

2003

## Graduate Catalog, 2003-2004

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# CONTENTS

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Introduction .....	3
Academic Calendar .....	4
Board of Trustees, Officers of Administration, and Groups .....	5
General Information .....	7
Graduate Education and Research: History .....	7
Special Facilities .....	7
Admission .....	8
Advisory System .....	10
Fees and Expenses .....	11
Assistantships, Fellowships, and Other Aid .....	15
University Programs and Services .....	24
Registration .....	27
Standards and Degree Requirements .....	29
Graduate Certificate Programs .....	30
The Master's Degree .....	30
The Doctor of Musical Arts Degree .....	32
The Doctor of Philosophy Degree .....	34
Conferral of Degrees .....	37
Fields of Study .....	38
Health Center Programs .....	40
Interdisciplinary Programs .....	41
Programs and Course Offerings .....	42
Graduate Faculty .....	195
Research Professors and Research Scientists .....	208
Adjunct Faculty in the Graduate School .....	209
Emeritus Faculty and Staff .....	210
Appendix: Academic Integrity in Graduate Education and Research .....	214
Index .....	217



## UNIVERSITY ACCREDITATION

The University of Connecticut is accredited by the New England Association of Schools and Colleges.

## AFFIRMATIVE ACTION POLICY

The University of Connecticut policy prohibits discrimination in education, employment, and in the provision of services on account of race, ethnicity, religion, sex, age, marital status, national origin, ancestry, sexual orientation, disabled veteran status, physical or mental disability, mental retardation, and other specifically covered mental disabilities.

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# INTRODUCTION

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The University of Connecticut is a resource for the future, both for the State of Connecticut and for the students who enroll in its programs. The emphasis at this University is on choice: The University of Connecticut can be anything students want it to be – it's a matter of taking advantage of the wealth of opportunities made available. The many programs described in this Catalog reflect a dynamic University, that is both constant and constantly growing. The University grows by responding to challenges, opportunities, and needs. What remains constant at the University's core is its steady commitment to high quality teaching, research, and public service.

Each year, a new class of competitively selected undergraduate and graduate students brings to the University the promise and potential for their futures. They are the vital natural resource from which greater resources grow; as they progress, the University gains strength. Each year, courses are added, dropped, and improved as the faculty of more than 1,100 teacher-scholars strives to build a stronger curriculum that will challenge these students to think logically and creatively while they gain insight, experience, and skills to realize their academic objectives. Each year, the University develops new approaches to enlarge and enhance growth experiences outside the classroom and laboratories. Each year, this Catalog records the growth in one of the nation's major public research universities.

Today's University – with nearly 26,000 students, approximately 162,500 alumni, about 125 major buildings and 3,100 acres in and around Storrs, three professional schools and five regional campuses in other parts of the State, and total library holdings of nearly three million volumes – is a far cry from the institution in its first days.

In April 1881, the Connecticut General Assembly established the Storrs Agricultural School after accepting a gift of 170 acres of land, several frame buildings, and money from Charles and Augustus Storrs. The Storrs brothers were natives of Mansfield, the eastern Connecticut town in which the University is located. The School opened on September 28, 1881, with twelve students in the first class. Growth and change came fast in the early years. Before the turn of the century there were two name changes, to Storrs Agricultural College in 1893 and to Connecticut Agricultural College in 1899. In 1933, two years after the institution celebrated its fiftieth anniversary, it became Connecticut State College, a name more in keeping with its steady advances and broadened mission. Six years later, in 1939, the General Assembly designated the institution the University of Connecticut, an acknowledgement of the institution's developing importance to the State in graduate and professional education, research, and public service.

Since the historic legislative act of 1881, the University has grown steadily and dramatically to fulfill its mandated objectives as a provider of high quality education and public service and as a contributor to society through research. The University has reached out with services to all parts of the State, and it has promoted cultural enrichment by making the main campus a center for the arts in Connecticut.

The Jorgensen Center for the Performing Arts on the Storrs campus regularly schedules internationally prominent symphony orchestras, musical soloists and chamber groups, dance companies, and touring dramatic productions. This is complemented by Department of Music recitals in von der Mehden Hall and by Department of Dramatic Arts productions. The William Benton Museum of Art has been acclaimed as one of Connecticut's finest art museums; the diversity and quality of its exhibitions contribute to the vitality of the arts at the University.

The University stands with the leading institutions of the nation in the size, scope, and contributions of its research involvement. In the last ten years, University researchers at Storrs and at the Health Center in Farmington have attracted nearly one billion dollars in support of their work.

For more than a million Connecticut citizens each year, the University is more than classroom and laboratories, cultural presentations and athletic contests; it is direct contact with University people working through institutes, centers, extension services, and extended and continuing education programs in all 169 cities and towns in Connecticut.

The University's public service mission, which has grown apace with academic offering and research endeavors in both scope and importance, reaches out into local government offices and schools, into pharmacies and medical offices, into corporate laboratories and small business showrooms, onto farm lands and fishing boats. Each year, new programs evolve to meet newly identified needs in Connecticut.

The pages of this Catalog contain many of the elements of a university mission that remains constant, of an academic program that is dynamic, and of a commitment to excellence by a university and its faculty, staff and students.

