analysis/machine design/random vibrations/numerical analysis, solid mechanics/computer-aided design. Thesis preparation and submission must comply with Graduate School policy on theses as well as with all specific departmental requirements.

If a thesis is not chosen, and unless a major special project approved by the graduate program coordinator is completed within the scope of other mechanical engineering courses, a student will be required to undertake a three- or six-credit project, on an independent study basis, supervised by a full-time faculty member in the department of mechanical engineering.

Required Courses*(15 credits)

ME 602 Mechanical Engineering Analysis
ME 610 Advanced Dynamics
ME 615 Theory of Elasticity
ME 620 Classical Thermodynamics
ME 630 Advanced Fluid Mechanics

Elective Courses(18 credits)**

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

Total credits: 33

**With the coordinator's written approval, one of the required courses may be waived depending on the student's academic background.*

***With the coordinator's written approval, three of the elective courses may be taken in departments other than mechanical engineering.*

Operations Research

Coordinator: Alexis N. Sommers, Professor of Industrial Engineering, PhD, Purdue University

Operations research has become an important professional discipline in recent years. Complex technical problems have been examined and solved using advanced mathematical techniques and computers. The master of science in operations research curriculum provides thorough coverage of the theory, methodology, and application of these techniques. The program is designed to prepare qualified applicants with solid mathematics training—but from otherwise diverse backgrounds—to deal with important industrial, business, commercial, and governmental problems.

The program centers on a sequence of core courses recognized to be of common interest to all operations research practitioners of advanced professional standing. Students

complete the program by choosing elective courses in operations research, computer science, mathematics, or other areas particularly suited to their professional interests and needs. Once the student and an advisor have agreed to these electives, they shall become a part of the student's program of study. All subsequent changes in electives must be made with the advisor's advance written consent.

MS, Operations Research

The program consists of 42 credit hours. Entering students are expected to be competent in mathematics through calculus. Those with insufficient mathematics background will be required to take approved mathematics courses (e.g., M 610 Fundamentals of Calculus) outside/in addition to the program requirements. The transfer of credit from other institutions will be permitted subject to Graduate School policy on transfer credit detailed elsewhere in this catalog. Required courses may be waived on the basis of undergraduate courses taken at accredited institutions. All waivers must be approved in writing by the program coordinator and are contingent upon subsequent academic performance. In some cases, the coordinator may permit substitution of relevant courses in place of required courses.

Research Project/ Thesis Requirement

All students in the program will complete a thesis or an appropriate special project which will partially fulfill the elective requirements for the degree. The special project requirement will usually be satisfied by taking a research project course in a group setting. A designated area of study may be indicated for each such research project course; in these cases, the instructor will offer direction in the area and will assist students in the development of substantial individual projects. Particular requirements or prerequisites may be set for the course or for those intending to complete a project. In appropriate cases having special approval, a student may elect to write a thesis or take a research project course (as listed in the catalog) on an individual basis.

Required Courses

IE 601 Introduction to Operations Research/Management Science
IE 607 Probability Theory
IE 609 Descriptive and Inferential Statistics
IE 621 Linear Programming
IE 622 Queueing Theory
IE 625 Advanced Mathematical Programming
IE 681 System Simulation
IE 685 Theory of Optimization
IE 687 Stochastic Processes
IE 688 Design of Experiments
Approved Electives (four courses, including project/thesis)

Total credits: 42

Graduate Certificates

The Tagliatela School of Engineering offers the following 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 yet be ready to commit themselves 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 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 of Civil and Environmental Engineering, 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 are construction, geotechnical engineering, hydraulics and hydrology, and structural 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

Total credits: 12

Computer Applications Certificate

Coordinators
Graduate Advisor:
Barun Chandra, Associate Professor of Computer Science, PhD, University of Chicago
Graduate Admissions Coordinator:
Tahany Fergany, Professor of Computer Science, PhD, University of Connecticut

CS 610 Intermediate Programming/C
CS 620 Data Structures

Plus two of the following:

CS 617 Java Programming
CS 622 Database Systems
CS 622B Advanced Database Systems
CS 623 Rapid Software Development/Visual Basic
CS 627 Distributed Database Systems
CS 634 Cryptography and Data Security
CS 650 Computer Graphics
CS 655 Internet Applications with Java
CS 657 Programming Window Systems
CS 660 Artificial Intelligence
CS 663 Mobile Robotics
CS 665 Digital Image Processing

Total credits: 12

Computer Programming Certificate

Coordinators
Graduate Advisor:
Barun Chandra, Associate Professor of Computer Science, PhD, University of Chicago
Graduate Admissions Coordinator:
Tahany Fergany, Professor of Computer Science, PhD, 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 616 Assembly Language
CS 617 Java Programming
CS 623 Rapid Software Development/ Visual Basic
CS 626 Object-Oriented Principles and Practice/C++
CS 647 Systems Programming

Total credits: 12

Computing Certificate

Coordinators
Graduate Advisor:
Barun Chandra, Associate Professor of Computer Science, PhD, University of Chicago
Graduate Admissions Coordinator:
Tahany Fergany, Professor of Computer Science, PhD, University of Connecticut

CS 610 Intermediate Programming/C

Plus any three Computer Science Restricted Electives from the list in the description of the MS Computer Science program.

Total credits: 12

Logistics Certificate

Advisor: Alexis N. Sommers, Professor of Industrial Engineering, PhD, Purdue University

This certificate provides a basic working knowledge of logistics in all sectors, 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 repairmen 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

Total credits: 12

Other logistics/related courses may be substituted with the approval of the certificate advisor.

Quality Engineering Certificate

Advisor: Alexis N. Sommers, Professor of Industrial Engineering, PhD, Purdue University

This certificate is designed to provide qual-

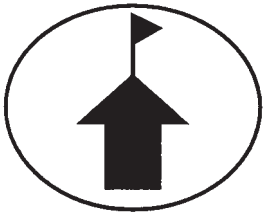
ity and reliability professionals who are interested in advancing their knowledge and skills with the most up-to-date analytic techniques and standards in the areas of quality assurance and control, reliability engineering, and experimental design. The program provides a solid foundation in probability 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 covering factorial and Taguchi methods. The courses taken for this certificate are applicable toward the MS in Industrial Engineering and the MS in Operations Research programs.

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

Total credits: 12



SCHOOL OF HOSPITALITY AND TOURISM

Jess S. Boronico, PhD, Dean

An executive master of science degree in tourism and hospitality management is offered through the Graduate School by the School of Hospitality and Tourism.

The graduate curriculum is designed for those who have managerial or operational experience in the tourism/hospitality industry. One goal of the program is to provide an avenue for students with industry experience to further their education at the graduate level while remaining on the job. Students may enroll in the program full-time or part-time.

Courses focus on leadership, communication, customer service, marketing, and operations issues unique to tourism/hospitality organizations. Courses stress managing change within a global context and recognizing the needs of operating with a workforce that is culturally diverse, in an increasingly technology-driven environment.

Undergraduate degree programs are offered in hotel/restaurant management, with an optional concentration in tourism, and in tourism administration.

Executive Master of Science in Tourism and Hospitality Management

Coordinator: James J. Murdy,
Assistant Professor, Tourism Administration, PhD, University of Connecticut

The executive master of science in tourism and hospitality management is a fully accredited, graduate-level degree program designed for full-time or part-time study. Courses are scheduled to suit the time constraints and responsibilities imposed by students' careers.

Key issues facing the hospitality industry include increasing global competition, changing markets, rising costs, and the diversity of labor sources. As a result, the need for accomplished managers is greater than ever before.

Tourism is an integral economic, social, and cultural component of global, national, and community development. The rise of tourism as an activity and an economic force has caused an increase in demand by the private sector for highly educated executives. In recognition of the importance of tourism and of the need for advanced study in the field, the executive master's program provides courses in resource development and management at travel destinations, in business and leisure travel markets, in philosophy of service, in human resource management, in marketing, and in financial issues. These and other courses explore the needs and desires of different travel markets, the dimensions of international tourism, and the impacts of tourism and hospitality. Current information is available from the program coordinator at 203-932-7413 or 1-800-Dial-UNH, ext. 7413.

Program Goals

The goal of the program is to provide students with tools that enable them to manage change. Structural changes in society demand that hospitality and tourism executives be able to manage successfully in a workplace that is culturally diverse and technologically advanced. Graduates of the program are capable of translating theory into reality, of creating an atmosphere in which employees are motivated to provide the highest levels of quality service in a professional manner, and of communicating with a multicultural workforce and a demanding clientele.

Individual participation is emphasized through discussions, interaction, and cooperation with other executives. Each class progresses through the program as a group, thus providing an opportunity for the continuing exchange of ideas and information. Prospective candidates are encouraged to apply as early as possible due to enrollment limitations. New classes begin in September and January of each year.

Admission Policy

Applicants are required to hold a four-year baccalaureate degree, or the equivalent, from an accredited institution. No transfer credit is accepted to the executive master's program. Corporate-sponsored applicants are required to provide an organizational letter of support.

The faculty of the School of Hospitality and Tourism seeks applicants with strong academic ability, high motivation, professional experience, and an aptitude for graduate-level work. Admission decisions are based on an evaluation of all material submitted in support of the application: two letters of recommendation, official transcripts of all previous undergraduate and graduate coursework, tourism and hospitality work experience, and official test scores on the Graduate Record Examination (GRE) General Test, the Graduate Management Admissions Test (GMAT), or the Miller Analogies Test (MAT).

In addition to the above criteria for admission, international students from countries where English is not the official language

must demonstrate proof of English proficiency as described elsewhere in this catalog.

Documentation of relevant professional experience and other supporting information may be required before a final admission decision is made.

Program Requirements

All students without an appropriate undergraduate degree (i.e., hotel, restaurant, travel, tourism, recreation, leisure, hospitality) may be required to take additional undergraduate courses in order to satisfy prerequisites.

Internships

There are many opportunities in the Connecticut/New York area for intern experiences in government agencies, private-sector firms, and non-governmental organizations. Internships are provided through the assistance and guidance of the school's internship coordinator. The intern experience is directly related to the student's academic program and of an appropriate professional level. Internships may be paid or unpaid and are expected to be 300 hours in length.

Program Options

Students choose between two options: 1) a 30-credit program consisting of 10 three-credit courses, 2) or a 48-credit program that includes a research component with a thesis research project. All classes meet one afternoon/early evening per week. Participants must agree in advance to attend all classes except for emergencies. Students must be prepared to devote significant additional time to class preparation and reading assignments.

Required Courses

THM 901 Orientation and Communication
THM 902 Philosophy of Service and Operations Strategy
THM 903 Organizational Development and Human Resource Strategies
THM 904 Dimensions of Tourism in the Global Marketplace
THM 905 National and International Strategic Marketing for Senior-Level Management
THM 906 Financial Resource Development and Preservation
THM 907 Law and Taxation for Profit/Non-Profit Organizations
THM 908 Government-Business Relations and Ethics
THM 909 Leadership and Problem Solving
THM 910 Special Topics: Current Issues/Future Trends

Total credits: 30

Research Concentration

The master's program in executive tourism and hospitality management with research concentration is designed for those who have significant managerial or operational experience in the tourism/hospitality industry and who desire full-time graduate study with the more traditional research requirements. Full-time students in the research concentration will take the 10 three-credit modules along with their cohort group, plus an additional 18 credits of research and elective courses selected from the graduate curricula. A total of 48 credits plus a thesis research project is required for completion of the master's program with research concentration.

Required Courses

THM 901 Orientation and Communication
THM 902 Philosophy of Service and Operations Strategy
THM 903 Organizational Development and Human Resource Strategies
THM 904 Dimensions of Tourism in the Global Marketplace
THM 905 National and International Strategic Marketing for Senior-Level Management
THM 906 Financial Resource Development and Preservation
THM 907 Law and Taxation for Profit/Non-Profit Organizations
THM 908 Government-Business Relations and Ethics
THM 909 Leadership and Problem Solving
THM 910 Special Topics: Current Issues/Future Trends
QA 604 Probability and Statistics
Research Methodology Course
Elective (3 credits)
Elective or Internship
THM 912/THM 913 Research Project I & II

Total credits: 48

With approval of the program coordinator, three credits of electives may be taken as an internship.

SCHOOL OF PUBLIC SAFETY AND PROFESSIONAL STUDIES

Thomas A. Johnson, DCrim, Dean

Through the Graduate School, the School of Public Safety and Professional Studies offers career-oriented graduate degree programs in criminal justice, fire science, forensic science (including the criminalistics laboratory program), industrial hygiene, occupational safety and health management, and national security and public safety. In addition, a wide range of graduate certificates is available in the same fields 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.

In addition to the graduate programs at the main campus in West Haven, the university is authorized to offer master of science degrees in national security and public safety and in forensic science with a concentration in advanced investigation or fire science at its California locations in Sacramento and at the UNH Sandia Laboratory Campus in Livermore. Graduate certificates in these two areas, plus a certificate in forensic computer investigation, are also available at the California sites. 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.

Safety and professional degree programs and certificates also are offered at the undergraduate level in most of the same fields, along with a program in legal studies.

Criminal Justice

Coordinator: William M. Norton, Professor of Criminal Justice; PhD, Florida State University; JD, University of Connecticut Law School

A key objective of the master of science in criminal justice program is the education of men and women planning careers in the field of criminal justice as well as the advanced training and education of 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.

MS, Criminal Justice

A total of 36 credit hours is required for the degree of master of science in criminal justice. Some students will also be 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.

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

Thesis or Comprehensive Examination

Students may elect to undertake a thesis project for partial fulfillment of the requirements for the degree. Registration for a minimum of six thesis credits (CJ 697 and CJ 698) is 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 Graduate School policy on theses as well as all specific departmental requirements. Detailed information concerning these requirements 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 will be 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.

Required Courses—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)

Total credits: 36

As an alternative to the program listed above, a student may select one of the following concentrations. However, all students must complete the four core curriculum 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

There are optional concentrations —forensic psychology, criminal justice management, forensic computer investigation, crime analysis, and victimology — from which students may choose more specialized programs of study. 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 Forensic Psychology

This program, offered jointly by the departments of criminal justice and psychology, is designed 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
CJ 693 Criminal Justice Internship I*

Concentration Courses

CJ 623 Mental Health Law
CJ 646 Abnormal Psychology in Forensic Settings
CJ 647 Forensic Assessment
CJ 648 Forensic Treatment Models
P 605 Survey of Community Psychology
P 611 Individual Intervention Seminar*
P 628 The Interview
P 629 Introduction to Psychotherapy and Counseling

Total credits: 36-39

*CJ 693 Criminal Justice Internship I is required for students who do not have experience working with clients in a counseling setting. It is to be taken prior to or in the same term as P 611 Individual Intervention Seminar.

Concentration in Criminal Justice Management

This concentration is designed for those wishing to pursue a career in the management of a criminal justice agency. Courses are offered jointly by the criminal justice and the 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)

Total Credits: 36

Concentration in Forensic Computer Investigation

This concentration is designed 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 courses)

CJ 606 Domestic and Sexual Violence
CJ 608 Law and Evidence
CJ 614 Survey of Forensic Science
CJ 616 Advanced Crime Scene Investigation
CJ 632 Advanced Investigation I
CJ 633 Advanced Investigation II
CJ 651 Criminal Procedure
CJ 657 Crime Mapping and Analysis

Total credits: 36

Concentration in Crime Analysis

The concentration in crime analysis is designed to prepare 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 Environment Design
CJ 656 Problem Oriented Policing
CJ 657 Crime Mapping and Analysis
CJ 690 Research Project in CJ
E 659 Writing and Speaking for Professionals
EN 640 Introduction to Geographical Information Systems

Restricted Electives—two courses (six credits)

Total Credits: 36

Concentration in Victimology

This concentration provides students with an interdisciplinary, practice-oriented pro-

gram. 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
CJ 693 Criminal Justice Internship I*
P 611 Individual Intervention Seminar*

Approved Electives (three courses)*

Total credits: 36

*CJ 693 Criminal Justice Internship I is to be taken prior to or in the same term as P 611 Individual Intervention Seminar. Students may be required and/or approved to take CJ 694 Criminal Justice Internship II based on experience, ability, and background. With the approval of the advisor, students choosing the Thesis Option will utilize CJ 698/699 Thesis I/II for two courses (6 credits) of the Free Elective portion of the program.

Fire Science

Director: Robert E. Massicotte, Jr., Assistant Professor of Fire Science, MS, University of New Haven

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 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.

In addition to the graduate fire science program at the main campus in West Haven, the university is authorized to offer the master of

science in fire science at its California location in Riverside. Graduate certificates in fire science are also available at the California site. 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.

MS, Fire Science

Candidates are required to complete a minimum of 39 credit hours of graduate work, which may include an internship in fire science. Transfer credit from other institutions may be permitted subject to Graduate School policy on transfer credit detailed elsewhere in this catalog.

Students in the fire science degree program are required to complete the required core courses; a concentration in fire administration, fire/arson investigation, fire science technology, or public safety management; and 18 credits of electives. Students must take either FS 690 Research Seminar or FS 693 Internship. A six-credit thesis may replace one elective and the research seminar or internship requirement.

Students electing to write a thesis must register for thesis credit with the department. The thesis must show the ability to organize material in a clear and original manner and to present well-reasoned conclusions. Thesis preparation and submission must comply with Graduate School policy on theses as well as specific departmental requirements.