# GRADUATE SCHOOL CALENDAR

## SUMMER SESSIONS 2003

**Note:** Detailed information may be obtained from the Office of Credit Programs, College of Continuing Studies.

Mon.	May	5	Last day for mail, fax, and internet registrations for Session One without late fee(s)
Fri.	May	9	Last day for in-person registrations for Session One without late fee(s)
Sun.	May	18	Graduate Commencement Ceremony 2003
Mon.	May	19	Session One begins at all locations
Mon.	May	26	Memorial Day holiday (no classes)
Mon.	June	16	Last day for mail, fax, and internet registrations for Session Two without late fee(s)
Fri.	June	20	Last day for in-person registrations for Session Two without late fee(s)
Fri.	June	27	Session One ends
Mon.	June	30	Session Two begins at all locations
Fri.	July	4	Independence Day (no classes)
Fri.	Aug.	8	Session Two ends

## FALL SEMESTER 2003

Mon.	Aug.	25	Fall semester classes begin
Mon.	Sept.	1	Labor Day (no classes)
Mon.	Sept.	8	Last day to to complete course registration without penalty fee(s) Last day to drop a course without "W" (Withdrawal) PeopleSoft course registration system closes
Mon.	Oct.	27	Last day for graduate students to drop a course without major advisor's written recommendation and Graduate School permission
Fri.	Nov.	21	Last day of classes before Thanksgiving recess
Mon.	Dec.	1	Classes resume
Fri.	Dec.	5	Last day of Fall semester classes
Mon.	Dec.	8	Final examinations begin
Sat.	Dec.	13	Final examinations end

## SPRING SEMESTER 2004

Tues.	Jan.	20	Spring semester classes begin
Mon.	Feb.	2	Last day to to complete course registration without penalty fee(s) Last day to drop a course without "W" (Withdrawal) PeopleSoft course registration system closes
Fri.	March	5	Last day of classes before Spring recess
Mon.	March	15	Classes resume
Mon.	March	29	Last day for graduate students to drop a course without major advisor's written recommendation and Graduate School permission
Fri.	April	30	Last day of Spring semester classes
Mon.	May	3	Final examinations begin
Fri.	May	7	Last day to complete graduate degree requirements for May 2004 conferral
Sat.	May	8	Final examinations end
Sat.	May	8	Graduate Commencement Ceremony 2004

Faculty members should construct course syllabi with awareness of religious holidays.

<http://www.registrar.uconn.edu>

# BOARD OF TRUSTEES\*

Where appropriate, the end of a member's term is indicated by the year which follows his or her name.

The Honorable John G. Rowland, Governor of the State of Connecticut  
*president ex officio* ..... Hartford

The Honorable Theodore S. Sergi, Commissioner of Education  
*member ex officio* ..... West Hartford

The Honorable Shirley C. Ferris, Commissioner of Agriculture  
*member ex officio* ..... Newtown

## Appointed by the Governor\*

James F. Abromaitis, 2007 ..... Unionville

Louise M. Bailey, *secretary*, 2003 ..... West Hartford

William R. Berkley, 2005 ..... Greenwich

Michael H. Cicchetti, 2007 ..... Litchfield

Linda P. Gatling, 2003 ..... Southington

Roger A. Gelfenbien, *chair*, 2003 ..... Wethersfield

Lenworth M. Jacobs, 2007 ..... West Hartford

Claire R. Leonardi, 2005 ..... Harwinton

Michael J. Martinez, 2005 ..... East Lyme

Denis J. Nayden, 2007 ..... Wilton

David W. O'Leary, 2003 ..... Waterbury

Richard Treibick, 2005 ..... Greenwich

## Elected by the Alumni

Philip P. Barry, 2005 ..... Storrs

Frank A. Napolitano, 2003 ..... Manchester

## Elected by the Students

Christopher S. Hattayer, 2003 ..... Hartford

Richard T. Willey, 2004 ..... Hartford

## Deans of the Graduate School

George C. White, M.A. .... 1939-1940

Nathan L. Whetten, Ph.D. .... 1940-1970

Paris Roy Brammell, Ph.D. .... 1942-1945

Thomas F. Malone, Sc.D. .... 1970-1973

Hugh Clark, Ph.D. .... 1973-1974

Philip M. Rice, Ph.D. .... 1974-1977

Hugh Clark, Ph.D. .... 1977-1979

Anthony T. DiBenedetto, Ph.D. .... 1979-1981

Lewis Katz, Ph.D. .... 1981-1983

Fred G. Burke, Ph.D. .... 1983-1986

Karl L. Hakmiller, Ph.D. .... 1986-1986

Thomas G. Giolas, Ph.D. .... 1986-1997

Robert V. Smith, Ph.D. .... 1997-2000

Ian C. Hart, Ph.D. .... 2000-2002

Janet L. Greger, Ph.D. .... 2002-

# OFFICERS OF ADMINISTRATION & GROUPS #

Philip E. Austin, Ph.D., *President of the University*  
John D. Petersen, Ph.D., *Chancellor and Provost for University Affairs*

## OFFICE OF THE VICE PROVOST FOR RESEARCH AND GRADUATE EDUCATION

Janet L. Greger, Ph.D., *Vice Provost for Research and Graduate Education, and Dean of the Graduate School*

James G. Henkel, Ph.D., *Associate Vice Provost for Research and Graduate Education, and Associate Dean of the Graduate School*

Ilze Krisst, Ph.D., *Assistant Vice Provost for Research*

Carol Welt, Ph.D., *Assistant Vice Provost for Research, and Executive Director of the Office for Sponsored Programs*

Douglas W. Stone, D.V.M., M.S., *Director of the Office of Animal Research Services*

Alysia Maffucci, J.D., *Associate Director of the Office of Research Compliance*

Dorothy R. Williams, B.G.S., *Executive Assistant, Research and Graduate Education*

Carleen M. Morneau, B.S., *Administrative Services Assistant*

## THE GRADUATE SCHOOL

Janet L. Greger, Ph.D., *Vice Provost for Research and Graduate Education, and Dean of the Graduate School*

James G. Henkel, Ph.D., *Associate Vice Provost for Research and Graduate Education, and Associate Dean of the Graduate School*

Gerald D. Maxwell, Ph.D., *Associate Dean of the Graduate School (Health Center)*

Thomas B. Peters, Ph.D., *Program Director*

Anne Lanzit, B.S., *Associate Director of Graduate Admissions*

Rande-Jeanne Clark, *Administrative Services Specialist*

## THE RESEARCH FOUNDATION

Ilze Krisst, Ph.D., *Assistant Vice Provost for Research*

Douglas Bradway, M.A., *Coordinator of Research Services*

Ann Mathewson, B.A., *Administrative Services Specialist*

## GRADUATE FACULTY COUNCIL

The Graduate Faculty Council is the legislative body of the Graduate School. It establishes academic policy for graduate education, except for

those areas reserved to the Board of Trustees, to the University Senate, or to the faculties of other colleges and schools. The 60 members, representing specific content areas derived from constituent Fields of Study, are elected to serve three-year terms. The membership includes two voting student members chosen by the Graduate Student Senate. The President, the Provost, the Vice Provost and Dean of the Graduate School, and certain other administrative officers of the Graduate School are nonvoting ex officio members. The Council, representing the Graduate Faculty at large, exercises legislative authority in such areas as admissions criteria, curricular and degree requirements, new course approval, academic program review, and the like.

## The Executive Committee

The Executive Committee has both executive and advisory responsibilities to the Graduate Faculty Council and to the vice provost. Its membership is drawn from the Graduate Faculty Council and from the Graduate Faculty at large. The dean serves as chair. The Executive Committee is the steering committee for the Graduate Faculty Council. It advises the vice provost on matters of policy and regulatory interpretation, approves plans of study and dissertation prospectuses, and considers on the basis of academic merit proposals to modify or to create fields of study and areas of concentration. Members include:

Gregory J. Anderson, Ph.D., *Professor of Ecology and Evolutionary Biology*

Alexinia Y. Baldwin, Ph.D., *Professor of Education*

J. Garry Clifford, Ph.D., *Professor of Political Science*

David E. Cournoyer, Ph.D., *Associate Professor of Social Work*

David K. Herzberger, Ph.D., *Professor of Spanish*

Jean I. Marsden, Ph.D., *Professor of English*

Emilio Pagoulatos, Ph.D., *Professor of Agricultural and Resource Economics*

Erling A. Smith, Ph.D., *Professor of Civil Engineering*

Linda D. Strausbaugh, Ph.D., *Professor of Molecular and Cell Biology*

Janet L. Greger, Ph.D., *Vice Provost for Research and Graduate Education and Dean of the Graduate School (ex officio), Chair*

James G. Henkel, Ph.D., *Associate Vice Provost for Research and Graduate Education and Associate Dean of the Graduate School (ex officio)*

Gerald D. Maxwell, Ph.D., *Associate Dean of the Graduate School – Health Center (ex officio)*

## RESEARCH COUNCILS

Two research councils, appointed by the Chancellor, are advisory to the Vice Provost for Research and Graduate Education on matters relating to research development. The Storrs and

\* As of December 1, 2002

# As of July 1, 2003

Regional Campus Research Advisory Council and the Health Center Research Advisory Council also evaluate research proposals and recommend allotments from the University of Connecticut Office of Sponsored Program funds. The Foundation is an agency of the Graduate School and holds funds for a variety of research awards, services and facilities.

### Research Advisory Council Serving the Storrs and Regional Campuses: 2002-2003

Robert R. Birge, Ph.D., *Professor of Chemistry*  
 Richard D. Brown, Ph.D., *Professor of History*  
 Jean A. Givens, Ph.D., *Associate Professor of Art and Art History*  
 Davita S. Glasberg, Ph.D., *Professor of Sociology*  
 Lawrence E. Hightower, Ph.D., *Professor of Molecular and Cell Biology*  
 Andrea Hubbard, Ph.D., *Associate Professor of Toxicology*  
 Joseph J. LoTurco, Ph.D., *Associate Professor of Physiology and Neurbiology*  
 James O'Donnell, Ph.D., *Professor of Marine Sciences*  
 Richard Vengroff, Ph.D., *Professor of Political Science*  
 Thomas K. Wood, Ph.D., *Associate Professor of Chemical Engineering*  
 Janet L. Greger, Ph.D., *Vice Provost and Chair (ex officio)*  
 Ilze Krisst, Ph.D., *Assistant Vice Provost for Research (ex officio)*

### Health Center Research Advisory Council: 2002-2003

Elisa Barbarese, Ph.D., *Professor of Neuroscience*  
 Lance Bauer, Ph.D., *Professor of Psychiatry*  
 Elizabeth Eipper, Ph.D., *Professor of Neuroscience*  
 Richard Fortinsky, Ph.D., *Associate Professor of Medicine and Community Health*  
 Marc Hansen, Ph.D., *Professor of Medicine*  
 John Harrison, Ph.D., *Assistant Professor of Orthodontics (ex officio)*  
 Sandra Hewett, Ph.D., *Associate Professor of Neuroscience*  
 Timothy Hla, Ph.D., *Professor of Physiology*  
 Marc LaLande, Ph.D., *Professor of Genetics and Developmental Biology*  
 Leonard Paplauskas, B.S., *Assistant Vice President for Research (ex officio)*  
 Susan Reisine, Ph.D., *Professor of Behavioral Science and Community Health*  
 William Upholt, Ph.D., *Professor of BioStructure and Function*  
 Leslie Wolfson, M.D., *Professor of Neurology, Chair*

## CENTERS & INSTITUTES

The University has established centers and institutes for the purpose of encouraging and facilitating multidisciplinary and interdepartmental research and graduate training. Listed below are examples of the variety of centers and institutes available for research, graduate education, and public service.