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)

Total credits: 39-40

Concentration in Fire Administration

One Computer Science (CS) Elective
MG 637 Management Process
Two Public Administration (PA) Electives

Total credits: 12

Concentration in Fire/ Arson Investigation

CJ 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

Total credits: 13

Concentration in Fire Science Technology

FS 661 Systems Approach to Fire Safety
FS 663 Fire Protection Systems Application
FS 666 Industrial Fire Protection
One Occupational Safety and Health (SH) Elective

Total credits: 12

Concentration in Public Safety Management

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

Total credits: 12

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/Accident Scene Reconstruction

In addition to the above, approved courses from other departments may be taken as electives with the consent of the director of the program.

See the Table of Contents for the certificates in fire science and public safety management.

Forensic Science

Director: Timothy M. Palmbach, Associate Professor of Forensic Science, MS, University of New Haven; JD, University of Connecticut

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 MS degree programs, professional certificates are offered in all the specialties for those who want certification in a second track or who require only the specialized courses.

The criminalistics concentration provides 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 requirement courses and a flexible offering of electives designed to meet individual interests. Degree requirements can be fulfilled in five trimesters. (Note: the Sacramento Campus offers a one-year accelerated program.)

In addition to the graduate forensic science program at the main campus in West Haven, the university offers the master of science in forensic science with a concentration in advanced investigation at its California location in Sacramento. Graduate certificates in advanced investigation and in forensic computer investigation are also available at the California site. 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.

Admission Policy

Because admissions criteria differ, at the time of initial application students must specify which one of the three concentrations they plan to pursue. Students who later decide to change concentration may be required to reapply.

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 coursework includes biochemistry, genetics,molecular biology, statistics, and population genetics or other subjects which provide a foundation knowledge base for forensic DNA analysis. Applications will be strengthened by an overall undergraduate grade 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 will be 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 will be strengthened by natural science coursework and by an overall undergraduate average of at least 3.0 (on a 4.0 scale).

All 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 will be current or former professors and/or employers.

All 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 will be granted for the fall trimester only. The application deadline for the forensic science program will be 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.

MS, Forensic Science

Candidates are required to complete 40 credit hours of graduate work over a period of five trimesters. Transfer of credit from other institutions may be permitted subject to Graduate School policy on transfer credit detailed elsewhere in this catalog. *At the time*

of application to the forensic science program, applicants must specify one of the three areas of concentration.

Thesis

Students may elect to write a thesis in lieu of CJ 686 Forensic Science Research Project I/ CJ 688 Forensic Science Internship I and three credits of elective coursework. Registration for a minimum of six thesis credits (CJ 697, CJ 698) is 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 Graduate School policy on theses as well as all specific departmental requirements.

Required Courses

CJ 614 Survey of Forensic Science
CJ 620 Advanced Criminalistics I
CJ 640 Advanced Criminalistics II
CJ 653 Physical Analysis in Forensic Science
CJ 686 Forensic Science Research Project I
or CJ 688 Forensic Science Internship I

Plus required concentration courses (see below)

Total credits: 40

Elective Courses

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
CJ 645 Drug Chemistry and Identification
CJ 670 Selected Topics
CJ 695 Independent Study
SH 602 Safety Organizations and Administration
SH 615 Toxicology
SH 620 Occupational Safety and Health Law
SH 630 Product Safety and Liability

In addition, other concentration courses (in lists from which one, two, or more must be taken) may 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 Criminalistics

CJ 621 Advanced Criminalistics I Laboratory (1 credit)
CJ 641 Advanced Criminalistics 11 Laboratory (1 credit)
CJ 654 Physical Analysis in Forensic Science Laboratory (1 credit)
CJ 673 Biomedical Methods in Forensic Science
CJ 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
CJ 645 Drug Chemistry and Identification
CJ 660 Forensic Microscopy (4 credits)
CJ 661 Medicolegal Investigation and Identification
CJ 662 Forensic Toxicology (4 credits)
CJ 663 Advanced Forensic Serology I
CJ 664 Advanced Forensic Serology II

Concentration in Advanced Investigation

CJ 616 Advanced Crime Scene Investigation
CJ 632 Advanced Investigation I
CJ 633 Advanced Investigation II
CJ 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

Concentration in Fire Science

CH 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/Accident Scene Reconstruction

See Table of Contents for certificates in forensic science

Industrial Hygiene

Coordinator: Brad T. Garber, Professor of Occupational Safety and Health, PhD, University of California, Berkeley

Industrial hygiene is that aspect of occupational safety and health concerned with preventing illness or disease caused by exposure to hazardous agents in the workplace. Professionals in this field are in demand to lead the effort to meet societal needs for safe and healthful places of employment. The current trend toward increasing concern about workplace environmental issues is one that is likely to continue for the foreseeable future.

Objectives

The MS program is designed to provide a comprehensive education in the technical and managerial aspects of industrial hygiene. Both practicing professionals and those aspiring to enter the field will find their educational needs accommodated. Graduates will be prepared to fill upper-level positions in industry, government, and labor unions.

Admission Requirements

Candidates for admission are required to hold a baccalaureate degree, from an accredited institution, based on a minimum of 120 semester hours or the equivalent. These should include 60 or more, and preferably 68 or more, semester-hour credits in undergraduate or graduate level courses in science, mathematics, engineering, and technology, with at least 15 of those hours at the upper (junior, senior, or graduate) level, and a minimum of 21 semester-hour credits, or the equivalent, in communications, humanities, and social sciences.

MS, Industrial Hygiene

Completion of 48 credit hours of graduate study is required for the master of science in industrial hygiene degree. The transfer of graduate credits from other institutions and/or the waiver of some courses, based on undergraduate study, is permitted subject to the policies detailed in the Graduate Catalog. Flexibility in the choice of electives makes it

possible for students to tailor the program to their individual interests and needs.

Students may elect to write a thesis, in which case they would register for six credits of SH 698/699 Thesis I and II in lieu of the three-credit research project course and one elective.

Required Courses

EN 610 Environmental Health
EN 612 Epidemiology
M 605 Biostatistics
SH 602 Safety Organization and Administration
SH 608 Industrial Hygiene Practices
SH 615 Toxicology
SH 620 Occupational Safety and Health Law
SH 630 Product Safety and Liability
SH 660 Industrial Ventilation
SH 665 Industrial Hygiene Measurements
SH 667 Control of Occupational Health Hazards
SH 690 Research Project I
Electives (four courses)

Total credits: 48

Elective Courses*

CE 605 Solid Waste Management
CE 606 Environmental Law and Legislation
CH 601 Environmental Chemistry
CH 602 Environmental Chemical Analysis
EN 600 Environmental Geoscience
EN 601 Principles of Ecology with Laboratory (4 credits)
EN 606 Environmental Data Analysis
EN 607 Environmental Reports and Impact Assessment
EN 613 Radioactivity and Radiation in the Environment
EN 618 Hazardous Materials Management
FS 625 Chemistry of Fires and Explosions
IE 651/652 Human Engineering I and II
IE 688 Design of Experiments
SH 605 Industrial Safety Engineering
SH 611 OSH Research Methods and Techniques
SH 661 Microcomputers in Occupational Safety and Health
SH 668 Weapons of Mass Destruction I: Chemical and Biological Agents
SH 669 Weapons of Mass Destruction II: Radiological Agents
SH 691 Research Project II
SH 698/699 Thesis I and II

**Other courses may be selected with the approval of the coordinator.*

In addition to the master of science program, an industrial hygiene concentration is available in the MS program in occupational safety and health management, along with graduate certificates in the field.

National Security and Public Safety

Director: Dean Thomas A. Johnson, Professor of Criminal Justice, DCrim, University of California, Berkeley

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 School of Public Safety and Professional Studies and operates at our main campus in West Haven, Connecticut, as well as being hosted by Sandia National Laboratories in Livermore, California and Albuquerque, New Mexico, and at our Crystal City site in Arlington, Virginia. Students applying to the program should therefore designate the campus to which they are applying.

The National Security Program provides students with an understanding of the funda-

mental principles of the legal charter, presidential executive orders, and the framework which guides the operation of national security agencies. Specifically, the role and function of the U.S. agencies comprising the intelligence community will be analyzed, with emphasis on Information Protection and Security. The concentration in Information Protection and Security provides a unique approach to the issues of cyberterrorism and the protection of information management systems within our national security agencies. Research issues in public safety emergency management and homeland security will be emphasized. Finally, corporate security and its new relationship to the role of homeland and national security will comprise a rich element of research inquiry.

MS, National Security and Public Safety

Candidates are required to complete a minimum of 36 credit hours of graduate work, which may include an internship in national security. Transfer credit from other institutions may be permitted subject to Graduate School policy on transfer credit detailed elsewhere in this catalog.

Students in the program are required to complete 15 credit hours of required core courses, 9 credit hours of restricted elective credits from the list below, 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.

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

Plus 21 credits of electives chosen with Dean's approval:

Elective Courses

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 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 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 II
NSP 695 Independent Study

Total Credits: 36

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 will be reviewed. Computer gaming simulations as well as online attack and defense techniques will be presented for student assignments.

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

Plus four of the following:

CJ 625 Information Systems: Threats, Attacks, and Defenses
CJ 626 Firewalls and Secure Enterprise Computing
CJ 627 Internet and Audit Based Computer Forensics
CJ 628 Computer Viruses and Malicious Code
CJ 629 Introduction to Practical Issues in Cryptography
CJ 680 Research Issues in Cyberterrorism

Plus 9 credits of electives chosen with Dean's approval:

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

Occupational Safety and Health Management

Coordinator: Brad T. Garber, Professor of Occupational Safety and Health, PhD, University of California, Berkeley

The MS program is designed to develop the skills required to manage a comprehensive safety and health program. It will accommodate both active practitioners and those who wish to enter this dynamic field. An in-depth education is provided through a program of 27 credit hours of required courses and 21 credit hours of electives. The courses provide training in both technical and management areas.

Specifically, graduates of the program will have received extensive instruction in how to:

- evaluate the quality and effectiveness of existing safety programs
- conduct surveys for health and safety hazards

- institute programs to improve safety and health performance
- establish accident-prevention procedures;
- implement control measures to eliminate or reduce hazards
- recommend methods of compliance with local, state, and federal regulations and with voluntary standards
- manage occupational safety and health programs in industry, government, and labor unions.

Admission Policy

Candidates for admission are required to hold a baccalaureate degree from an accredited institution. Undergraduate courses in general chemistry, general physics, and biology are required. Students who do not meet all requirements will be evaluated on an individual basis.

MS, Occupational Safety and Health Management

Candidates are required to complete 48 credit hours of graduate work. Transfer of credit from other institutions will be permitted subject to Graduate School policy on transfer credit noted elsewhere in this catalog. Consideration for waiver of core courses on the basis of undergraduate studies is at the discretion of the program coordinator.

The student will choose 18 credit hours of electives in consultation with the advisor. In addition, students must take three credit hours of SH 693 Internship, SH 695 Independent Study, or SH 690 Research Project in order to complete the 21-credit elective portion of the program and satisfy the degree/project requirements. Students may elect to write a thesis, in which case they would register for six credits of SH 698/699 in addition to 15 credit hours of other electives.

Students electing to write a thesis must register for thesis credit with the department. The thesis must show the ability to organize material in a clear and original manner and to present well-reasoned conclusions. Thesis preparation and submission must comply with Graduate School policy on theses as well as specific departmental requirements.

Required Courses

MG 637 Management Process
P 619 Organizational Behavior
QA 604 Probability and Statistics
or M 605 Biostatistics
SH 602 Safety Organization and Administration
SH 605 Industrial Safety Engineering
SH 608 Industrial Hygiene Practices
SH 615 Toxicology
SH 620 Occupational Safety and Health Law
SH 630 Product Safety and Liability
Electives (seven courses)

Total credits: 48

Elective Courses*

CE 602 Biological Treatment of Aqueous Wastes
CE 607 Water Pollution Control Processes
CH 601 Environmental Chemistry
EN 602 Environmental Effects of Pollutants
EN 610 Environmental Health
EN 612 Epidemiology
EN 613 Radioactivity and Radiation in the Environment
FS 666 Industrial Fire Protection
IE 651 Human Engineering I
MG 645 Management of Human Resources
MG 664 Organizational Effectiveness
P 640 Industrial Motivation and Morale
SH 611 OSH Research Methods and Techniques
SH 660 Industrial Ventilation
SH 661 Microcomputers in Occupational Safety and Health

SH 665 Industrial Hygiene Measurements
SH 667 Control of Occupational Health Hazards
SH 670 Selected Topics
SH 668 Weapons of Mass Destruction I: Chemical and Biological Agents
SH 669 Weapons of Mass Destruction II: Radiological Agents
SH 690/691 Research Project I and II
SH 693/694 OSH Internship I and II
SH 695/696 Independent Study I and II
SH 698/699 Thesis I and II

**Other courses may be substituted with the consent of the program coordinator.*

Concentration in Industrial Hygiene

Within the master of science program in occupational safety and health management, students may use their electives to fulfill the requirements for a concentration in industrial hygiene. The coursework is designed to meet the needs of both practicing industrial hygienists and those aspiring to enter this profession. Development of skills in the recognition, evaluation, and control of occupational health hazards is the focus of this concentration.

Students pursuing this concentration will take the required core curriculum, the three required credits of internship/research project/independent study or six credits of thesis, and the following electives:

EN 610 Environmental Health
EN 612 Epidemiology
SH 660 Industrial Ventilation
SH 665 Industrial Hygiene Measurements
Electives (two courses)

Total credits: 18

See previous pages for the MS degree program in industrial hygiene.

Graduate Certificates

The School of Public Safety and Professional Studies 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. Persons who may not yet be ready to commit themselves 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.

Fire/Arson Investigation Certificate

Advisor: Robert E. Massicotte, Jr., Assistant Professor of Fire Science, MS, 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, 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

Total credits: 12-13

Fire Science Technology Certificate

Advisor: Robert E. Massicotte, Jr., Assistant Professor of Fire Science, MS, University of New Haven

The 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

Total credits: 12

Forensic Psychology Certificate

Advisor: James J. Cassidy, Associate Professor, Criminal Justice, PhD, Hahnemann University; JD, Villanova University, School of Law

This is a concentrated program of study designed to prepare 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 professionals currently working in law enforcement, courts, corrections, or mental health settings and is also intended to enhance the knowledge base of students in the MS Community Psychology and Criminal Justice programs. 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 and Outcome Evaluation
CJ 648/ P 658 Forensic Treatment Models

Total credits: 12

Forensic Computer Investigation Certificate

Advisor: Dean Thomas A. Johnson, Professor of Criminal Justice, DCrim, University of California, Berkeley

This certificate is designed for those professionals who wish to enhance their knowledge and skills in forensic computer investigation. Courses will be 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 six credits from the following:

CJ 602 Computers, Technology, and National Security Information Management Systems
CJ 603 Internet Vulnerabilities and Criminal Activity
CJ 608 Law and Evidence
CJ 616 Advanced Crime Scene Investigation

CJ 632 Advanced Investigation I
CJ 633 Advanced Investigation II
CJ 651 Criminal Procedure
CJ 670 Selected Topics

Total credits: 12

In addition to the main campus in West Haven, study for the graduate certificate in Forensic Computer Investigation is available at the UNH site in Sacramento, California.

Forensic Science/Advanced Investigation Certificate

Advisor: Timothy M. Palmbach, Associate Professor of Forensic Science, MS, University of New Haven; JD, University of Connecticut

CJ 614 Survey of Forensic Science
CJ 616 Advanced Crime Scene Investigation
CJ 632 Advanced Investigation I
CJ 633 Advanced Investigation II

Plus two of the following:

CJ 608 Law and Evidence
CJ 610 Administration of Justice
CJ 620 Advanced Criminalistics I
CJ 640 Advanced Criminalistics II
CJ 653 Physical Analysis in Forensic Science
CJ 661 Medicolegal Investigation and Identification
CJ 673 Biomedical Methods in Forensic Science
PS 605 Criminal Law

Total credits: 18

Forensic Science/ Criminalistics Certificate

Advisor: Carol Scherczinger, Associate Professor, Forensic Science,BA, Cornell University; PhD, University of Connecticut

Admission to this certificate is limited. Please see advisor early.

CJ 620 Advanced Criminalistics I
CJ 621 Advanced Criminalistics I Laboratory (1 credit)
CJ 640 Advanced Criminalistics II
CJ 641 Advanced Criminalistics II Laboratory (1 credit)
CJ 653 Physical Analysis in Forensic Science
CJ 654 Physical Analysis in Forensic Science Laboratory (1 credit)
CJ 673 Biomedical Methods in Forensic Science
CJ 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
CJ 614 Survey of Forensic Science
CJ 645 Drug Chemistry and Identification

Total credits: 19-20

Forensic Science/ Fire Science Certificate

Advisor: Carol Scherczinger, Associate Professor, Forensic Science,BA, Cornell University; PhD, University of Connecticut

CJ 640 Advanced Criminalistics II
CJ 649 Fire Science Investigation and Arson Analysis (4 credits)
CJ 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
CJ 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/Accident Scene Reconstruction
CJ 693 Criminal Justice Internship I

Total credits: 19

Industrial Hygiene Certificate

Advisor: Brad T. Garber, Professor of Occupational Safety and Health, PhD, University of California, Berkeley

This certificate is designed for practicing professionals who wish to increase their knowledge and skills in industrial hygiene as well as for those who wish to enter this field. Courses of study are individually tailored to the specific occupational needs of each applicant.

A total of 15 credits in industrial hygiene, toxicology, and related fields must be completed. Students, in consultation with the advisor, will design a course of study consisting of the following offerings or approved substitutes.