Advanced Technology Institute  
 Agronomy Research Farm  
 Asian-American Studies Institute  
 Biotechnology Center  
 Taylor L. Booth Center for Computer Applications and Research  
 Center for Biochemical Toxicology  
 Center for Conservation and Biodiversity  
 Center for Contemporary African Studies  
 Center for Drug Discovery  
 Center for Ecological Study of Perception and Action  
 Center for Environmental Health  
 Center for European Studies  
 Center for Geographic Information and Analysis  
 Center for Health Fitness  
 Center for HIV Intervention and Prevention  
 Center for Instructional Media and Technology  
 Center for Judaic Studies and Contemporary Jewish Life  
 Center for Latin American and Caribbean Studies  
 Center for Learning in Retirement  
 Center for Marital and Family Therapy  
 Center for Oral History  
 Center for Parental Acceptance and Rejection  
 Center for Population Research  
 Center for Real Estate and Urban Economic Studies  
 Center for Regenerative Biology  
 Center for Survey Research and Analysis  
 Center for Wildlife Research  
 Connecticut Center for Economic Analysis  
 Connecticut Global Fuel Cell Center  
 Connecticut Small Business and Development Center

Connecticut Space Grant College Consortium  
 Connecticut Transportation Institute  
 Connecticut Writing Project  
 Consortium for Public Policy Research  
 Thomas J. Dodd Research Center  
 Educational Research Bureau  
 Electrical Insulation Research Center  
 Electron Microscopy Laboratory  
 Environmental Research Institute  
 Family Business Program  
 Food Marketing Policy Center  
 Institute for African-American Studies  
 Institute for Social Inquiry/The Roper Center  
 Institute of Materials Science  
 Institute of Public Service  
 Institute of Public Affairs  
 Institute for Puerto Rican and Latino Studies  
 Institute for Teaching and Learning  
 Institute of Water Resources  
 Institute of Writing  
 Labor Education Center  
 Marine Sciences and Technology Center  
 National Research Center on the Gifted and Talented  
 National Undersea Research Center  
 Northeastern Research Center for Wildlife Diseases  
 A.J. Papanikou Center on Special Education and Rehabilitation (UAP)  
 Polymer Science Program  
 Sea Grant College Program  
 Small Business Institute  
 University of Connecticut Center on Aging and Human Development  
 Wolf Entrepreneurship Program  
 Women's Center  
 Writing Resource Center



# GENERAL INFORMATION

All graduate degrees at the University of Connecticut except the M.D., D.M.D., Pharm.D., and J.D. are awarded through the Graduate School.



## GRADUATE EDUCATION AND RESEARCH: HISTORY

The Graduate School is responsible for graduate education and research. It establishes, administers, promotes, and reviews all post-baccalaureate educational programs and the curricular components contained therein with the exceptions of Law, Medicine, Dental Medicine, Pharmacy, and the Sixth-Year Professional Diploma Program in Education. It serves as the primary advocate for the University's research mission by creating opportunities for outstanding research and fostering the scholarly basis for new and continuing research.

The Graduate Faculty Council functions as the legislative body of the Graduate School. It establishes academic policy for graduate education, except for these areas reserved to the Board of Trustees, to the University Senate, or to the faculties of other colleges and schools.

The Graduate School offers work in 80 fields of study – master's degree study is offered in 70 fields and doctoral study is offered in 65 fields. Study is offered in these broad areas: agricultural, biological, biomedical, communication, marine, materials, mathematical, pharmaceutical, and physical sciences; allied health; business administration; education; engineering; family studies; fine arts; nursing; humanities; and social sciences. Students admitted to the Graduate School exhibit superior ability, a high level of motivation, and dedication to the pursuit of knowledge.

Graduate study had been introduced in a modest way by 1920. By the time the University was chartered in 1939, fifty-five master's degrees had been awarded – most of them in the physical and biological sciences. During World War II, serious consideration was given to the establishment of a full-fledged graduate program. The Board of Trustees authorized the initiation of doctoral study and charged the Graduate School with responsibility for making Storrs a center for graduate training and research. Subsequent increases in demand for advanced work followed the national trend of the fifties and sixties. The first Ph.D. degrees were conferred in 1949. There are now more than 2,000 students working toward this degree. More than 3,500 students are enrolled in master's degree programs.

The University Research Foundation was created by statute in 1945. Although at first an independent entity, it became a part of the Graduate School in 1962. At the same time, the Office of Research Development was established. Problems affecting research and related graduate training are continuously analyzed by the two Research Advisory Councils, groups of faculty members advisory to the Director of the Research Foundation. Through these agencies the Graduate School encourages and financially supports research, travel of faculty members and graduate students, colloquia, fellowship and traineeship programs, the development of the University library and other facilities, and efforts to improve and expand interdisciplinary relations. The Research Foundation facilitates the preparation of proposals for research and training grants as well as dissemination of information about the availability of new sources of funds.

During the 1965 session, the Connecticut General Assembly enacted legislation giving the University sole responsibility for the development and control of all doctoral programs financially supported by the State. The General Assembly appropriated funds for the construction of the first phase of the Nathan Laselle Whetten Graduate Center, to which the federal government also contributed. The Center includes faculty studies for research in the humanities and social sciences, administrative headquarters for the Graduate School and the Research Foundation, and graduate residence halls.

A most significant action taken by the General Assembly of 1965 was the establishment of state-supported University Predoctoral Fellowships which provide the Graduate School flexibility in furnishing to the most capable students the aid necessary to complete a doctoral degree in a short span of time compatible with their objectives and needs. There are more than 550 University Predoctoral Fellows.

Today, support for graduate students conducting research is provided in large measure through a variety of external sources – including foundations, business, industry, and government. The University enjoys a happy and productive research relationship with many of the corporations and industries in Connecticut.

The Graduate School observed its 50th anniversary in 1990-91. A lecture series featuring prominent alumni representing several fields culminated in a celebration at the Old State House in Hartford.



## SPECIAL FACILITIES

The University of Connecticut Libraries form the largest public research collection in the state. The collection contains over 2.5 million volumes, 10,000 currently received periodicals, 22,000 full-text electronic journals, 2.8 million units of microform, 35,000 reference sources, 180,000 maps and an

array of electronic information sources, many of which contain the full text of research journals, monographs, and historic documents.

The University's main library, the Homer Babbidge Library, is located at the center of the Storrs academic core, and serves both graduate and undergraduate programs. The Electronic Information Learning Center, featured on Level 1, offers two large information retrieval cafes, a 40 workstation microlab, an electronic classroom, an instructional resource center, digitizing and scanning services, a branch of the UConn writing center, as well as reference and research services. The Map & Geographic Information Center on Level 4, the largest public map collection in New England, is a nationally acclaimed resource for geospatial data. The Babbidge Library houses extensive video and audio collections, maintains two very popular video theatres, an Art & Design reading room, and comprehensive collections of current and retrospective Federal and Connecticut documents.

Other libraries on the Storrs campus include the Music & Dramatic Arts Library in the Fine Arts complex, the Pharmacy Library at the School of Pharmacy, and the Archives & Special Collections at the Dodd Research Center. The Libraries' networked resources, including many electronic databases, thousands of e-journals, e-books, and numerous full text reference tools, are available to all members of the University community via the Internet.

Information about library resources, hours, and policies, including links to the regional campus and the UConn School of Law and Health Center libraries, is available online at <<http://www.lib.uconn.edu>>.

University Information Technology Services provides opportunities for all departments to use large, high-speed digital and analog computers. The University cooperates with the New England Regional Computing Program, an organization of about seventy New England colleges and universities, to develop computing activities and share facilities.

The Technical Services Center produces and maintains a wide variety of scientific equipment used in research by faculty members and graduate students.

The University has a wide range of facilities, including centers and institutes, as well as research and experimental laboratories. The Storrs Agricultural Experiment Station also conducts programs jointly with many University departments.

Additionally, the University has close working relationships with the Frank C. Munson Institute of American Maritime History (Mystic Seaport), the U.S. Navy Submarine Medical Research Laboratory, the Haskins Laboratories (New Haven), the Connecticut Agricultural Experiment Station (New Haven), and a number of hospitals throughout the area – all of which permit the conduct of special research and graduate programs.

## ADMISSION

To study for a graduate degree, a student must be admitted by the Dean of the Graduate School. No course work taken before the date of admission to the Graduate School may be included on a plan of study for a graduate degree unless specific approval has been granted by the Dean of the Graduate School.

Unless students complete appropriate course work for credit in the semester or summer for which they have been admitted, or a written request for a limited postponement has been submitted to and approved by the Graduate School before the end of that semester or summer, the admission becomes invalid. If this occurs, the student must apply for readmission with no certainty of being accepted.

Students may earn a graduate degree only in a program to which they have been admitted. Ordinarily, a student is granted admission to pursue graduate study in one field at a time. On occasion, however, a student may be permitted with approval to enroll concurrently in two different programs.

There are several approved dual degree programs providing the opportunity for the student to pursue work toward two degrees simultaneously. These programs often involve the sharing of a limited and specified number of course credits between the two degrees. The list of dual degree programs offered by the Graduate School and the other participating schools and colleges within the University (e.g., the Schools of Law, Medicine, and Dental Medicine) can be found in the index under "Dual Degree Programs." In some cases, separate applications must be filed for each of the two degree programs.

To be admitted to Regular status and to begin studies, an applicant must hold a baccalaureate from an accredited college or university or present evidence of the equivalent. The applicant must submit to the Graduate School official transcripts covering all previous work, undergraduate and graduate, which must be of at least the following quality: a cumulative grade point average of 3.0 for the entire undergraduate record, or 3.0 for the last two years, or excellent work in the entire final year. The grade point average is computed on the basis of the following scale: A = 4.0, B = 3.0, C = 2.0, D = 1.0, F = 0. Applicants from foreign colleges and universities must meet equivalent standards of eligibility and are expected to submit official transcripts showing all work completed. All advanced post-baccalaureate course work is considered, as well.

Applicants to most programs are encouraged to submit test scores from the General Test of the Graduate Record Examinations to the department or program to which they are applying.

Many departments or programs require or recommend that test scores be submitted for the Graduate Record Examinations and/or the Miller Analogies Test. Information about making arrangements to take these tests at this University

or at other centers may be obtained from the Bureau of Educational Research, School of Education. Letters of recommendation, usually three, preferably from members of the academic profession, are required by all departments. These letters and a personal letter from the student must be sent to the departmental or program admissions committee. Departmental directory information is included with the application form.