Any five of the following:

SH 602 Safety Organization and Administration
SH 608 Industrial Hygiene Practices
SH 611 OSH Research Methods and Techniques
SH 615 Toxicology
SH 660 Industrial Ventilation
SH 661 Microcomputers in Occupational Safety and Health
SH 665 Industrial Hygiene Measurements
SH 667 Control of Occupational Health Hazards

Total credits: 15

Information Protection and Security Certificate

Advisor: Dean Thomas A. Johnson, Professor of Criminal Justice, DCrim, University of California, Berkeley

This certificate is designed to prepare individuals for the responsibilities of protecting their agency or corporate information systems. The basics of information systems security as well as the legal issues and cyber-response strategies will be reviewed. Computer gaming simulations as well as online attack and defense techniques will be presented for student assignments. A selection of these certificate courses is offered online, with instruction delivered over the Internet. Appropriate computer competency is assumed as 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

Total credits: 12

National Security Certificate

Advisor: Dean Thomas A. Johnson, Professor of Criminal Justice, DCrim, University of California, Berkeley

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, the graduate certificate provides an alternative. Application for the graduate certificate requires the Dean's approval.

Required Courses

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

Total credits: 12

Occupational Safety Certificate

Advisor: Brad T. Garber, Professor of Occupational Safety and Health, PhD, University of California, Berkeley

This certificate is designed to fit the needs of professionals with or without an advanced degree who wish to increase their knowledge and skills in the dynamic field of occupational safety. It is also designed to offer training to persons who wish to enter the field. The wide variety of courses allows students to tailor their study to meet individual needs.

Students will select 15 credits in the safety and health field in consultation with the advisor, designing a course of study consisting of the following offerings or approved substitutes.

Any five of the following:

SH 602 Safety Organization and Administration
SH 605 Industrial Safety Engineering
SH 608 Industrial Hygiene Practices
SH 611 OSH Research Methods and Techniques
SH 615 Toxicology
SH 620 Occupational Safety and Health Law
SH 630 Product Safety and Liability
SH 660 Industrial Ventilation
SH 661 Microcomputers in Occupational Safety and Health
SH 665 Industrial Hygiene Measurements

Total credits: 15

Public Safety Management Certificate

Advisor: Robert E. Massicotte, Jr., Assistant Professor of Fire Science, MS, University of New Haven

This 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

Total credits: 12

One of the following electives may be substituted for one of the above required courses, 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 Services Management Certificate

Advisor: Mario T. Gaboury, Associate Professor of Criminal Justice, PhD, Pennsylvania State University, JD, Georgetown University Law Center

This certificate is designed for professionals who work with crime victims. Students will 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

Total credits: 12

COURSE DESCRIPTIONS

Course descriptions are arranged alphabetically by the course prefix code letters, as listed below. For the purpose of brevity, course descriptions may consist of sentence fragments. Unless otherwise specified, all graduate courses carry three credit hours.

A

A Accounting and Taxation

B

BI Biology

C

CE Civil and Environmental Engineering
CH Chemistry
CJ Criminal Justice
CM Chemical Engineering
CO Communication
CS Computer Science

E

E English
EC Economics
ED Education
EE Electrical and Computer Engineering
EN Environmental Science
ES Engineering Science
EXID Executive M.B.A.
EXIE Executive Engineering Management

F

FI Finance
FS Fire Science

H

HS History
HU Humanities

I

IB International Business
IE Industrial Engineering

L

LA Law
LG Logistics

M

M Mathematics
MB Molecular Biology
ME Mechanical Engineering
MG Management
MK Marketing

N

NSP National Security & Public Safety
NU Nutrition

P

P Psychology
PA Public Administration/ Health Care
PH Physics
PL Philosophy
PS Political Science

Q

QA Quantitative Analysis

S

SH Occupational Safety and Health
SO Sociology

T

THM Tourism and Hospitality

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 regular 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 will focus 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 will also be 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 will 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 and 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; effect of tax treaties.

A 611 State and Local Taxation

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 hours 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, published articles. Research projects will be assigned for written submission. 1 credit

A 616 Taxation for Management
Introduction to federal taxation and its impact on business decision making. Overview of the basics of federal taxation, its traps, and tax planning opportunities. Complete overview of all areas of federal taxation to understand 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, partnerships, income taxation of estates and trusts, estate and gift taxes. *Not open to MS in Taxation program 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 selective 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. Will impart a working knowledge of techniques used in business audits.

A 650 Advanced Accounting Theory
Prerequisite: A 630 or six hours 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 the 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 hours 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.

Biology

BI 605 Biostatistics
A non-calculus-based course which 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, 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; 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, 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, 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, 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, biochemical reactions. Quantitative relationships for predictive framework. Applications include site characterization, remediation, wellhead protection, flow and transport modeling, 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, condi-

tioning, 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 will be investigated, as well as problems in urban hydrology.

CE 623 Open Channel Hydraulics

Prerequisite: undergraduate course in hydraulics. Basic theories of open channel flow will be presented and corresponding equations developed. Methods of calculating uniform/steady flow; gradually varied flow; and rapid, spatially varied, unsteady flow will be 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 will be 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 including 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 pretensioned and post-tensioned concrete structures. Beams, columns, connections, partial prestressing, deflections, 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 will be 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 will also be 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, evaluation of hardware and software.

CE 690 Research Project
Prerequisites: 18 graduate hours 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 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
A continuation of Independent Study I.

CE 698 Thesis I
Prerequisites: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

CE 699 Thesis II
A 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 discussion of pollutants, toxicology, and some 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. Some of the topics covered are synthetic strategies, including 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 CH202 Organic Chemistry and CH221 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 will include ^{1}H mapping, COSY, NOE, ^{13}C DEPT series, and other modern experiments. Utilization of low- and high-resolution mass spectral data will 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 the recent advances made in instrumentation and current analytic techniques.

CH 640 Chemical Separations

Prerequisites: Evidence of mastery of the concepts of chemistry as demonstrated with a BS degree in chemistry or biology. Students should have courses equivalent to UNH courses CH202 Organic Chemistry and CH221 Instrumemental Methods of Analysis. Biological systems contain many thousands of different 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 I

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 (MB601-MB603), and a graduate course in cell biology (MB607). Pharmacology is the study of therapeu-

tics, agents administered to achieve a beneficial therapeutic effect on some disease process. This survey course will cover a general overview of pharmacology including principles of pharmacodynamics (mechanism of action of drugs) and pharmacokinetics (the role of drug absorption, distribution, metabolism, and excretion in drug action). The general concepts will be 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 will cover the fundamental techniques and ideas for generating diverse libraries of compounds. Students will learn and utilize several computer packages to design, analyze, and evaluate combinatorial libraries. Examples will be 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, E659 Writing and Speaking for Professionals, and permission of the instructor. Weekly discussions and seminars on current topics in medicinal chemistry will be presented by students and faculty. Students will 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
A 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
A continuation of Thesis I.

Criminal Justice

CJ 600 Computer Crime: Legal Issues and Investigation Procedures
An overview of computer crime and the procedures forensic computing specialists, law enforcement investigators, and prosecutors must invoke to prosecute computer criminals successfully.

CJ 601 Mental Health, Law, and Criminal Justice
Basic psychological theory and specific applications in the criminal justice system will be 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 will also be 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 which 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

the various 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. A review of treatment practices in these areas will be provided.

CJ 607 Psychological Applications in Criminal Justice

Prerequisite: CJ 601 or permission of instructor. This course will explore 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 will be examined. Students will be 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 PhD in Criminal Justice.

CJ 610 Administration of Justice

A study of all 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 all the problems which arise during this process and to consider some possible solutions which 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 will become familiar with basic types of research designs, survey research methods, evaluation methods.

CJ 612 Criminal Justice Management

The development of the theory and practice of criminal justice management in the United States. 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 of Criminal Justice. 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 will also be introduced to the use of SPSS for data analysis.

CJ 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.

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 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.

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, biosocial theories, developmental theories of crime, and economic

and social psychological theories of criminal behavior.

CJ 620 Advanced Criminalistics I
Corequisite: CJ 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.

CJ 621 Advanced Criminalistics I Laboratory
Concurrent registration in CJ 620 Advanced Criminalistics I is required. Laboratory fee required. 1 credit

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 will be covered. Legal case method pedagogy will be utilized.

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.

CJ 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 will construct, deploy, and test a real firewall against common Internet attacks.

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.

CJ 628 Computer Viruses and Malicious Code
This course addresses theoretical and practical issues surrounding computer viruses.

CJ 629 Practical Issues in Cryptography
Examples of current historical cryptography and stegonagraphic systems; major types of cryptosystems and cryptanalytic techniques, and how they operate; hands-on experience with current cryptographic technology.

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 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.

CJ 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.

CJ 635 Comparative Criminal Justice
Affords students the opportunity to explore a number of foreign systems with emphasis on policing. Different perspectives on crime problems will be seen through the prism of foreign culture.

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 will be given to issues of decision-making and its tools.

CJ 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 will be discussed.

CJ 641 Advanced Criminalistics II Laboratory

Laboratory fee required. 1 credit

CJ 642 Computer Forensics: Core Knowledge and Design of Computer Forensic Lab

This course will provide a thorough understanding of operations and functions of a computer forensic laboratory. The recovery of digital evidence and certification skills of forensic computer experts will be discussed.

CJ 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.

CJ 646 Abnormal Psychology in Forensic Populations

Prerequisites: Undergraduate or graduate course in Abnormal Psychology, CJ 601, CJ 605. 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,psychoses, pedophilia, and other sexual paraphilias. Special emphasis on psychopathy, psychopathology, criminal behavior, and Hans Toch's work on psychopathology created in prison settings. Well-known forensic cases will be examined. This course is a prerequisite for all other courses in the Forensic Psychology sequence. (See also P 656.)

CJ 647 Forensic Assessment & Outcome Evaluation

Prerequisites: CJ 601, CJ 605, and CJ 646. This course will review the spectrum of assessment instruments used in evaluation and treatment in inmate and patient settings. Pros and cons of forensic interviewing will be examined. Emphasis on ability to assess violence and risk will be included. Students will come to understand the strengths and limitations of a wide variety of clinical assessment tools. Special concentration on techniques to assess malingering. (See also P 657.)

CJ 648 Forensic Treatment Models

Prerequisites: CJ 601, CJ 605, CJ 646, and CJ 647. This course will examine 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 will be covered. Treatment of insanity acquittees, incompetent-to-stand-trial patients, inmates, juvenile offenders, psychopaths, and sex offenders will be examined. Management of high-risk forensic populations will be covered. Particular emphasis will be 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

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 will take students from the scene to the court, criminal or civil. *Enrollment restricted to fully matriculated graduate students in criminal justice and forensic science only.*

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 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.

CJ 654 Physical Analysis in Forensic Science Laboratory
Laboratory fee required. 1 credit

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 will be included.

CJ 659 Futures Research: Long-Range Planning & 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 will be discussed. A multidisciplinary approach will be utilized. The student will learn to make use of several selective forecasting methodologies. The focus will be on the implementation of empirically derived strategies. The context will be justice system organizations. The purpose is to learn to effect meaningful social change.

CJ 660 Forensic Microscopy
The theory and techniques of optical microscopy required to use the microscope for evidence detection, analysis, and evaluation. Microscopical methods of analysis and polarized light microscopy will be covered in lecture and laboratory. Laboratory fee required. 4 credits.

CJ 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.

CJ 662 Forensic Toxicology
An in-depth analysis of forensic toxicological procedures and methods; determinations of metallic, volatile, and soluble poisons; analysis for narcotic drugs and other drugs of abuse and dosage form drugs that are commonly abused or found contributing to cause of death. Laboratory fee required. 4 credits.

CJ 663 Advanced Forensic Serology I
A comprehensive study of the theory and practice of isoenzyme, serum protein, and immunoglobulin genetic markers in human blood and body fluids. Electrophoretic and isoelectric focusing techniques. Interpretation of genetic marker results in blood individualization. Laboratory fee required. 4 credits.

CJ 664 Advanced Forensic Serology II
A comprehensive study of the theory and practice of biochemical and immunologic procedures for blood and body fluid identification; typing of Rh, MNSs, and other red cell antigens in blood and blood stains; antiserum selection and evaluation; ELISA techniques; DNA polymorphism analysis. Laboratory fee required. 4 credits.

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 673 Biomedical Methods in Forensic Science
Prerequisite: CJ 620. Corequisite: CJ 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 used today in forensic biology.

CJ 674 Biomedical Methods in Forensic Science Laboratory
Concurrent registration in CJ 673 Biomedical Methods in Forensic Science is required. Laboratory fee required. 1 credit

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 will include 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 will examine such issues as historical growth, role, mission, and future of the industry. Other topics will include professionalization and ethics in the field.

CJ 680 Research Issues in Cyberterrorism
This course will consist of lectures, discussions, and empirical research into issues in cyberterrorism, its causes, its limitations, and its implications. It will focus 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 which use the information arena as their primary terrorism mechanism.

CJ 684 Fire/Accident Scene Reconstruction
Application of principles of reconstruction of the scene of a fire or accident, including proper procedure for examining physical evidence to determine cause. Emphasis on preparation of reports, testimony for hearings and trials, rendering of advisory opinions to assist in resolution of disputes affecting life and property. (See also FS 684.)

CJ 686 Forensic Science Research Project I
Individual guidance on a research endeavor. 1-3 credits.

CJ 687 Forensic Science Research Project II
Prerequisite: CJ 686. 1-3 credits.

CJ 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.

CJ 689 Forensic Science Internship II
Prerequisite: CJ 688.

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 will be supervised by designated agency and department personnel.

CJ 694 Criminal Justice Internship II
Prerequisite: CJ 693.

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 hours. Periodic meetings and discussions of the individual student's progress toward the completion of the thesis.

CJ 698 Thesis II
A continuation of Thesis I.

CJ 699 Thesis III
A continuation of Thesis II.

CJ 801A-I Criminal Justice Dissertation
Prerequisite: Successful completion of the doctoral qualifying exams. Periodic meetings and discussions of the individual student's progress in the preparation of the doctoral dissertation. This course may be taken more than once; each registration is for variable credit, from 1-9 hours. Each doctoral student will be required to complete a minimum of 18 trimester credit hours of dissertation credit prior to earning the PhD degree.

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 will also be 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 will vary with new developments. Legislative mandates related to control technologies and emission limits will be 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 hours 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 which 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

A 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

A 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 will be directed toward management communication styles, conflict, disagreement, change in organizations, formal v. 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 publics.

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. Training techniques for the public relations person who will work with executives giving corporate messages internally and press statements externally.

CO 632 Contemporary Public Relations Issues
Using the 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 non-technical 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 will include 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 will 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 which 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
A continuation of Independent Study I.

CO 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings with the advisor for discussion of the individual student's progress in the preparation of a thesis.

CO 699 Thesis II
A continuation of Thesis I.

Computer Science

CS 601 Technology in the Workplace
Prerequisite: Graduate standing. Comprehensive coverage of the knowledge and skills needed by a manager to make effective IT decisions and manage state-of-the-art systems. Topics include: productivity software, networks, malware, digital rights, software engineering standards, outsourcing, and applied cryptography.

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 in programming. Problem solving methods, program planning, development, and testing. Sound programming practices and good style. Simple preprocessor usage, objects, expressions, functions, libraries, basic types, arrays, and pointers. Extensive programming will be 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 preprocessor, 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 616 Assembly Language
Prerequisites: CS 610, CS 640. Introduction to assembly language programming, including study of

instruction types and operation, assembly language syntax and features, explicit use of memory, macros, subprograms, interrupts, I/O conversions, linking with higher-level programs.

CS 617 Java Programming

Prerequisite: CS 620. Object-oriented programming, graphic interfaces, and event handling in Java, using the Abstract Windows Toolkit. Also covers files, exceptions, concurrency and synchronization with threads.

CS 620 Data Structures

Prerequisite: CS 610. An examination of data structures, their function and uses. Topics include basic data representations, arrays, linked structures, stacks, queues, trees, graphs, hashing. Study of relation between data structures and algorithms, with sorting and searching, elements of complexity analysis. Recursion and other solution techniques. Students will develop and run several programs in a high-level language.

CS 622 Database Systems

Prerequisite: CS 604 or knowledge of a programming language. A survey of database systems, their purpose, structure, function, and use. Topics include an overview of DB systems, major DB models, design and implementation methods in DB models, introduction to typical DB systems, and internal operation of DB systems.

CS 622B Advanced Database Systems

Prerequisites: CS 610, CS 622. A second course in database systems, covering advanced topics and new developments in the database field. Topics from: 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/Visual Basic

Prerequisites: CS 620, CS 622. A course for experienced programming students in rapid software development within the environment of Visual Basic. 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 as the final product of this course.

CS 625 Software Project Management

Prerequisite: CS 628. A course for software professionals who are interested in expanding their knowledge of software project management. Topics include project management and roles, project 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, 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 distributed database architectures, distributed database 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, parallel database systems.

CS 628 Object-Oriented Analysis and Design

Prerequisite: CS 617 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.

CS 630 Introduction to Computing Theory

Introduction to the theory of computers and computation including 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, NP-Completeness.

CS 633 Topics in Algorithms

Prerequisite: CS 632. Important algorithms usually omitted in ear-

lier courses. Topics to be selected at the instructor's discretion from, but not limited to, measuring performance of algorithms, graph algorithms, string searching, range searching, red-black trees, B-trees, splay trees, random number generators, computational geometry, the fast Fourier transform, number theoretic algorithms, parallel algorithms, randomized algorithms.