Meeting the minimum requirements does not guarantee admission. Applicants must show promise of superior achievement and must have specific preparation for the course of study they wish to undertake. If their records indicate deficiencies, they may be refused admission or required either to take background courses without graduate credit or to demonstrate by examination that they have acquired the requisite knowledge or skills for graduate study. In addition, since each graduate program has a limited number of places, the successful applicant must have a record competitive with those of other applicants in the same field.

**Regular and Provisional Status.** Application procedures and required credentials for admission to Regular status are specified above. Occasionally students who hold the baccalaureate but do not qualify fully for admission to Regular status may give evidence of ability in their chosen field sufficiently convincing to warrant their provisional admission to a master's degree program only. (Applicants are not admitted provisionally to a doctoral program.) If a Provisional student's initial twelve credits of completed course work (excluding 100's-level courses) meets the minimum scholastic requirement of the Graduate School, he or she is accorded Regular status. Otherwise, he or she is subject to dismissal. In situations where special consideration is warranted, and only upon the specific request of the major advisor, the dean may approve changing a student to Regular status if at least nine credits of advanced course work have been completed with superior grades. Regular, not Provisional, status is required for degree conferral.

**Language-Conditional Status.** International graduate applicants whose English language proficiency does not meet the minimum standard to qualify for Regular admission (a computer-based score of 213 or greater, or a written test score of at least 550, on the Test of English as a Foreign Language, or a score of at least 85 on the Michigan Placement Test) may be admitted at the master's level as Language-Conditional Students. Those admitted on F-1 visas must be fully academically admissible as a Regular student (see above). Those admitted on J-1 student visas may be academically admissible as a Provisional student (see above).

**Integrated B.S./M.S. Degree Program in Physical Therapy.** The Department of Physical Therapy offers an Integrated Bachelor's/Master's Program leading ultimately to the Master of Science in Physical Therapy degree. While initial application is made to the Undergraduate Admissions Office, successful completion of the baccalaureate portion of the program is an absolute

prerequisite for admission to the Graduate School for completion of the master's degree.

**The Sixth-Year Diploma in Professional Education.** This post-master's diploma program is offered by the School of Education. It is not administered by the Graduate School. Inquiries regarding the Sixth-Year Diploma in Professional Education should be addressed to the Office of the Dean, School of Education, 249 Glenbrook Road, Unit 2064-C, Room 227, Storrs, Connecticut 06269-2064.

**Admission to the D.M.A. Program.** Applicants are expected to demonstrate outstanding musical ability and to have a superior record of previous performance and scholarship. A completed master's degree is required for admission. Holding a master's degree from this or from any other institution, however, does not render the applicant automatically admissible to the D.M.A. program. Areas of Concentration offered are Conducting and Performance (specifically cello, piano, trumpet, violin, viola, and voice). A personal audition is required as part of the application process. Inquiries should be addressed to: Director of Graduate Studies, Department of Music, 876 Coventry Road, Unit 1012, Storrs, Connecticut 06269-1012.

**Admission to Ph.D. Programs.** Applicants to Ph.D. programs are expected to demonstrate outstanding ability and to show on the record of previous scholarship and experience that they are likely to do superior creative work in their respective fields. Holding a master's degree from this or any other institution does not render the applicant automatically admissible to a doctoral program. Certain master's programs, on the other hand, are open only to applicants likely to qualify for doctoral study. In general, doctoral applicants must meet all admission requirements for the master's degree as Regular graduate students and must present evidence that they are capable of doing independent work of distinction.

**Special Student Status.** Individuals who otherwise would qualify for admission with Regular status but who do not seek a degree from this University may be permitted to take courses for an unspecified time if their work here meets Graduate School standards. Special students may be working toward an advanced degree at another institution, in which case they are presumed to be fully qualified to pursue degree work at this University. Others may wish to take courses as Special students for personal enrichment.

**Graduate Certificate Programs.** An earned baccalaureate degree (or its equivalent) is required for admission. Each certificate program sets specific admissions criteria, including minimum grade point average and standardized test scores (including the Test of English as a Foreign Language, if required). Students currently enrolled in a graduate degree program must inform the certificate program coordinator of their intent to earn the graduate certificate (no other application is required). Students who are not currently enrolled in a graduate degree program must apply for admission to a graduate certificate



program before one-half of the required course work is completed. Detailed information concerning admissions criteria and procedures can be obtained from the coordinator of the specific graduate certificate program or from the Graduate Admissions Office.

**Other Non-Degree Categories.** Individuals with appropriate preparation who have not been admitted to any of the admissions categories described above may take courses as non-degree students. All non-degree students are presumed to be taking courses for reasons other than earning a certificate, sixth-year diploma in professional education, or a graduate degree at this institution. Should they later be admitted to a graduate degree program at this University, usually not more than six credits will be acceptable toward the master's degree. In any event, such credits accepted toward a graduate degree must be of B (not B-) quality or higher. For further information, contact the College of Continuing Studies, One Bishop Circle, Unit 4056, Storrs, Connecticut 06269-4056.

**Admission of University Faculty and Staff.** University of Connecticut faculty members who hold tenure or a rank higher than instructor leading to tenure ordinarily may not earn a graduate degree at this institution. Exceptions to this policy may be made by the Dean of the Graduate School, with the advice of the Executive Committee of the Graduate Faculty Council, who must be satisfied that the intended program is in the best interest of the University.

**New England Regional Student Program.** The University of Connecticut participates in a regional program administered by the New England Board of Higher Education. This program, known as the New England Regional Student Program, permits qualified residents of the New England states to study with in-state tuition privileges or by paying an amount fifty percent above in-state tuition (depending on the institution in which the student enrolls), in certain programs at any of the state universities and the public four-year colleges.\*

The purpose of the program is to expand opportunities in higher education for New England residents by making available on a substantially equal basis to all students those programs not commonly offered at every institution. This practice tends to reduce duplication of courses and thus to utilize most efficiently the higher educational facilities in each state.

Detailed information about this program can be obtained from the Graduate School, 438 Whitney Road Extension, Unit 1006, Storrs, Connecticut 06269-1006, or from the New England Board of Higher Education, 45 Temple Place, Boston, Massachusetts 02111.

**Application Processing Fee.\*** A non-refundable fee of \$55 for electronic submission or \$75 for paper submission must accompany the application. It may not be applied toward other charges. This fee must accompany every application submitted except for a doctoral degree program to follow immediately a master's degree program in

the same field at this University, or for re-application requested by the Dean.

**Application Deadlines.** Students are advised to file the application for admission several months in advance of the first semester of course work. Because many programs are filled far in advance of application deadlines, prospective students are encouraged to submit their applications for admission as early as possible. Applicants should check with appropriate academic departments concerning deadlines. All credentials, including official transcripts covering all undergraduate and graduate work taken up to the time of application, as well as the non-refundable processing fee, must also have been received by deadline dates.

**International Applicants.** Students who are not United States citizens or permanent resident aliens must meet additional requirements before their admission is finalized. They must present documentary evidence of their ability to meet all expenses for at least the first year of study and an acceptable plan for financing the remainder of their program. Students whose native language is not English must show evidence of proficiency in the English language by having earned either a computer-based score of at least 213 or a written score of at least 550 on the TOEFL (Test of English as a Foreign Language), administered by the Educational Testing Service, Princeton, New Jersey 08541-6151. Some departments require the Test of Spoken English (TSE) or the Test of Written English (TWE). All graduate students who will be serving as teaching assistants will be required to present evidence of competence in spoken English. This may take the form of a score of 50 or higher on the Test of Spoken English if the student's native language is not English and if the student does not hold a degree from an anglophone college or university. Further information is available from the Graduate Admissions Office.

**Application Forms and Instructions.** With the exception of the programs listed below, application materials may be obtained by writing to the Graduate School, 438 Whitney Road Extension, Unit 1006, Storrs, Connecticut 06269-1006. This information also can be downloaded from the Graduate School's Web site at <<http://www.grad.uconn.edu>>. Applications and transcripts must be submitted to that office, while letters of recommendation, personal letters supporting the application, applications for financial support, and all routine communications should be addressed to the admissions committee chair of the specific program in which the applicant seeks to study.

Inquiries regarding the Master of Business Administration should be addressed to the director of that program, School of Business, 2100 Hillside Road, Suite 238, Unit 1041-MBA, Storrs, Connecticut 06269-1041. Inquiries regarding graduate degree programs located at the University of Connecticut Health Center should be addressed to: University of Connecticut Health Center, Graduate Student Affairs Office, Room MC 3906, Farmington, Connecticut 06030. Inquiries regarding the Master of Social Work, should be directed to

the School of Social Work, University of Connecticut, 1798 Asylum Avenue, West Hartford, Connecticut 06117-2698. Inquiries regarding study in Law should be directed to the School of Law, 55 Elizabeth Street, Hartford, Connecticut 06105-2296.

**Supplementary and Departmental Transcripts.** If a student is admitted before completing a baccalaureate or graduate degree or additional non-degree course work which is in progress at the time of application, admission is conditional on the completion of the degree or course work and the submission to the Graduate School by the end of the first semester of study of a satisfactory supplemental official transcript. A duplicate set of official transcripts of all work taken prior to the commencement of work in the Graduate School should be sent to the student's major advisor. Until all transcripts have been received, the plan of study will not be approved. All transcripts submitted, including test scores, become the property of the Graduate School and are not returnable.

\* Fees are subject to change without notice.

## ADVISORY SYSTEM

Degree programs are planned by the advisory committee after consultation with the student. There is considerable flexibility in meeting special needs insofar as these are consistent with the regulations of the Graduate School. A degree program may entail course work in more than one field of study, but each program must include a coherent emphasis within one existing field of study and area of concentration, if applicable.

A major advisor must be appointed at the appropriate level by the Dean of the Graduate School, by authorization of the President of the University, to advise in a particular field of study or area of concentration. In applying for admission, an applicant may indicate a preference for a particular major advisor. If at the time of admission an applicant expresses no preference, or if the preferred advisor is unable to accept, another may be appointed. Since consistency of direction is important, a durable relationship between the student and advisor should be formed as early as possible. Occasionally, it may be desirable or appropriate for a student's degree program to be directed by co-major advisors (not more than two). Each co-major advisor must hold an appropriate appointment to the graduate faculty in the student's field of study and area of concentration (if applicable).

If a change of major advisor becomes necessary for any reason, the student must file a special form, bearing the signatures of the former advisor and the new advisor, with the Graduate School. The signature of the former major advisor is requested for informational purposes only. It does not, in any way, signify permission or consent on the part of the former major advisor.

If a major advisor decides that it is not possible to continue as a student's major advisor and wishes to resign, the Graduate School must be notified in writing as soon as possible. The student is then provided with a reasonable opportunity to arrange for a new major advisor. If a new major advisor is not identified within six weeks of the resignation of the former major advisor, the student's graduate degree program status is terminated. A student whose status has been terminated may request a hearing before the Associate Dean by filing a written request within 30 days of receipt of the letter of termination.