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 will also be studied, including DES, 3DES, IDEA, RSA, Diffie-Hellman, MD5, SHA, and DSS. Other algorithms examined will be 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

Prerequisites: CS 620, CS 630, and knowledge of at least two high-level computer languages. The structure, syntax, and semantic aspects of computer languages will be studied. Programs will be written in the FORTH language.

CS 640 Computer Organization

The structure and the function of computers. The nature and the 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 multiprocessor systems. Topics include the memory, the 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

Prerequisites: CS 610, CS 644. The ISO 7-level model, network topology, communications theory, protocols, virtual circuits and packet switching, local networks (CSMA/CD, token ring), error detection and correction. Additional topics may include security (Data Encryption Standard, public-key cryptosystems), TCP/IP, sockets.

CS 644 Operating Systems

Prerequisites: CS 610, 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, interprocess 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 644. 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 will use both Unix and Windows systems.

CS 646 Introduction to Computer Security

Prerequisite: CS 644. 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. Such services may

include, but are not limited to, the following: email, web sites, 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 644. 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 operations and process control, interprocess communication, client-server routines.

CS 649 Network Analysis

Prerequisite: EE 610 or CS 642. Building on a foundation 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 an individual and a major group project. 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 packet examination.

CS 650 Computer Graphics

Prerequisites: CS 620, M 610 or equivalent. The mathematical foundations for computer graphics and introduction to the current state of the art of graphics programming. Includes 2-D and 3-D viewing, geometric transformations, clipping, segmentation, user interaction, curves, surfaces, color, modeling, and object hierarchy.

CS 655 Internet Applications with Java

Prerequisite: CS 617 or permission of the instructor. A second course in Java surveying many techniques for communicating information over the Internet. Topics include establishing network connections, remote method invocation, database connectivity, servlets, JavaServer Pages, JavaBeans, XML, and internationalization.

CS 657 Programming Window Systems

Prerequisite: CS 626. A survey of facilities found in all window operating systems including the window manager, the event queue, icons, and fonts. Other topics include bitmap display, use of resources in a dialog editor, preserving state information in a registry, and providing context-sensitive help. Programming assignments will use a package such as Microsoft Foundation Classes.

CS 660 Artificial Intelligence

Prerequisite: CS 620. Principal techniques of a functional programming language and the fundamental goals and methods of artificial intelligence (AI), a field which attempts to simulate intelligent behavior by computer. Includes the design and implementation of AI programs.

CS 663 Mobile Robotics

Prerequisites: CS 620, CS 644. 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 will work both individually and in groups to construct and program small mobile robots using Lego Mindstorms 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

Prerequisite: The nature of any prerequisites will depend on the topic. An examination of new developments or current practices in computer science. Topics will vary from trimester to trimester.

CS 690 Master's Project

Prerequisites: 15 credit hours, a quality point ratio (QPR) of at least 3.3, and completion of all core courses. Petition to register must be approved by a supervising faculty member, the program coordinator, and the department chair. Completion of a significant project 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 692 Internship I

Prerequisites: CS 620, 18 graduate credit hours, 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. This is a Free Elective

course only and may not be counted as a Restricted Elective. 1 credit

CS 693 Internship II
A continuation of Internship I. 1 credit

CS 694 Internship III
A continuation of Internship II. 1 credit

CS 695 Independent Study I
Prerequisite: 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
A continuation of Independent Study I.

CS 698 Thesis I
Prerequisites: 15 credit hours 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
A 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, will be beneficial for transmitting systematic editing techniques at various school levels. The course will focus on sentence structure and touch upon 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, will be 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, as well as 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 the multinational's operations and the many adaptations management must undertake to interact successfully with the various global business environments. Topics will be examined from both domestic and international perspectives and will 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's rights, equal opportunity, and grievance procedures. Additional time devoted to third-party settlements—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 hours and permission of program coordinator. A supervised work experience in a selected organization, arranged for course 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
A continuation of Independent Study I.

EC 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

EC 699 Thesis II
A 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 practicum satisfies the requirement of the State of Connecticut for teacher candidates to demonstrate attainment of the appropriate CT 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 will learn about the CT Teaching Competencies and classroom management techniques and will be given a broad overview of school-related issues. 1 credit, to be taken in advance of first trimester of study.

ED 603E/M/S 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. 2 credits

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 classrooms. Describes the developmental and learning characteristics of exceptional students, reviews educational and supportive services, and examines laws impacting on 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 moods 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 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
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. 1-3 credits

ED 621E Teaching Strategies in Mathematics
Introduction to current concepts and trends in the field of mathematics instruction with particular focus on new materials, methods, and teaching strategies that will assist prospective teachers as they plan, present, and evaluate mathematics education. 2 credits

ED 621M/S Teaching Strategies in Mathematics
Introduction to current concepts and trends in the field of mathematics instruction with particular focus on new materials, methods, and teaching strategies that will assist prospective 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. 2 credits

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 with particular focus on new materials, methods, and teaching strategies that will assist prospective 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 with particular focus on new materials, methods, and teaching strategies that will assist prospective 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 pre-university 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 authentic 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 will be studied.

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 will be studied. 2 credits

ED 627 Writing in the Content Areas
Designed for teachers in the middle school and high school content areas. Focuses on training teachers to implement a variety of instructional methods related to developing writing skills across disciplines. 2 credits

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 all reading students, whether in regular classrooms, special education settings, remedial reading classes, or reading clinics.

ED 630E Children's Literature
Provides knowledge of children's and young adults' 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 630M/S Literature for Elementary/Middle/ Secondary School
Provides knowledge of children's and young adults' 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 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 six 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 will be 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, will be beneficial for transmitting systematic editing techniques at various school levels. The course will focus on sentence structure and touch upon 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 will deal 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 642E/M/S Current Instructional Trends
Course designed to update classroom teachers' knowledge of instructional methodologies in particular content areas. Topics vary depending on the content area and major disciplines. 2 credits; may be taken more than once; limited to six credits in any one content area.

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 661 Principles of Cooperative Work Education
This course introduces educators to the theories and principles of cooperative work education. It will discuss 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 course on current issues related to American education and the differing viewpoints expressed. While the exact content is expected to vary from year to year, in accordance with the varied interests of educators and the general public, the basic theme is the exposition of the fundamental and present concerns in education.

ED 681 Principles of Classroom Management
No prerequisite course is required. This course introduces students to the basic principles of effective classroom and behavior management. The course will examine 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 will also be examined.

ED 682 Measurement, Assessment, and Evaluation
Trains teachers and other 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.

ED 683 Computer Applications for Teachers
Provides or enhances a working knowledge of educational computing in order to evaluate educational software and create new instructional materials for the classroom. Relates students' knowledge of pedagogy and curriculum to the creative use of instructional technology. 1-3 credits

ED 685 Research in the Schools
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 significant school-based project designed in ED 689 which 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 692 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 will register for ED 692 I and Capstone students (non-interns) will register for ED 692C. 1 credit

ED 693 Field Experience II
Continuation of ED 692.All students are expected to attend seminars. Interns will register for ED 693 I, and Capstone students (non-interns) will register for ED 693C. 1 credit

ED 694 Field Experience III
Continuation of ED 693. All students are expected to attend seminars and to complete a teaching portfolio. Interns will register for ED 694 I, and Capstone students (non-interns) will register for ED 694 C. 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
A continuation of Independent Study I. 1-3 credits

ED 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

ED 699 Thesis II
A continuation of Thesis I.

Electrical and Computer Engineering

EE 603 Discrete and Continuous Systems I
Prerequisite: computer programming competence. Continuous and discrete linear systems, system function. Z transforms, Fourier transforms, periodic functions, discrete Fourier series, fast Fourier transforms, Hilbert transforms. Digital processing of analog signals, sampling theorems.

EE 604 Discrete and Continuous Systems II
Prerequisites: EE 603 and M 611 or consent of instructor. Review of linear vector spaces, bases, Hilbert spaces. Introduction to the similarity transformation, diagonalization of the A matrix, properties of similarity transformations, Jordan forms, quadratic forms, matrix norms, functions of A matrix, Caley-Hamilton theorem, pseudoinverse. Mathematical modeling of physical systems, state space representation of dynamical systems, computer-oriented mathematical models. State space and linear systems, meaning of state, methods of obtaining state equations. Stability of physical systems and linear systems, linearization and stability in the small, equivalent linearization and the describing function, stability in the large and the second method of Liapunov, exact frequency domain stability criteria — Popov's method and its extension.

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, 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, 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
Reference models TCP/IP and OSI, transmission media, Data Link Layer issues, the Medium Access Control Sublayer, Networking devices and topologies, LANS, WANS, 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, 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, systems theory. Introduction to fuzzy logic and fuzzy control systems. Basic fuzzy logic concepts will be 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, fuzzy pattern recognition. Homework will consist of computer exercises and simulations; a final project is required.

EE 630 Electronic Instrumentation I
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 631 Electronic Instrumentation II
Prerequisite: EE 630.

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 I
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 638 Power Systems Engineering II
Prerequisite: EE 637.

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, signal representation. Analog and digital modulation, pulse code modulation, delta modulation, time and frequency multiplexing. Noise in communication systems.

EE 646 Digital Communications I
Prerequisite: EE 645. Formatting and baseband transmission, bandpass modulation and demodulation, communication link analysis, channel coding synchronization.

EE 647 Digital Communications II
Prerequisite: EE 646. Multiplexing and multiple access, spread spectrum techniques, source coding and encoding, encryption and decryption.

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 lowpass, highpass, bandpass, and bandstop filters. The DFT and IDFT; FFT algorithms.

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, clocked CMOS logic, Dominio logic, SRAM and DRAM, VCO, Voltage generator, lab activities.

EE 658 Embedded Applications
Design of advanced embedded microcontroller applications. Interface and control of several devices and buses. Classwork will focus 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 lightwave technology, optical fibers, LEDs and lasers, signal degradation in optical fibers, photodetectors, power launching and coupling, connectors and splicing techniques, transmission link analysis. Includes selected laboratory experiments.

EE 681 Lightwave Technology
Prerequisite: EE 680. Advanced topics in lightwave technology. Optical fiber waveguides, transmission characteristics of optical fibers, ray theory, and electromagnetic mode theories are considered. Forms of communication systems and distribution networks. Optical sources, detectors, and receivers are discussed in conjunction with modulation formats and system design.

EE 682 Computer Architecture
Review of design of large systems, arithmetic and logical operations, design of ALU, design of control unit, microprogramming, RISC architecture, memory organization, design of cache memory, system organization, design of a processor 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, 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, 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, Pontryagin's minimal principle.

EE 690 Research Project
Prerequisites: 15 graduate hours 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 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
A 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
A continuation of Thesis I.

EE 699 Thesis III
A continuation of Thesis II.

Environmental Science

EN 600 Environmental Geoscience

Study of the systems of hydrosphere and lithosphere important in the understanding of the causes of and solutions to environmental problems, including natural hazards as well as energy, mineral, and water resources. Course covers material from geology and engineering geology, geophysics, geomorphology, and hydrology.

EN 601 Principles of Ecology with Laboratory

Presentation of current topics in the 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 will focus on a quantitative evaluation of various 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 will be emphasized. Wetland delineation, functional assessment of wetlands, and wetland creation and restoration will be among the topics discussed. Field trips and laboratory sessions will 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 alternative, required.

EN 606 Environmental Data Analysis

Prerequisites: 15 graduate hours and a previous 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 hours 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 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. 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 will focus 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 mode 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. (See also SH 615.)

EN 616 Human Health and Environmental Risk Assessment

Prerequisites: EN 601, CE 606, and EN 615. Introduction to 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 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, 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 will 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 previous college-level course in physical geology or geography or permission of instructor. Study of landforms and the processes that produce them including 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; required 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 previous 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 previous 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 will be related to their role in environmental problem solving and decision making.

EN 632 Field Geology of the Northeast
Prerequisite: EN 600 or a previous 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) will focus on site geology, geomorphology, and environmental problems as well as field observation and interpretation. Transportation and costs will be shared. 4 credits

EN 633 Selected Topics in Field Geology
Prerequisite(s): 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 640 Introduction to Geographical Information Systems
Survey of GIS technology, research, and applications in natural resource management, environmental assessment, urban planning, business, marketing and 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, business, planning), development of GIS systems.

EN 643 Application of GIS in Environmental Science
Prerequisite: EN 642 or consent of instructor. Application of advanced GIS techniques to environmental assessment and management constructed around a real-world project from a government agency or nonprofit organization. Students will collaborate to design and implement the complete GIS application. Definition of project goals, special project needs, and steps necessary for successful completion.

EN 650 Environmental Microbiology
Prerequisites: undergraduate biology major, or a course in biology and a course in organic chemistry. Interaction of microorganisms (principally bacteria and fungi) and their environments, stressing transformations they may accomplish depending on physical and chemical circumstances. Practical application of microbes in sewage and other soil/wastewater cleanup, 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 site(s) 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
A continuation of Independent Study I.

EN 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

EN 699 Thesis II
A 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 "Project Lead the Way" curriculum. Both theoretical and practical skills in the pedagogical and content domains needed to teach classes in this field are addressed. Laboratory assignments will include computer simulation of circuits and the wiring of prototype circuits. The lectures will touch on printed circuit board design and implementation of digital circuits. Development of attitudes, procedures, and skills related to safety will be 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
Prerequisites: 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. Both theoretical and practical skills in the pedagogical and content domains needed to teach classes in this field are addressed. Emphasis is on advanced 2-D construction, 3-D solid modeling, and design drawing generation. A PC-based CAD package is used for all coursework. Development of attitudes, procedures, and skills related to safety is 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 will be 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 the 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 it relates to major federal statutes commonly invoked in corporate prosecutions. Major emphasis will be 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 which 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 is drawn from government, business, the press, and academia. It includes 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 changes, 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 will 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 which culminates in student research being presented and critiqued, and in which state-of-the-art topics may be examined by nonfaculty guest lecturers.

Executive 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 timely fashion within demanding customer-supplier relationships.

EXIE 902 Managing Uncertainty

Probability models, stochastic processes, and descriptive statistic approaches applicable to managing engineering and technology projects. Topics include random variables, probability 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 will be 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, off-shore 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 Queueing Theory and Applications

Survey of queueing problems met in both manufacturing and service organizations, and a description of queueing theory applicable to such problems. Roles of analysis and simulation are discussed in the context of managing queues and solving queueing 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 will also include basics of the Internet and multimedia technologies, prod-

ucts 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 the 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 its implications on investment strategy; the cost of capital and capital structure and its implications for financing strategy; leasing; dividend policy; fundamental risk management concepts and implications; and (if time is available) mergers, acquisitions, divestiture, the market for corporate control and the hedging of corporate risk exposure.

FI 602 Finance Strategy and Valuation

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; 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 the capital markets. Various topics will be selected that highlight recent developments. The primary areas of selection will be financial and capital market innovations, monetary policy, domes-

tic and international money markets, and techniques for analyzing financial markets. Students will be 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 selection will be value creation, human capital, globalization, risk management, and strategic management. Students will be 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 hours or permission of the instructor. Independent study under the supervision of an advisor.

FI 693 Internship
Prerequisites: six credits of advanced finance coursework 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
A continuation of Independent Study I.

FI 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

FI 699 Thesis II
A continuation of Thesis I.

Fire Science

FS 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.)

FS 631 Organization and Management of Public Fire Protection
A presentation of modern management principles and techniques to 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 the fire service in 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 will consider 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 analy-

sis 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 predetermined 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 will be included. Use of codes and standards to determine specific protection requirements will be emphasized.

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 the current and future 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 hours in a public safety discipline or permission of the program coordinator. Problems in public safety management and current techniques being used 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
A second course in the field of public safety management. See FS 681 for course description.

FS 683 Seminar/Research Project on Comparative Public Safety Systems
Prerequisite: 18 undergraduate/graduate hours in a public safety discipline or permission of the program coordinator. Examination, assessment, and comparison of various approaches used in protecting the public's 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 for course may vary; a three-day specially scheduled seminar may be included.

FS 684 Fire/Accident Scene Reconstruction
Application of the principles of reconstruction of the scene of a fire or accident, including proper procedure for examining physical evidence to determine the cause.

Emphasis on preparation of reports, testimony for hearings and trials, rendering of advisory opinions to assist in resolution of disputes affecting life and property. (See also CJ 684.)

FS 690 Research Project
Prerequisite: 30 graduate credit hours. 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 complemented 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, 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 hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

FS 699 Thesis II
A 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 coverage of 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 colonialism 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 through 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 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 the multinational's operations and the many adaptations management must undertake to interact successfully with the various global business environments. Topics will be examined from both domestic and international perspectives and will 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 651 International Marketing
Prerequisites: IB 643, MK 609. The application of marketing principles and techniques in a global environment.A managerial approch 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.

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 and 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 hours and permission of the instructor. Independent study under the supervision of an advisor.

IB 693 Internship
Prerequisites: six 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
A continuation of Independent Study I.

IB 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

IB 699 Thesis II
A 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, queueing 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: M 610 or equivalent. Probability of events. Random variables and expectations; discrete and continuous distributions; important standard distributions and applications; moment generating functions; central limit theorem.

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 covariance.

IE 611 Decisions in Operations Management
Prerequisites: MG 637 and 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 one of CS 604 through CS 610 or equivalent, 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, 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 are covered. Applications to network flow problems.

IE 622 Queueing Theory
Prerequisite: IE 601 or equivalent. Elements of queueing 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
Prerequisites: CS 606 or equivalent, IE 621. Advanced mathematical programming techniques. Integer programming, goal programming, and multiple objective linear programming techniques will be covered. Computer applications will be 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 principles of 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 nonmanufacturing facilities. Coverage 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, 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, specialized applications. Content may vary from trimester to trimester.

IE 681 System Simulation
Prerequisites: IE 601, CS 606 or equivalent, or permission of the instructor. Methods of modeling and simulating man-machine systems. Thorough coverage of

discrete event simulation. Random number generators and variate generations discussed. Use of a simulation package and several projects will be required.

IE 682 Advanced System Simulation
Prerequisite: IE 681 or equivalent. Emphasis will be 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 presented in detail, illustrated with large-scale case studies. Diverse systems are analyzed covering the social, urban, industrial, and military spheres. Techniques include utility theory, decision analysis, and technological forecasting.

IE 685 Theory of Optimization
Prerequisites: IE 601; CS 606 or equivalent. 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 relations 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 queueing, 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 hours 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 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
A continuation of Independent Study I.

IE 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

IE 699 Thesis II
A continuation of Thesis I.

Business 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 will 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 hours 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
A continuation of Independent Study I.

LG 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

LG 699 Thesis II
A continuation of Thesis I.

Mathematics

M 601 Mathematical Ideas
This course is intended for students in the MS Education program. It surveys the development of mathematics through such key topics as geometry, trigonometry, abstract algebra, and the calculus. While topics may vary with individual instructors, all instructors will introduce students to the contributions of mathematics to civilization and give students some understanding of the discipline of mathematics.

M 605 Biostatistics
A non-calculus-based course which 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, including 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 credit hours 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 credit hours 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 the 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 hours 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
A continuation of Independent Study I.

M 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

M 699 Thesis II
A 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 genome, genome evolution, poteomics, 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 will introduce the student to the organization, use, and critical evaluation of scientific information. Print and electronic resources will be explored through lectures, class discussion, and written assignments. Sources evaluated will include basic reference works, journal articles, electronic databases, and the variety of information accessible via the World Wide 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 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 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 will 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 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 basic skills and understanding required for mammalian cell and tissue culture and fundamental techniques in cell biology. Topics will 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 must have access to email prior to the first class. Students will learn how computers and information technology are changing the way biology is done. After reviewing genome structure, gene expression, and the history of the Human Genome Project, the course will cover experimental acquisition of DNA and protein sequence data, DNA sequence and mapping databases, sequence analysis and database searching, gene similarity and homology, protein structure, and protein evolution. Students will gain practical experience using computer applications essential to current biological research.

MB 625 Advanced Bioinformatics

Prerequisites: MB 606 Molecular Genetics/Genomics and MB 620 Bioinformatics and CS 622 Database Systems as corequisite. The aim of this course is to provide students with a detailed overview of the latest computational and scientific developments in Bioinformatics. Students will use a broad set of Bioinformatics software tools and will gain a comprehensive introduction to the theory upon which these tools are based. Students will develop new bioinformatics applications by using real biological data and Perl language. Topics include novel data storage and handling techniques; pattern search techniques through GCG package; development and implementation of new bioinformatics applications using Perl language; analysis of biomolecular structures, dynamics, and functions; and analysis of novel gene expression methods (DNA microarray technology and serial analysis of gene expression-SAGE).

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: 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 will be 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 will monitor the student's progress through regular meetings and evaluation of the final report.

MB 689 Internship II
A 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
A continuation of Independent Study I.

MB 698 Thesis I
Prerequisites: 15 graduate hours and permission of coordinator. Supervised preparation of a thesis describing the student's research.

MB 699 Thesis II
A 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. 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 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
Review of the basic concepts of conduction and radiation. Detailed treatment of laminar, turbulent, free, and forced convectional flows. Computer projects.

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 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 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 hours 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 mechanical engineering or 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
A continuation of Independent Study I.

ME 698 Thesis I
Prerequisite: 18 graduate credit hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

ME 699 Thesis II
A 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 sport enterprise; examination of important contemporary issues in the sports industry.

MG 611 Sport 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 sport industry. Marketing sport as a product and marketing of nonsport products using sport 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 sport. Provides sport managers with the fundamental legal knowledge necessary to operate in the increasingly complex sport 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: booking and scheduling of events, 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 determine the viability and strength of businesses in the sports industries. The focus of the material is on how to apply basic financial management concepts to managerial decision making.

MG 618 College Sports Administration

The major 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 will acquire the practical skills needed to manage a staff of coaches, administrators, student athletes, and other staff. The activities of facility operations, travel, compliance, eligibility, financial aid, personnel, ticket operations, sports camps, and institutional control will be examined.

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 in corporate governance 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 will focus 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 will be attempted. Difficulties arising between theory and practice will be 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 produc-

tivity 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, veteran status.

MG 669 Strategic Management
Prerequisites: completion of all core and at least four of the advanced courses in the MBA 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 numerous elements involved in assuring the fulfillment of the goals of the total organization and integrates the student's general business knowledge with knowledge acquired in the MBA 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 is designed to provide the student with a general understanding of the nature and intent of the 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 will be 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 hours 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. While the exact content of this seminar is expected to vary from trimester to trimester in accordance 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 690 Research Project
Prerequisite: 15 graduate hours or permission of the instructor. Independent study under the supervision of an advisor.

MG 694 Internship
Prerequisite: 24 credits of graduate work. 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
A continuation of Independent Study I.

MG 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

MG 699 Thesis II
A continuation of Thesis I.

MG 801 Dissertation I
Enrollment limited to doctoral students only. Prerequisite: successful completion of the written and oral doctoral comprehensive examination. Periodic meetings and discussions of the individual student's progress in the preparation of the doctoral dissertation.

MG 802 Dissertation II
Enrollment limited to doctoral students only. Continuation of Dissertation I.

MG 803 Dissertation III
Enrollment limited to doctoral students only. Continuation of Dissertation II.

MG 804 Dissertation IV
Enrollment limited to doctoral students only. Continuation of Dissertation III.

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 applied 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 not-for-profit 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 will 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 will 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 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 hours 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
A continuation of Independent Study I.

MK 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

MK 699 Thesis II
A 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 the U.S. national security programs' architecture. Areas covered include the current architecture, 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 the personnel security programs. Specific analysis of behavioral issues and their impact on loyalty and trustworthiness determinations. Students will 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 operations 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, risk management are covered.

NSP 606 Contemporary Issues in National Security Programs
Students will select from a range of topics relating to current issues and concerns within the national security architecture. Each student will be required to write a paper and deliver an oral presentation on a selected topic.

NSP 607 Architecture of Protected Information
Students will review contemporary theories and practices for the identification of information requiring or deserving protection and will evaluate how such protection may be achieved while allowing the use of the information. Contemporary legal principles and regulatory processes will be explored, in both private and governmental sectors. The application of sound information security practices will be reviewed, and program analysis models will be 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. Students will study 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 measures the 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 will 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 be many terrorists; preparedness, detection, treatment, and response during pre-, trans- and post-attack times; government programs to prevent, prepare for, and respond; and legal, economic, mental health, and policy issues. Lecture, discussion, a writing assignment, and a tabletop decision-making simulation will be the teaching methods used. 1 credit.

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 objective 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 that can be made of the Cross-Impact Analysis methodology. Non-traditional, problem-solving evalua-

tion of national security issues will be utilized. Emphasis will be on estimating the likelihood and nature of anticipated events that may influence projected factors. A multidisciplinary approach will be utilized. The focus of the course will be on the implementation of empirically derived strategies in the analysis of national security futures issues.

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 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 the 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 protecting the public from biological and chemical agents that may be used as weapons of mass destruction (WMD). (See also SH 668.)

NSP 669 Weapons of Mass Destruction II: Radiological Agents
Radiological materials pose a serious national security concern. This course will provide an in-depth analysis of the scientific, technological, and policy issues involved in providing protection from the misuse of these agents. (See also SH 669.)

NSP 670 Selected Topics
A study of selected issues of particular interest to the students and instructor.

NSP 690 Research Project I
Individual guidance on a research endeavor.

NSP 691 Research Project II
Individual guidance on a research endeavor.

NSP 693 National Security Internship I
Accepted candidates will be placed on summer assignments within an element (agency or industry) of the U.S. Government's national security program. The student's formal educational development will be complemented by field placement experience in various security settings or agencies. Field experience will be supervised by designated agency and department personnel.

NSP 694 National Security Internship II
The student's formal educational development will be complemented by field placement experience in various security settings or agencies. Field experience will be 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.

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, nucleic acids/nucleotides) with special attention to their biologic roles and nutritional aspects of their metabolism.

NU 602 Nutritional Biochemistry II: Applications
Prerequisite: NU 601. Lectures emphasize integration and control of metabolic pathways and also survey certain areas of biochemistry and molecular biology with 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; 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; 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 director. 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; 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 670 Selected Topics
Prerequisite: 15 graduate hours or permission of program director. A study of selected issues of particular interest to the students and instructor.

NU 690 Research Project
Prerequisite: 15 graduate hours or permission of program director. Independent research/project carried out under the supervision of a faculty advisor and resulting in a written research report in the area of human nutrition.

NU 695 Independent Study
Prerequisite: 15 graduate hours or permission of program director. 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. Changing professional roles. Community organization and human service delivery; strategies of intervention and community change.

P 607 Special Problems in Community Psychology
Theory and practice of community psychology with selected problems, populations, and settings. Emphasis on community psychology service issues and problems in the Connecticut area.

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. A systematic study of the processes involved in planning, implementing, and evaluating organizational programs. Focus on action research strategies which integrate the entire process from planning to evaluation of the program.

Practicum Seminars and Fieldwork (P 611 - P 616):
An apprenticeship or on-the-job role in an ongoing program or center. Emphasis on developing conceptualizations and insights as a result of involvement in the apprenticeship. Placement at a field site for 8 to 10 hours per week. Weekly class meetings serve two purposes: to present specific 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 each student will analyze and integrate fieldwork experience with relevant research and coursework.

P 611 Individual Intervention Seminar
An examination of strategies for providing direct helping services to individuals in 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. 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 jointly provided by the field setting and the psychology department. Students must be available for at least one day per week.

P 615 Consultation Fieldwork
Prerequisite: permission of instructor. Supervised field training in the development of consul-

tation skills. Supervision is jointly provided by the field setting and the psychology department. Students must be available for 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 jointly provided by the field setting and the psychology department. Students must be available for 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 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, culture. Issues of class, ethnicity, gender, age, etc. Applications of theory and research to community treatment and prevention.

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 the theories and issues of personality assessment. Includes intelligence, achievement, and ability assessment. Personality tests and ethical questions associated with psychological testing. 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 illness, retardation, 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, 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 will learn how 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 and P 619. An examination of the professional psychologist at work in organizations. Regular subjects include measurement methods, prediction, validation, selection, training and employee assistance programs, group dynamics, organizational change, stress, performance appraisal. Practitioners in business, industry, research organizations, and government will provide insights into the application of psychological principles and methods.

P 646 The Psychology of Conflict Management II
Prerequisite: P 643. Students will be trained in basic negotiation and mediation skills with supervised practice of these skills. Skill development will enable students to resolve conflicts more effectively as well as 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, and CJ 605. 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, psychoses, pedophilia and other sexual paraphilias. Special emphasis on psychopathy, psychopathology, criminal behavior, and Hans Toch's work on psychopathology created in prison settings. Well-known forensic cases will be examined. This course is a prerequisite for all other courses in the Forensic Psychology sequence. (See also CJ 646.)

P 657 Forensic Assessment & Outcome Evaluation
Prerequisites: CJ 601, CJ 605, and CJ 646. This course will review the spectrum of assessment instruments used in evaluation and treatment in inmate and patient settings. Pros and cons of forensic interviewing will be examined. Emphasis on ability to assess violence and risk will be included. Students will come to understand the strengths and limitations of a wide variety of clinical assessment tools. Special concentration on techniques to assess malingering will be examined. (See also CJ 647.)

P 658 Forensic Treatment Models
Prerequisites: CJ 601, CJ 605, CJ 646, and CJ 647. This course will examine 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 will be covered. Treatment of insanity acquittees, incompetent-to-stand-trial patients, inmates, juvenile offenders, psychopaths, and sex offenders will be examined. Management of high-risk forensic populations will be covered. Particular emphasis will be placed on current research find-

ings 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
A 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
A continuation of Organizational Internship I.

P 695 Individual Intensive Study I
Prerequisites: completion of required courses or 24 graduate hours and written approval of department chair. Provides the graduate student with the opportunity to delve more deeply into a particular area of study under faculty supervision.

P 696 Individual Intensive Study II
A continuation of Individual Intensive Study I.

P 698 Thesis I
Prerequisites: completion of all required courses or 24 graduate hours and written approval of department chair. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

P 699 Thesis II
A 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 is studied. The implementation of public policy by administrators based on the politics of the administrator is examined in terms of interaction between various 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 prerequisite: 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 prerequisite: PA 601. Study of the civil service systems in the United States and the 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 which 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 prerequisite: 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 for the promotion of 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 prerequisite: 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 prerequisite: 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 prerequisite: 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 will be 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 which affect the administration of human service organizations will be studied, with emphasis on administration of health care services.

PA 645 Health Care Economics and Finance

Recommended prerequisite: 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 will view current videotapes, work on case studies, participate in class exercises, and present several reports. Current articles illustrate the issues under discussion.

PA 649 History and Development of Health Care Institutions

Historical development of health care institutions and its effect on their current economic and social status.

PA 651 Health Care Ethics

Explores and defines a wide spectrum of critical ethical issues; factors that should be considered in resolving these issues; 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. 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 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, 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 662 Recruitment and Retention of Health Care Professionals
The purpose of this course is to provide the health professional with theories and methods to recruit and retain the health care professional in the health care setting. As well as preparing health professionals who actually recruit health care professionals, it will also provide those not in the recruitment role an understanding of various methods and techniques to retain professionals working in their departments.

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 internships staterequired for eligibility to take the State of Connecticut licensing examination in long-term care administration. Course is composed of a 450-hour nursing home internship.

PA 682 Long-Term Health Care Internship II
A continuation of Long-Term Health Care Internship I.

PA 683 Long-Term Health Care Internship
Prerequisite or corequisite: PA 646. Course is composed of 500 hours in a skilled nursing facility. This course is available only to students who will 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 prerequisite: PA 611. Requirements include a major 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 hours and permission of the public administration graduate program coordinator. A supervised work experience in a cooperating public service agency. Students must be available for 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
A continuation of Independent Study I.

PA 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

PA 699 Thesis II
A 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 will focus 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 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 relation 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 of 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, 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. Offense against the person, 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. Stress 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, the 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 the 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. Stress 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, neighborhood corporations, etc.).

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 influence of intelligence, economic, and psychological factors and social pressure on decisions and decision makers will be 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 the 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, students' 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
A 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 theory, and nonparametric tests including chi-square. Students will use computers to conduct statistical tests using the information presented.

QA 605 Applied Statistics
A continuation of 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; will include 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 and 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 the selection of the best investment criteria, the 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 hours 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
A continuation of Independent Study I.

QA 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

QA 699 Thesis II
A continuation of Thesis I.

Occupational Safety and Health

SH 602 Safety Organization and Administration
Intensive study of the occupational safety and health field as it currently exists. History and growth of industrial safety. Motivational and psychological aspects of accident prevention. Legal aspects of safety, including worker compensation and state and federal regulations. Engineering needs. Development of voluntary standard systems. Fire prevention, industrial hygiene, and future directions.

SH 605 Industrial Safety Engineering
An analysis of the major physical hazards in industrial work and the attendant safety practices employed to eliminate hazardous conditions or minimize the likelihood and extent of injury. Includes the hazards associated with machinery, combustion, electricity, materials handling, and fire.

SH 608 Industrial Hygiene Practices
Prerequisite: introductory chemistry. Recognition of the magnitude and extent of the health hazards characteristic of industrial work. An evaluation of the danger, the control of hazards, and the protection of the worker.

SH 611 OSH Research Methods and Techniques
The students and OSH faculty will meet once a week throughout the trimester. The student will select a topic directly related to occupational safety and health, conduct a literature search, do a research project, and prepare and defend a mini-thesis.

SH 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. (See also EN 615.)

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 the legal pitfalls and the human concerns inherent in the marketing and consumption of goods: seller's responsibility, product liability, insurance, labeling requirements. The Consumer Product Safety Act and related acts, the procedures for minimizing legal risk and maximizing human safety and health.

SH 660 Industrial Ventilation
A thorough study of industrial ventilation systems including theory of design, air pollution control, life-cycle costs, automatic controls, instrumentation, relevant codes and standards, and the evaluation of system performance.

SH 661 Microcomputers in Occupational Safety and Health
Introductory course on using microcomputers in occupational safety and health. Instruction in techniques used for data processing, statistical analysis, interfacing with instrumentation, and linking with mini- and mainframe computers.

SH 665 Industrial Hygiene Measurements
Theory and practice of current methods and techniques applicable to industrial hygiene. Experiments in ventilation, nonionizing radiation, measurement of airborne contaminants, noise and heat stress.

SH 667 Control of Occupational Health Hazards
Advanced study of methodologies used to control exposure to those workplace agents which cause illness and/or disease. Primary focus on techniques used to minimize employee exposures; full discussion of personal protective devices.

SH 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). (See also NSP 668.)

SH 669 Weapons of Mass Destruction II: Radiological Agents
Radiological materials pose a serious national security concern. This course will provide an in-depth analysis of the scientific, technological, and policy issues involved in providing protection from the misuse of these agents. (See also NSP 669.)

SH 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

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
A continuation of Research Project I. 1-3 credits

SH 693 OSH Internship I
Coordinated with local industry or governmental agencies. Practical problems in occupational safety or industrial hygiene and approaches to solving these problems under the supervision of a practicing professional. At the end of the project the student will prepare a report and present it to the OSH faculty for grade evaluation. 1-3 credits

SH 694 OSH Internship II
A continuation of Internship I. 1-3 credits

SH 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty. 1-3 credits

SH 696 Independent Study II
A continuation of Independent Study I. 1-3 credits

SH 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

SH 699 Thesis II
A continuation of Thesis I.

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 abilities 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
Basic introduction to the field of gerontology. Discusses the history and definition of the field, the contributions of academic disciplines to the field, 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 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
A continuation of Independent Study I.

SO 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

SO 699 Thesis II
A continuation of Thesis I.

Tourism and Hospitality Management

THM 616 Advanced Financial Management and Policy Analysis for Hospitality and Tourism
This course takes the experienced hospitality student through the certification process for designation as a Certified Hospitality Account Executive (CHAE) and includes the certification exam as a portion of the course and final grading process. Additionally, membership in the Hospitality Financial and Technology Professional (HFTP) is part of the course. Topics covered include investment trends and analysis, lease and purchase issues, working capital finance, audit and financial management, and CHAE exam preparation.

THM 901 Orientation and Communication
Introduction to the executive tourism and hospitality management program, including instructions on standards of written and oral communication for all course modules. Communication skills needed for success in a professional tourism and hospitality organization are examined. Communication tactics of persuasion, conflict, perception, and change used by management are emphasized. Communication competency is gained through activities and assignments that require interpersonal communication, listening skills, interviewing, speeches, public presentations, negotiations, and meeting communication in hospitality/tourism settings.

THM 902 Philosophy of Service and Operations Strategy
Philosophy of service from management, leadership, and marketing perspectives. Theories, concepts, and modules as well as industry-based procedures are studied as they relate to successful service-oriented tourism and hospitality businesses. The course provides a solid foundation in the important aspects of hospitality and tourism organization operations, including human resources, guest services, marketing, maintenance, and industry trends.

THM 903 Organizational Development and Human Resource Strategies
Examination of human resource skills necessary for successful operation of hospitality and tourism facilities. Includes applications of organizational behavior and development, training, supervision, evaluation, motivation and morale, leadership, and union-management relations.

THM 904 Dimensions of Tourism in the Global Marketplace
Study of the economic, social, political, and environmental impacts of tourism from a global perspective. The roles of transportation, hotels, restaurants, attractions, and tourism promotion organizations are investigated, along with planning and development concerns, fundamental changes, and emerging trends. Integration of issues is achieved through international and domestic case study analysis.

THM 905 National and International Strategic Marketing for Senior Level Management
Strategic approach to the management of the marketing function in the hospitality/tourism business. The traditional departmental responsibilities of internal and external analysis, operations, strategies, action plans, and controls; marketing interaction with the business's strategic plan to produce effective organizational change. Marketing as a set of principles that directs the company in decision making to satisfy customers. Focus on the dramatic and swift changes in international markets and the need for managers to be adaptable and prepared for change.

THM 906 Financial Resource Development and Preservation
Analysis of financial systems and control methodologies. Emphasis on current trends and problems facing the industry. Mergers, acquisitions, and profitability are stressed.

THM 907 Law and Taxation for Profit/Non-Profit Organizations
Review of the contemporary legal issues in employee, guest, and vendor relations. Examines legal and tax issues for not-for-profit organizations, often found in the tourism sector, and taxation issues of hospitality transactions. Contemporary issues of risk related to hospitality and tourism are examined.

THM 908 Government–Business Relations and Ethics
Impacts of government regulation on the hospitality and tourism sector. Cooperative partnerships forged by governments and the tourism/hospitality industry. Differences in government and business relations and regulations from one country to another and their role in destination development. Current ethical issues being debated in the tourism and hospitality arena. Exploration of where ethical decision-making responsibility belongs in hospitality and tourism dilemmas.

THM 909 Leadership and Problem Solving
Holistic approach to various leadership styles based on personal value systems. Classical leadership and management models are applied through a problem-solving approach to hospitality and tourism. Current issues, great leaders, and global citizenship are examined.

THM 910 Special Topics: Current Issues/Future Trends
An in-depth examination of current issues in tourism and hospitality with a global perspective. Investigation of future trends in the context of finances, operations, management, marketing, regulation, and employment. This course is the final module and will build on previous course knowledge, explore areas of interest, and prepare students for the comprehensive examination.

THM 911 Tourism and Hospitality Internship
Structured, hands-on work experience in a tourism or hospitality operation. Students work under the supervision of both a faculty member and personnel at the operation.

THM 912 Research Project I
A structured, individual research project under the supervision of a faculty advisor; course may include both classroom presentation/discussion and independent research.

THM 913 Research Project II
A continuation of Research Project I.

THM 914 Independent Study I
A planned program of individual study under the supervision of a faculty member.

THM 915 Independent Study II
A continuation of Independent Study I.

THM 916 Thesis I
Periodic meetings and discussion of the individual student's progress in the preparation of a master's thesis.

THM 917 Thesis II
A continuation of Thesis I.

THM 920 Strategies for Event Planning
Prerequisite: THM 901 or consent of 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 will be addressed.

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George, Edward T., Professor Emeritus, Computer Science
BS, MS, Worcester Polytechnic Institute; DEngr, Yale University

Gere, William S., Jr., Professor Emeritus, Industrial Engineering
BME, MSIE, Cornell University; MS, PhD, Carnegie Mellon University

Kirwin, Gerald J., Professor Emeritus, Electrical Engineering
BS, Northeastern University; MSEE, Massachusetts Institute of Technology; PhD, Syracuse University

Martin, John C., Professor Emeritus, Civil Engineering
BE, ME, Yale University

Marx, Paul, Professor Emeritus, English
BA, University of Michigan; MFA, University of Iowa; PhD, New York University

Maxwell, David A., Professor Emeritus, Criminal Justice
MA, John Jay College of Criminal Justice; BBA, JD, University of Miami

Mentzer, Thomas, Professor Emeritus, Psychology
BS, Pennsylvania State University; PhD, Brown University

Moffitt, Elizabeth J., Professor Emeritus, Visual and Performing Arts
BFA, Yale University; MA, Hunter College

Reams, Dinwiddie C., Jr., Professor Emeritus, Science and Humanities *(deceased)*
BChE, University of Virginia; MEng, DEng, Yale University

Robillard, Douglas, Professor Emeritus, English
BS, MA, Columbia University; PhD, Wayne State University

Ross, Bertram, Professor Emeritus, Mathematics *(awarded posthumously)*
MS, Wilkes College; MS, PhD, New York University

Smith, Warren J., Professor Emeritus, Management and Quantitative Analysis
BS, University of Connecticut; MBA, Northeastern University

Staugaard, Burton C., Professor Emeritus, Science and Biology
AB, Brown University; MS, University of Rhode Island; PhD, University of Connecticut

Surti, Kantilal K., Professor Emeritus, Electrical and Computer Engineering
BE, University of Gujarat, India; MEE, University of Delaware; PhD, University of Connecticut

Theilman, Ward, Professor Emeritus, Economics
BA, PhD, University of Illinois

Tyndall, Bruce, Professor Emeritus, Mathematics
BA, MS, University of Iowa

van Dyke, Elisabeth, Professor Emeritus, Tourism and Travel Administration
BA, University of California, Los Angeles; MA, PhD, Columbia University

Warner, Thomas C., Jr., Professor Emeritus, Mechanical Engineering
BE, Yale University; MS, Massachusetts Institute of Technology

Wheeler, George, Professor Emeritus, Chemistry
BA, Catholic University of America; PhD, University of Maryland

Wright, H. Fessenden, Professor Emeritus, Science and Biology
AB, Oberlin College; MS, PhD, Cornell University

ADMINISTRATION

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Lucy M. Wendland, Executive Secretary

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Silvia I. Hyde, Executive Assistant to the Provost and Vice President for Academic Affairs

Marilou McLaughlin, BA, MA, PhD, President, UNH Foundation

Ira H. Kleinfeld, BS, MS, EngScD, Associate Provost and Dean of Graduate Studies
Jerryl Veneruso, Executive Secretary

Gordon R. Simerson, BA, MA, PhD, University Accreditation Officer and Associate Dean of the College of Arts & Sciences

Julian Schuster, BA, MA, PhD, Dean of Extended and Executive Education
Linda Carlone, BA, MS, Associate Director, Executive MBA Program

Academic Services

Kathryn H. Cuozzo, BS, MS, Director of the office of Academic Services
Rosalie S. Swift, BS, Coordinator of Academic Services and University Omsbudsman

Marvin K. Peterson Library

Hanko H. Dobi, BA, MLS, University Librarian
Anne O'Connor, BA, MA, MLS, Head of Access Services
Veena Mishra, BA, MLS, Head of Reference
Marion Hamilton Sachdeva, BA, MSLS, Head of Technical Services
Christine Archambeault, BLA, MLS, Reference Librarian
Robert Belletzkie, ALB, MLS, Reference Librarian

The Graduate School

Ira H. Kleinfeld, BS, MS, EngScD, Associate Provost and Dean of Graduate Studies
Jerryl Veneruso, Executive Secretary

College of Arts & Sciences

Daniel N. Nelson, BA, MA, PhD, Dean
Robert D. Greenberg, BA, MA, MPhil, PhD, Associate Dean
Gordon R. Simerson, BA, MA, PhD, Associate Dean
Amanda Glynn, BA, MA, Director of the Center for Learning Resources
Angela J. Flynn, Assistant to the Dean

Graduate Program Coordinators/Directors

Eva Sapi, BS, PhD, Coordinator, Master of Science in Cellular and Molecular Biology
Michael A. Morris, BA, MA, PhD, Coordinator, Master of Arts in Community Psychology
Jacqueline Jacoby, BS, ME, EdD, 6th Year Certificate, Coordinator, Master of Science in Education
Roman N. Zajac, BS, MS, PhD, Coordinator, Master of Science in Environmental Science
Rosa A. Mo, BS, RD, MS, Coordinator, Master of Science in Human Nutrition
Stuart D. Sidle, BA, MA, PhD, Coordinator, Master of Arts in Industrial/ Organizational Psychology
Maiorino, Nicholas, BS, MS, 6th Year Certificate, Coordinator of Interns, Education

Department Chairpersons/Directors

Michael J. Rossi, BS, PhD, Chair, Biology and Environmental Science, Human Nutrition, Dietetics
Sandra D'Amato-Palumbo, BS, MPS, RDH, Director, Dental Hygiene programs
Jacqueline Jacoby, BS, ME, EdD, 6th Year Certificate, Chair, Education
Suzanne Murphy, BA, MA, MS, PD, CAGS, 6th Year Certificate, Director of Student Teaching, Education
Donald M. Smith, BA, MA, PhD, Chair, English
Thomas Katsaros, BA, MA, MBA, PhD, Chair, History and Philosophy
Guillermo Mager, BS, MA, PhD, Chair, Visual and Performing Arts
W. Thurmon Whitley, BS, MA, PhD, Chair, Mathematics and Physics; Director, Honors Program
Natalie J. Ferringer, BS, MA, PhD, Chair, Political Science
John H. Mace, BS, MA, PhD, Chair, Psychology
Mark Kacerik, BS, MS, RDH, Chair, Dental Hygiene

Faculty of the College of Arts & Sciences

Arabolos, John, Assistant Professor, Visual and Performing Arts
BA, University of Hartford; MA, Pratt Institute of Design
Ayers, James, Instructor, Biology and Environmental Science
BS, Southern Connecticut State University; MS, Purdue University
Bell, Srilekha, Professor, English
BA, MA, University of Madras, India; MA, PhD, University of Wisconsin
Bogart, Nelson, Assistant Professor, Visual and Performing Arts
BGS, University of Michigan; MM, New England Conservatory; JD, Benjamin Cardoza School of Law
Bradshaw, Alfred D., Associate Professor, Sociology
BA, PhD, Syracuse University
Carriuolo, Ralf E., Professor, Visual and Performing Arts
BA, Yale University; MM, Hartt School of Music; PhD, Wesleyan University
Celotto, Albert G., Assistant Professor, Visual and Performing Arts
BM, Western Connecticut State College; MM, Indiana University School of Music
Chavent, Georgia, Assistant Professor, Nutrition and Dietetics
BS, University of New Hampshire; MS, Columbia University; RD, Medical College of Virginia
Chepaitis, Joseph B., Professor, History
AB, Loyola College; MA, PhD, Georgetown University

Ciochine, John, Lecturer, Education
BS, Southern Connecticut State College; MA, 6th Year Certificate, Fairfield University
Cuomo, Carmela, Assistant Professor, Biology and Environmental Science
BA, Adelphi University; MPhil, PhD, Yale University
D'Amato-Palumbo, Sandra, Assistant Professor, Dental Hygiene
BS, University of Bridgeport; MPS, Quinnipiac College; RDH
Davis, R. Laurence, Professor, Earth and Environmental Science
AB, AM, Washington University; PhD, University of Rochester
Davis, Wesley J., Senior Lecturer, English
BA, MA, Southern Connecticut State University
DeNardis, Lawrence J., Professor, Political Science; President Emeritus
BS, Holy Cross College; MA, PhD, New York University
Dinegar, Caroline A., Professor, Political Science
BA, Cornell University; MA, PhD, Columbia University
Dull, James W., Professor, Political Science
BA, Wilkes College; MA, University of Pennsylvania; MPhil, PhD, Columbia University
Farrell, Richard J., Senior Lecturer, English
BA, University of Notre Dame; MA, University of Virginia; MPhil, Yale University
Ferringer, Natalie J., Professor, Political Science
BS, Temple University; MA, PhD, University of Virginia
Glen, Robert A., Professor, History
BA, University of Washington; MA, PhD, University of California, Berkeley
Greenberg, Robert, Professor, English
BA, Sarah Lawrence College; MA, MPhil, PhD, Yale University
Griffiths, Matthew, Associate Professor, Physics
BSC, University of Edinburgh; PhD, University of Edinburgh
Grosso, Gwen, Assistant Professor, Dental Hygiene
AS, Hudson Valley Community College; BS, University of New Haven; MS, University of Bridgeport
Guzman, Alexandria, Assistant Professor, Psychology
BS, Seton Hall University; MS, Fordham University; MA, PhD, State University of New York at Binghamton
Hoffnung, Robert J., Professor, Psychology
AB, Lafayette College; MA, University of Iowa; PhD, University of Cincinnati
Hyman, Arnold, Professor, Psychology
BA, MA, Brooklyn College; MS, City College of New York; PhD, University of Cincinnati
Jacoby, Jacqueline, Professor, Education
BS, Slippery Rock University of Pennsylvania; ME, Duquesne University; EdD, Boston College; 6th Year Certificate, Lehigh University
Jafarian, Ali A., Professor, Mathematics
BS, Tehran University; MS, Pahlavi University; PhD, University of Toronto
Jokl, Todd, Instructor, Visual and Performing Arts
BA, Yale University; MA, University of Connecticut
Kacerik, Mark, Assistant Professor, Dental Hygiene
BS, MS, University of Bridgeport; RDH
Kaloyanides, Michael G., Professor, Visual and Performing Arts
BA, PhD, Wesleyan University
Katsaros, Thomas, Professor, History
BA, MA, MBA, PhD, New York University

Keilty, Bernard J., Assistant Professor, Visual and Performing Arts
BA, Chaminade University; MS, Southern Connecticut State University;
MA, Georgetown University
L'Heureux-Barrett, Tara, Assistant Professor, Psychology
BA, State University of New York College at Plattsburgh; MA, PhD, University of Connecticut
Listro, Stephen, Instructor, English
BS, MS, Southern Connecticut State University; MFA, University of Miami
Mace, John H., Assistant Professor, Psychology
BS, Ramapo College of New Jersey; MA, Queens College; PhD, City University of New York
Mager, Guillermo E., Associate Professor, Visual and Performing Arts
BS, MA, PhD, New York University
Marks, Joel H., Professor, Philosophy
BA, Cornell University; MA, PhD, University of Connecticut
Mehlman, Marc H., Associate Professor, Mathematics
BA, University of California, Santa Barbara; MA, PhD, University of California, Riverside
Mercer, Teal, Assistant Professor, Dental Hygiene
AS, University of Bridgeport; BS, Pennsylvania University; MPH, University of Connecticut
Mo, Rosa A., EdD, RD, Instructor, Nutrition and Dietetics
BS, College of the Holy Spirit, Philippines; RD, Yale New Haven Hospital; MS, EdD, Teachers College of Columbia University
Morris, Michael A., Professor, Psychology
BA, MA, PhD, Boston College
Murphy, Suzanne, Lecturer, Education
BA, Fordham University; MA, Yale University; MS, PD, 6th Year Certificate, Southern Connecticut State University
Pepin, Paulette L., Assistant Professor, Education
BA, Western Connecticut State University; MA, PhD, Fordham University
Prajer, Renee, Assistant Professor, Dental Hygiene
BS, MS, University of Bridgeport; RDH
Randi, Judi, Assistant Professor, Education
MA, Wesleyan University; 6th Year Certificate, Columbia University; MLS, Southern Connecticut State University; CAS, Fairfield University; EdD, Teachers College of Columbia University
Rosenthal, Erik, Professor, Mathematics
BA, Queens College, City University of New York; MS, State University of New York at Albany; MA, PhD, University of California, Berkeley
Rossi, Michael J., Associate Professor, Biology and Environmental Science
BS, Xavier University; PhD, University of Kentucky
Sachdeva, Baldev K., Professor, Mathematics
BSc, MA, Delhi University; PhD, Pennsylvania State University
Sandman, Joshua H., Professor, Political Science
BA, MA, PhD, New York University
Sapi, Eva, Assistant Professor, Biology and Environmental Science
BS, Vorosmarty Gymnasium; PhD, Eotvos Lorand University (Hungary)
Sharma, Ramesh, Professor, Mathematics
BS, MS, PhD, Banaras Hindu University, India; PhD, University of Windsor
Sidle, Stuart Daniel, Assistant Professor, Psychology
BA, American University; MA, PhD, DePaul University

Simerson, Gordon R., Professor, Psychology
BA, University of Delaware; MA, PhD, Wayne State University
Sinha, Saion K., Assistant Professor, Physics
BS, MS, Indian Institute of Technology; PhD, University of Kentucky
Sloane, David EE, Professor, English and Education
BA, Wesleyan University; MA, PhD, Duke University
Smith, Donald M., Professor, English
BA, Guilford College; MA, Columbia University; PhD, New York University
Soares, Louise M., Professor, Education
BA, MA, Boston University; PhD, University of Illinois
Somerville, Christy A., Assistant Professor, Visual and Performing Arts
AA, Fullerton College; BA, MA, California State University, Long Beach
Todd, Edmund N., Associate Professor, History
BA, MA, University of Florida; MA, PhD, University of Pennsylvania
Uebelacker, James W., Professor, Mathematics
BA, LeMoyne College; MA, PhD, Syracuse University
Vieira, Marianna M., Lecturer, English
BA, Russell Sage College; MA, State University of New York at Albany; MS, University of Bridgeport
Vigue, Charles L., Professor, Biology and Environmental Science
BA, MS, University of Maine; PhD, North Carolina State University
Voegeli, Henry E., Professor, Biology and Environmental Science
BA, University of Connecticut; PhD, University of Rhode Island
Volonino, Victoria, Instructor, Education
BA, University of Michigan; MEd, University of Missouri
Wakin, Shirley, Professor, Mathematics and Education
BA, University of Bridgeport; MA, PhD, University of Massachusetts
Whitley, W. Thurmon, Professor, Mathematics
BS, Stetson University; MA, University of North Carolina at Chapel Hill; PhD, Virginia Polytechnic Institute and State University
Williams, Brenda, Professor, English and Education
BA, Howard University; MA, PhD, Washington University
York, Michael W., Professor, Psychology
BA, MA, Southern Methodist University; PhD, University of Maryland
Zajac, Roman N., Professor, Biology and Environmental Science
BS, Tufts University; MS, PhD, University of Connecticut

Faculty Professional Licensure and Accreditation

Chavent, Georgia, Registered Dietitian, American Dietetic Association
D'Amato-Palumbo, Sandra, Registered Dental Hygienist, Connecticut
Davis, R. Laurence, Professional Geologist, South Carolina, Kentucky; Certified Professional Geologist, American Institute of Professional Geologists; Certified Professional Hydrogeologist, American Institute of Hydrology; Certified, Wilderness First Aid
Grosso, Gwen, Registered Dental Hygienist, Connecticut
Hoffnung, Robert J., Licensed Psychologist, Connecticut
Hyman, Arnold, Licensed Psychologist, Connecticut
Kacerik, Mark, Registered Dental Hygienist, Connecticut
Mo, Rosa, Registered Dietitian, Certified Dietitian and Nutritionist, Connecticut

Prajer, Renee, Registered Dental Hygienist, Connecticut
York, Michael W., Licensed Psychologist, Connecticut

Practitioners-in-Residence

Abell, Norman, Biology and Environmental Science
BS, Villanova University; DPM, Ohio College of Podiatric Medicine
Antenucci, Margaret, English
BA, MA, Ohio State University
Asmus, Pamela, English
BA, Albertus Magnus College; MA, Wesleyan University; PhD, Brown University
Blakin, Richard, Visual and Performing Arts
Brooklyn College, Dawson College
Brubaker, David, Philosophy
BA, University of Pennsylvania; MFA, Art Institute of Chicago; PhD, University of Illinois
Browe, Kimberly, English
BA, MA, University of Florida
DePodesta, David, Biology
AS Wentworth Institute; BS, University of New Haven; MBA, Quinnipiac University
Glynn, Amanda, English
BA, Wellesley College; MA, University of North Carolina at Chapel Hill
Laskoski, JoAnn, Education
BA, Queens College; MA, University of Connecticut
Maiorino, Patricia, Education
BA, MS, Southern Connecticut State University
McGough, Dennis, Psychology
BS, University of Pittsburgh; MA, University of New Haven; PhD, Union Institute of Chicago
Melillo, Anthony, Biology
BS, University of Connecticut; MS, University of New Haven
Moreggi, Danielle, Psychology
BA, University of New Haven; MS, PhD, Pacific Graduate School of Psychology
Muench, George, Physics
BSE, University of Central Florida; MS, PhD, Clarkson University
Sharp, Arthur, English
BA, University of Hartford; MA, Trinity College
Sherman, Neil, English
BA, University of Toronto; MBA, University of Delaware
Yu, Chien, English
BA, Howard University; MA, PhD, Washington University

School of Business

Jess S. Boronico, BS, MS, PhD, Dean
Anna Pesce, Assistant to the Dean

Graduate Program Directors and Coordinators

Linda Carlone, BS, MS, Associate Director, Executive MBA Program
Richard Laria, BS, MBA, Director, MBA and Accelerated Programs

Charles N. Coleman, BA, MPA, Coordinator, Master of Business Administration (MBA), Master of Public Administration (MPA), Master of Science in Health Care Administration, and Master of Science in Labor Relations

Anshuman Prasad, BA, MBA, PhD, Professor of Management and Director, Doctoral Program (ScD)

Faculty of the School of Business

Allen, Jerry L., Professor, Communication
BS, Southeast Missouri State College; MS, PhD, Southern Illinois University at Carbondale

Anziano, Leon B., Visiting Professor of Management
BS, MS, Cornell University; Executive Management Program, University of Michigan

Berman, Peter I., Professor, Finance
AB, Cornell University; PhD, Johns Hopkins University

Boynton, Wentworth, Assistant Professor, Finance
BA, Colby College; AM, Brown University; MA, MBA, PhD, University of Rhode Island

Coleman, Charles N., Assistant Professor, Public Management
BA, University of Maryland; MPA, West Virginia University

Conrad, Cynthia, Associate Professor, Public Management
BA, Southern Illinois University; MA, PhD, University of Texas at Arlington

Daneshfar, Alireza, Assistant Professor, Accounting
BA, National University; MS, Tehran University; PhD, Concordia University

Downe, Edward, Associate Professor, Finance
BA, Bowling Green State University; MA, PhD, New School for Social Research; APC, New York University

Falcone, Paul C., Instructor, Communication
BS, MBA, University of New Haven

Finn, Dale M., Assistant Professor, Management
BS, MEd, University of Delaware; MBA, PhD, University of Massachusetts

Fried, Gil B., Associate Professor, Sports Management
BS, California State University–Sacramento; MA, JD, Ohio State University

Goldberg, Martin A., Assistant Professor, Accounting
BA, Clark University; MS, Boston University; JD, University of Connecticut; LLM, New York University

Haley, George T., Professor, Marketing
BA, BBA, MBA, PhD, University of Texas at Austin

Judd, Ben B., Professor, Marketing
BA, University of Texas; MS, PhD, University of Texas at Arlington

Kublin, Michael, Professor, Marketing and International Business
BA, Brooklyn College; MA, Indiana University; MBA, Pace University; PhD, New York University

Lane, Scott J., Professor, Accounting
BSBA, University of Massachusetts at Lowell; MS, Texas A & M University; PhD, University of Kentucky

Liang, Jiajuan, Assistant Professor, Quantitative Analysis
BS, MS, Nankai University, PRC; PhD, Hong Kong Baptist University

Martin, Linda R., Professor, Quantitative Analysis
BA, Regis College; PhD, University of South Carolina

McDonald, Robert G., Associate Professor, Accounting
BS, City College of New York; MBA, New York University; CMA, CIA, CFA, CPA

McLaughlin, Marilou, Professor, Communication
BA, MA, Villanova University; PhD, University of Wisconsin

Mensz, Pawel, Associate Professor, Management and Quantitative Analysis
BS, ME, MS, Warsaw Polytechnic; PhD, Systems Research Institute of the Polish Academy of Sciences

Morris, David J., Jr., Professor, Marketing
BS, MS, PhD, Syracuse University

Moscove, Stephen, Professor, Accounting
BS, University of Illinois; MS, University of Illinois; PhD, Oklahoma State University

Nadim, Abbas, Professor, Management
BA, Abadan Institute of Technology, Iran; MBA, University of California, Berkeley; PhD, University of Pennsylvania

Neal, Judith A., Associate Professor, Management
BS, Quinnipiac College; MA, MPhil, PhD, Yale University

Pan, William S. Y., Professor, Quantitative Analysis
BS, National Cheng Kung University, Taiwan; MBA, Auburn University; PhD, Columbia University

Parker, Joseph A., Professor, Economics
BA, Lehigh University; MA, PhD, University of Oklahoma

Phelan, John J., Associate Professor, Economics
BS, MA, Indiana University; PhD, George Washington University

Prasad, Anshuman, Professor, Management
BA (Hons.), University of Delhi; MBA, Xavier Institute, Jamshedpur, India; PhD, University of Massachusetts, Amherst

Rainish, Robert, Professor, Finance
BA, City College, New York; MBA, Bernard M. Baruch College; PhD, City University of New York

Raucher, Steven A., Professor, Communication
BA, Queens College; MS, Brooklyn College; PhD, Wayne State University; JD, Bridgeport School of Law at Quinnipiac College

Rhode, John, Visiting Assistant Professor, Marketing
MBA, Harvard University

Rodriguez, Armando, Associate Professor, Economics
BS, University of Texas; PhD, University of Texas

Rolleri, Michael, Associate Professor, Accounting
BS, University of Bridgeport; MBA, University of Connecticut; CPA

Roy, Subroto, Assistant Professor, Marketing
MS, Birla Institute of Technology and Science; Post Graduate Diploma, Institute of Rural Management, India; PhD, University of Western Sydney, Australia

Sack, Allen L., Professor, Management [and Sociology]
BA, University of Notre Dame; MA, PhD, Pennsylvania State University

Schuster, Julian, Professor, Economics
BA, MA, PhD, University of Belgrade, Yugoslavia

Sencicek, Mehmet, Assistant Professor, Economics
BSBA, University of Nevada–Reno

Shapiro, Steven J., Professor, Economics and Finance
BA, University of Virginia; MA, PhD, Georgetown University

Smith, Donald C., Professor, Communication
BA, Southern Connecticut State University; MS, Emerson College; PhD, University of Massachusetts

Upadhyaya, Kamal, Associate Professor, Economics
BA, Tribhuvan University, Nepal; MA, Thammasat University, Thailand;
PhD, Auburn University
Wang, Cheng Lu, Associate Professor, Marketing and International Business
BA, Shanghai Teachers' University; MA, Southeast Missouri State University;
EdS, University of Georgia; PhD, Oklahoma State University
Werblow, Jack, Professor, Public Administration
BA, Cornell University; MBA, University of Pennsylvania; PhD, University of Cincinnati
Wnek, Robert E., Professor, Tax Law, Accounting, and Business Law
BSBA, Villanova University; JD, Widener University School of Law;
LM, Boston University School of Law; CPA

Faculty Professional Licensure and Accreditation

Fried, Gil B., Member of the California State Bar
McDonald, Robert G., Certified Public Accountant, New York; CMA; CIA; CFA
Parker, Joseph A., Accredited Personnel Specialist; National Panel Member, American Arbitration Association
Rolleri, Michael, Certified Public Accountant, Connecticut
Wnek, Robert E., Certified Public Accountant, Connecticut; Member of the Bar, Connecticut, Pennsylvania

Practitioners-in-Residence

Dale, Martha, Long-Term Care
BA, Smith College; MPH, Yale University
Puglia, Michael, Accounting
BA, Southern Connecticut State University; MS, University of New Haven

Tagliatela School of Engineering

Zulma R. Toro-Ramos, BS, MS, PhD, Dean
Karen A. Ralph, Assistant to the Dean

Graduate Program Coordinators

Barun Chandra, BS, MS, PhD/**Tahany Fergany,** BSEE, MS, PhD, Coordinators, Master of Science in Computer Science
Bouzid Aliane, BS, MS, PhD, Coordinator, Master of Science in Electrical Engineering
Agamemnon D. Koutsospyros, BS, MS, PhD, Coordinator, Master of Science in Environmental Engineering
Zulma R. Toro-Ramos, BS, MS, PhD, Coordinator, Executive Master of Science in Engineering Management (EMSEM)
Alexis N. Sommers, BME, MSE, PhD, Coordinator, Master of Science in Industrial Engineering, Master of Science in Operations Research, and MBA/MSIE Dual Degree
Konstantine C. Lambrakis, BSEE, MSME, PhD, Coordinator, Master of Science in Mechanical Engineering

Department Chairpersons

Michael J. Saliby, BS, PhD, Chair, Chemistry and Chemical Engineering
M. Ali Montazer, BS, MS, PhD, Chair, Computer Science and Industrial Engineering

Ali M. Golbazi, BS, MS, PhD, Chair, Electrical/Computer Engineering
John J. Sarris, BA, MS, PhD, Chair, Mechanical, Civil, and Environmental Engineering

Faculty of the Tagliatela School of Engineering

Adams, William R., Associate Professor, Computer Science
BSEE, MS, University of New Haven; PhD, University of Connecticut

Aliane, Bouzid, Professor, Electrical and Computer Engineering
BSEE, Ecole Polytechnique d'Alger; MSEE, PhD, Polytechnic Institute of New York

Barratt, Carl, Professor, Mechanical Engineering
BSc, University of Bristol, England; PhD, University of Cambridge, England

Broderick, Gregory P., Professor, Civil Engineering
BS, MS, Northeastern University; PhD, University of Texas

Chandra, Barun, Associate Professor, Computer Science
BS, St. Stephen's College; MS, Colorado State University; MS, University of Rochester; PhD, University of Chicago

Collura, Michael A., Professor, Chemical Engineering
BS, Lafayette College; MS, PhD, Lehigh University

Daniels, Samuel D., Associate Professor, Mechanical Engineering
BS, MS, PhD, Boston University

Eggert, David W., Associate Professor, Computer Science
BS, MS, PhD, University of South Florida

Fergany, Tahany, Professor, Computer Science
BSEE, Cairo University; MS, PhD, University of Connecticut

Fischer, Alice E., Professor, Computer Science
BA, University of Michigan; MA, PhD, Harvard University

Fish, Andrew J., Jr., Professor, Electrical and Computer Engineering
BSEE, Worcester Polytechnic Institute; MS, University of Iowa; MS, St. Mary's University; PhD, University of Connecticut

Frey, Roger G., Professor, Computer Science
BA, Yale College; MS, PhD, Yale University; JD, Yale Law School

Golbazi, Ali M., Professor, Electrical and Computer Engineering
BS, Detroit Institute of Technology; MS, PhD, Wayne State University

Gow, Arthur S., III, Associate Professor, Chemistry and Chemical Engineering
BA, Muhlenberg College; BA, BS, University of Rhode Island; PhD, Pennsylvania State University

Harding, W. David, Associate Professor, Chemical Engineering
BS, MS, Purdue University; PhD, Northwestern University

Horning, Darrell W., Professor, Electrical and Computer Engineering
BS, South Dakota School of Mines; MS, PhD, University of Illinois

Hosay, Norman, Associate Professor, Computer Science
BA, Wayne State University; MS, PhD, University of Wisconsin

Karimi, Bijan, Professor, Electrical and Computer Engineering
BS, Aryamehr University of Technology, Iran; MS, PhD, Oklahoma State University

Kleinfeld, Ira H., Professor, Industrial Engineering
BS, MS, EngScD, Columbia University

Koutsospyros, Agamemnon D., Professor, Civil and Environmental Engineering
BS, MS, National Technical University, Athens; MS, Polytechnic Institute of New York; PhD, Polytechnic University

Lambrakis, Konstantine C., Professor, Mechanical Engineering
BSEE, MSME, University of Bridgeport; PhD, Rensselaer Polytechnic Institute
Luzik, Eddie D., Assistant Professor, Chemistry
BS, Pennsylvania State University; PhD, Bryn Mawr College
Montazer, M. Ali, Professor, Industrial Engineering
BS, MS, PhD, State University of New York at Buffalo
Nocito-Gobel, Jean, Assistant Professor, Civil and Environmental Engineering
BS, Manhattan College; MS, Ohio State University; PhD, University of Massachusetts
O'Keefe, Daniel C., Professor, Electrical and Computer Engineering
BEE, City University of New York; MSEE, Carnegie-Mellon University;
PhD, Worcester Polytechnic Institute
Orabi, Ismail, Professor, Mechanical Engineering
BS, Helwan University, Egypt; MS, State University of New York at Buffalo;
PhD, Clarkson University
Ross, Stephen M., Professor, Mechanical Engineering
BE, New York University; PhD, Johns Hopkins University
Saliby, Michael J., Professor, Chemistry
BS, Union College; PhD, State University of New York at Binghamton
Sarris, John J., Professor, Mechanical Engineering
BA, Hamilton College; MS, PhD, Tufts University
Sommers, Alexis N., Professor, Industrial Engineering
BME, Cornell University; MS, Rutgers University; PhD, Purdue University
Stanley, Richard M., Professor, Mechanical Engineering
BES, Johns Hopkins University; MS, MPhil, PhD, Yale University
Schwartz, Pauline M., Associate Professor, Chemistry
BS, Drexel University; MS, PhD, University of Michigan
Toro-Ramos, Zulma R., Professor, Industrial Engineering
BS, University of Puerto Rico; MS, University of Michigan; PhD, Georgia Institute of Technology
Wall, David J., Professor, Civil and Environmental Engineering
BSCE, MSCE, University of Connecticut; PhD, University of Pittsburgh

Lecturers

DelValle, Eddie, Lecturer, Chemistry
BS, Inter American University of Puerto Rico; MS, Pontifical University
Diesenhouse, Jacalyn, Lecturer, Computer Science
BA, Brooklyn College; MA, Columbia University; MEd, Northeastern University
Gibson, Gregory S., Lecturer, Computer Science
BA, University of Rochester; MS, University of New Haven

Faculty Professional Licensure and Accreditation

Broderick, Gregory P., EIT, Massachusetts
Collura, Michael A., Professional Engineer, Pennsylvania
Daniels, Samuel D., Professional Engineer, Connecticut
Eggert, David W., EIT, Florida
Faigel, Oleg, Professional Engineer, Connecticut
Harding, W. David, Professional Engineer, Indiana
Koutsospyros, Agamemnon D., Professional Engineer, Greece

Lanius, Ross M., Jr., Professional Engineer, Connecticut, New Jersey
Nocito-Gobel, Jean, EIT, New York
Wall, David J., Professional Engineer, Connecticut, Pennsylvania

School of Hospitality & Tourism

Jess S. Boronico, BS, MS, PhD, Dean
James J. Murdy, Coordinator, Executive Master of Science in Tourism and Hospitality Management, BA, MA, PhD, University of Connecticut

Faculty of the School of Hospitality & Tourism

Murdy, James J., Assistant Professor, Tourism Administration
BA, MA, PhD, University of Connecticut
Vlisides, Constantine E., Professor, Hotel and Restaurant Management
BS, Eastern Michigan University; MA, University of Houston–Clear Lake; PhD, University of North Texas

School of Public Safety & Professional Studies

Thomas A. Johnson, BS, MS, DCrim, Dean
William M. Norton, BS, MS, PhD, JD, Associate Dean
Susan Cusano, Assistant to the Dean

Graduate Program Coordinators

Brad T. Garber, BS, MS, PhD, Coordinator, Master of Science in Occupational Safety and Health Management and Master of Science in Industrial Hygiene
Robert E. Massicotte, Jr., BS, MS, Director, Master of Science in Fire Science
William M. Norton, BS, MS, PhD, JD, Coordinator, Master of Science in Criminal Justice
Carol Scherczinger, BA, PhD, Coordinator, Master of Science in Forensic Science

Department Chairpersons/Directors

James J. Cassidy, BA, MA, PhD, JD, Director, Center for Forensic Psychology
Mario T. Gaboury, BA, MA, PhD, JD, Director, Center for the Study of Crime Victims' Rights, Remedies, and Resources; Interim Chair, Professional Counseling
Brad T. Garber, BS, MS, PhD, Chair, Department of Professional Studies; Director, Occupational Safety and Health
Al Harper, BA, PhD, JD, Director, Henry C. Lee Institute of Forensic Science
Thomas A. Johnson, BS, MS, DCrim, Director, Center for Cybercrime and Forensic Computer Investigation; Director, National Security & Public Safety
Robert E. Massicotte, Jr., BS, MS, Director, Fire Science
Lynn Monahan, BA, MA, PhD, Chair, Criminal Justice
Donna Decker Morris, BS, JD, Director, Legal Studies
Timothy Palmbach, MS, JD, Director, Forensic Science

Faculty of the School of Public Safety & Professional Studies

Adcock, James M., Assistant Professor, Criminal Justice
BA, Lambuth College; MPA, Jacksonville State University; PhD, University of South Carolina
Cassidy, James J., Associate Professor, Criminal Justice
PhD, Hahnemann University; JD, Villanova University—School of Law

Cohen, Howard J., Professor, Occupational Safety and Health
BA, Boston University; MPH, PhD, University of Michigan

Dunston, Nelson, Assistant Professor, Fire Science
BA, St. Mary's College of Maryland; MS, University of Maryland College Park

Gaboury, Mario T., Associate Professor, Criminal Justice
BA, University of Connecticut; MA, University of Maryland; PhD, Pennsylvania State University; JD, Georgetown University Law Center

Garber, Brad T., Professor, Occupational Safety and Health
BS, MS, Drexel University; PhD, University of California, Berkeley

Gorski, Azriel, Assistant Professor, Forensic Science
MS, The Bloomsburg State College; PhD, The Hebrew University of Jerusalem

Harris, Howard A., Associate Professor, Forensic Science
AB, Western Reserve University; MS, PhD, Yale University; JD, St. Louis University Law School

Iliescu, Sorin, Assistant Professor, Fire Science
BSME, University of Bucharest, Romania; MS, University of New Haven

Johnson, Thomas A., Professor, Criminal Justice and National Security & Public Safety
BS, MS, Michigan State University; DCrim, University of California, Berkeley

Lawlor, Michael P., Assistant Professor Criminal Justice
BA, University of Connecticut; JD, George Washington University; MA, University of London

Lee, Henry C., Professor Forensic Science
BA, Taiwan Central Police College; BS, John Jay College of Criminal Justice; MS, PhD, New York University

Massicotte, Robert E., Jr., Assistant Professor, Fire Science
BS, MS, University of New Haven

Monahan, James, Associate Professor, Criminal Justice
BS University of New Haven; MS, PhD, Florida State University

Monahan, Lynn, Professor, Criminal Justice
BA, McGill University; MA, PhD, University of Oregon

Morris, Donna Decker, Assistant Professor, Legal Studies
BS,Tufts University; JD, Yale Law School

Norton, William M., Professor, Criminal Justice
BS, Louisiana State University; MS, University of Southern Mississippi; MS, PhD, Florida State University; JD, University of Connecticut School of Law

O'Connor, Martin J., Associate Professor, Fire Science
BA, University of New Haven; MDiv, Yale University; JD, University of Connecticut School of Law

Palmbach, Timothy, Associate Professor, Forensic Science
BS, MS, University of New Haven; JD, University of Connecticut School of Law

Parker, L. Craig, Jr., Professor, Criminal Justice
AB, Bates College; MEd, Springfield College; PhD, State University of New York at Buffalo

Robin, Gerald D., Professor, Criminal Justice
BA, Temple University; MA, PhD, University of Pennsylvania

Scherczinger, Carol, Associate Professor, Forensic Science
BA, Cornell University; PhD, University of Connecticut

Sedelmaier, Christopher, Assistant Professor, Criminal Justice
MA, PhD, Rutgers University—School of Criminal Justice

Smith, Frederick P., Professor, Forensic Science
MS, University of Pittsburgh; PhD, University of Pittsburgh

Tafoya, William L., Professor, Criminal Justice and National Security & Public Safety
BS, San Jose State University; MPA, University of Southern California;
PhD, University of Maryland

Clinical Instructor

Polio, Joseph, Criminal Justice
BS, MS, University of New Haven

Faculty Professional Licensure and Accreditation

Cohen, Howard J., Certified in the Comprehensive Practice of Industrial Hygiene
Gaboury, Mario T., Attorney at Law, Connecticut; Connecticut Bar Association
Garber, Brad T., Certified in General Toxicology, Certified in the Comprehensive Practice of Industrial Hygiene, Certified Safety Professional
Haskins, Mark B., Certified Safety Professional
Massicotte, Robert E., Jr., Certified Hazardous Materials Inspector, Certified Fire Investigator, Certified Fire Code Inspector
Monahan, James, Licensed Psychologist, Connecticut
Monahan, Lynn, Licensed Psychologist, Connecticut, Massachusetts
Norton, William M., Attorney at Law, Connecticut, Georgia; American Bar Association, Connecticut Bar Association
Parker, L. Craig, Jr., Consulting Psychologist, Wisconsin; Certified Psychologist, Province of Alberta, Canada

Practitioners-in-Residence

Carbone, William H., Criminal Justice
BA, Providence College; MPA, University of New Haven
Executive Director, Court Support Services Division, Judicial Branch, State of Connecticut
Galvin, Mary M., Fire Science
BA, Southern Connecticut State University; JD, Columbus School of Law of the Catholic University
Haskins, Mark B., Occupational Safety and Health
BS, State University College at Brockport; MS, University of New Haven
Manager, Safety and Health, Pfizer Groton Production Division
Looney, Martin, Criminal Justice
BA, Fairfield University; MA, University of Connecticut; JD, University of Connecticut School of Law; State Representative, Connecticut
San Pietro, David, Forensic Science
BS, John Jay College of Criminal Justice; MA, Hunter College
Thiel, Maximilian J., Forensic Science
BA, St. Mary's University

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Allswede, Michael P., National Security & Public Safety
DO, College of Osteopathic Medicine and Surgery; BA, Kalamazoo College
DeBell, Robert, National Security & Public Safety
PhD, St. John's University
Miller, Gary, Distinguished Special Lecturer & Internship Coordinator, National Security & Public Safety
BA, California State University, Sacramento

Miller Coyle, Heather, Forensic Science
MS, University of New Hampshire; PhD, University of New Hampshire
Justice Fred K. Morrison, National Security & Public Safety
BS, Purdue University; JD, College of William and Mary
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JD, University of California, Hastings College of Law
Painter, Charles N., National Security & Public Safety
PhD, Virginia Polytechnic Institute and State University
Vasquez, Lewis, Center for Forensic Computer Investigation
BA, Norwich University; MPA, MBA, University of Hartford
Watson, Samuel J., National Security & Public Safety
MA, The George Washington University
Wilkinson, Edward S., National Security & Public Safety
MS, National Defense University

California Campus Faculty for the School of Public Safety & Professional Studies

Thomas A. Johnson, BS, MS, DCrim, Dean
Colleen R. Johnson, BS, Director, Student Enrollment Management
DeHaan, John, Forensic Science
BS, University of Illinois at Chicago Circle; PhD, University of Strathclyde, Scotland
Jarzen, Robert, Coordinator, Forensic Science
BS, Northern Illinois University; MS, Arizona State University

Research Professor

Cohen, Fred, National Security & Public Safety
PhD, University of Southern California

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Mayfield, Ross, Practitioner-in-Residence, Forensic Science
MBA, Pepperdine University

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Miller, Gary, Distinguished Special Lecturer & Internship Coordinator, National Security & Public Safety
O'Maley, Thomas, Forensic Science
BS, Boston College

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Tippit, John, Program Manager, National Security & Public Safety
AA, Santa Barbara City College

Virginia Campus Distinguished Special Lecturer

Donlon, Matt, Program Manager, National Security & Public Safety
BS, Radford University

Center for Cybercrime and Forensic Computer Investigation

Anderson, Michael, Teaching Affiliate and Professional Practitioner
BS, Weber State University
President, New Technologies, Inc.
Cotton, Fred, Teaching Affiliate and Professional Practitioner
AS, Yuba College
Director, Training Services and Technology Program, SEARCH Group: National Consortium for Justice Information and Statistics
Donlon, Matthew, Teaching Affiliate and Professional Practitioner
BS, Radford University
Former Director, Computer Security, NSA
Giovagnoni, Robert, Teaching Affiliate and Professional Practitioner
Former Chief Counsel; President, Critical Infrastructure Group; Executive Vice President, I-Defense
Kelso, Robert, Teaching Affiliate and Professional Practitioner
Retired Internal Revenue Service, Criminal Investigation Division
Lewis, Glen, Teaching Affiliate and Professional Practitioner
BS, California State University–Sacramento
Malinowski, Christopher, Teaching Affiliate and Professional Practitioner
BS, John Jay College of Criminal Justice; MS, C.W. Post Campus, Long Island University
Manson, Kevin, Teaching Affiliate and Professional Practitioner
BA, University of Washington; JD, University of South Dakota
Computer Crime Instructor, Federal Law Enforcement Training Center
Menz, Mark, Teaching Affiliate and Professional Practitioner
BS, California State University–Sacramento
Menz, Michael, Teaching Affiliate and Professional Practitioner
BS, California State University–Sacramento
Spernow, William, Teaching Affiliate and Professional Practitioner
BS, MBA, California State University–Sacramento

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Center for Learning Resources: Amanda Glynn, BA, MA, Director
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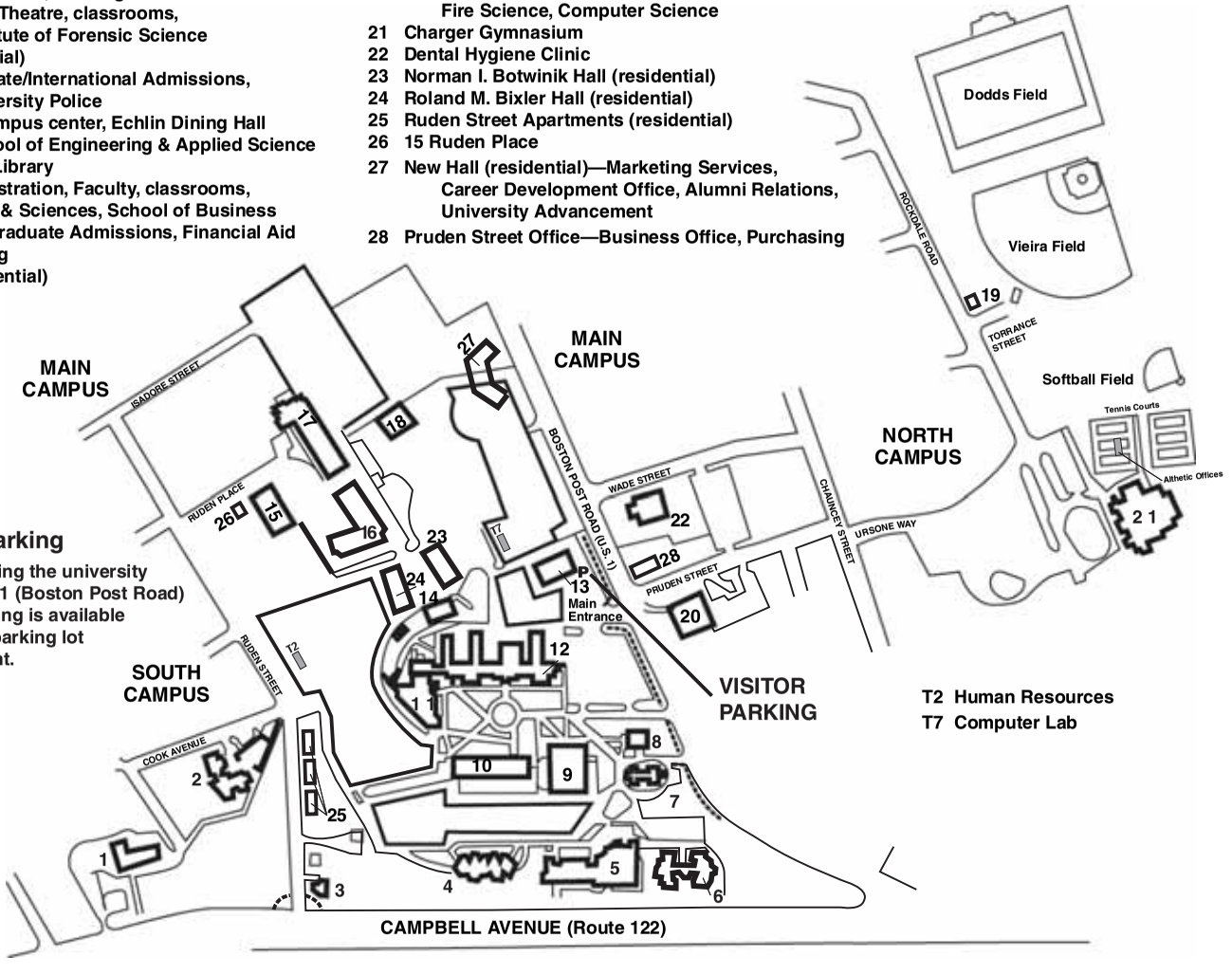
CAMPUS MAP KEY

1 Harugari Hall—The Tagliatela School of Hospitality & Tourism
2 South Campus Hall—School of Public Safety & Professional Studies, Registrars
3 1124 Campbell Avenue—Facilities
4 Kaplan Hall—Classrooms, Evening Studies
5 Dodds Hall—Dodds Theatre, classrooms, Henry Lee Institute of Forensic Science
6 Bethel Hall (residential)
7 Gate House—Graduate/International Admissions,
8 Campus Store, University Police
9 Bartels Hall—the campus center, Echlin Dining Hall
10 Buckman Hall—School of Engineering & Applied Science
11 Marvin K. Peterson Library
12 Maxcy Hall—Administration, Faculty, classrooms, College of Arts & Sciences, School of Business
13 Bayer Hall—Undergraduate Admissions, Financial Aid
14 Psychology Building
15 Dunham Hall (residential)
16 Sheffield Hall (residential), Health Services
17 Winchester Hall (residential)
18 Arbeiter Maenner Chor (student events)
19 Athletic Offices
20 Echlin Hall—EMBA, Computer Center, Fire Science, Computer Science
21 Charger Gymnasium
22 Dental Hygiene Clinic
23 Norman I. Botwinik Hall (residential)
24 Roland M. Bixler Hall (residential)
25 Ruden Street Apartments (residential)
26 15 Ruden Place
27 New Hall (residential)—Marketing Services, Career Development Office, Alumni Relations, University Advancement
28 Pruden Street Office—Business Office, Purchasing



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