The advisory committee of a master's degree program student is formed after consultation between the major advisor and the student and must include at least two associate advisors, at least one of whom must hold a current appointment to the graduate faculty of the University of Connecticut. An associate advisor must possess suitable academic or scientific credentials in the field of study of the degree. The advisory committee should be formed before the student has completed twelve credits of degree program course work and shall then supervise the remainder of the student's degree program.

The advisory committee of a doctoral degree program student is formed after consultation between the student and the major advisor and shall include at least two associate advisors with suitable academic or scientific credentials. The major advisor and at least one associate advisor shall be members of the graduate faculty appointed to advise doctoral students in the student's field of study and area of concentration, if applicable. In addition to the three or more members chosen in the usual way, another member, ordinarily a member of the graduate faculty outside the student's field of study but in a related field, may be appointed by the Dean of the Graduate School. If the committee consists of three members, committee decisions must be unanimous. If the committee consists of four or more members, committee decisions are considered adopted if there be no more than one negative vote, although the major advisor must always vote in the affirmative. Committee decisions involving the outcome of the General Examination, approval of the dissertation proposal, oral defense of the dissertation, or approval of the dissertation itself, however, must be unanimous in any event.

A member of the University of Connecticut Graduate Faculty who has retired from active service may be considered for appointment as Major Advisor for a newly-admitted master's or doctoral student. Application is made to the Executive Committee of the Graduate Faculty Council and requires submission of a curriculum vita and letters of support as well as the endorsement of the appropriate department or program head. The retired faculty member must present substantial evidence of ongoing research and scholarly activity in the field. Separate application is required for each newly-admitted student for whom a retired faculty member wishes to serve as Major Advisor. Such appointments are made by the Dean with the advice of the Executive Committee.

A current graduate student may *not* serve as a member of another graduate student's advisory committee.

If deemed appropriate by a graduate student's major advisor, the major advisor may request that a suitably qualified external associate advisor be appointed to the student's advisory committee by writing to the Graduate School. The request should be accompanied by a curriculum vita for the individual being recommended for appointment. Such appointments are made on the basis of advanced training and significant experience in the field of study. An appointment as external associate advisor is limited to an individual student's advisory committee and does not imply in any way membership on the Graduate Faculty of the University. Ordinarily, not more than one external associate advisor is appointed to any master's or doctoral student's advisory committee. The major advisor and at least one associate advisor on any doctoral student's advisory committee must be members of the University of Connecticut Graduate Faculty.

The major advisor is responsible for coordinating the supervisory work of the advisory committee. Therefore, when the major advisor is

to be on leave or is not in residence, it is the major advisor's responsibility to appoint an acting major advisor. The acting major advisor must be a member of the Graduate Faculty or be fully eligible for such an appointment. The acting major advisor will assume all duties and responsibilities of the major advisor for the duration of the appointment. The major advisor will inform the Graduate School of the appointment and provide any information that may be required concerning the credentials of the acting major advisor.

Students' advisory committees are responsible directly to the Dean of the Graduate School. For advisory committees of doctoral students, it is required that the written consent be obtained from the Graduate School before any changes are made in the membership of an advisory committee which has been duly established.

# FEES AND EXPENSES

The schedule of fees contained in this section is comprehensive and is expected to prevail during the 2003-2004 academic year, but the Board of Trustees and the Board of Governors for Higher Education reserve the right, at any time, to authorize changes in fees and to establish new fees applicable to all currently enrolled students.

All fees are collected by the Office of the University Bursar in the Wilbur Cross Building. Fees pertaining to off-campus programs in social work and business administration are payable at those locations. (See applicable brochures for fees, billings, and payment procedures.)

Fee bills are mailed by the Office of the University Bursar soon after registration (July-August for the fall semester and December-January for the spring semester). These bills, covering the semester's charges payable in advance, must be paid by the tenth day of the semester (see "Graduate School Calendar"). Failure to make payment on time will result in cancellation of registration and any residence hall assignment. A graduate student may apply for a limited deferment of the payment date for a semester fee bill at the Deferment Office in the Wilbur Cross Building. Partial payment of fees is not accepted by the Bursar. A receipt for payment or evidence of an approved deferment must be presented to complete registration.

## Financial Responsibility

Failure to receive a bill does not relieve a student of responsibility for payment of fees by the specified due date. A student who fails to make timely payment of an outstanding balance may be barred from all privileges normally accorded to a student in good standing. These include but are not limited to: advance registration (which if already completed will be subject to cancellation), registration, class attendance, advisement, dormitory room (for which any assignment will be cancelled), dining hall, library, infirmary, certification-of-status, and academic transcript privileges. Additionally, any pending University of Connecticut employment authorization may not receive approval or may be subject to cancellation. If there is a question concerning a bill, it is the student's responsibility to contact directly the Office of the University Bursar for clarification and resolution.

If a graduate student does not meet his or her financial obligations to the University by the tenth day of a given semester or by the expiration date of an approved deferment, cancellation of the student's registration and student privileges will result.

## Application Processing Fee

A non-refundable fee of \$55 for electronic submission or \$75 for paper submission must accompany an application to the Graduate School. It may not be applied toward other charges. This fee must accompany every application submitted except for a doctoral degree program to follow immediately on a completed master's degree program in the same field at this University, or for re-application requested by the Dean.

## In-State and Out-of-State Status

Each student must file an affidavit of residence with the application for admission to the Graduate School. A form for this purpose is provided as part of the application packet. On the basis of this information, each entering student is classified as either a Connecticut student or an out-of-state student. Failure to file the form will result in classification as out-of-state.

Questions concerning the classification of graduate students as resident (in-state) or non-resident (out-of-state) are resolved by the Graduate School. In the event that a student believes that he or she has been incorrectly classified, a request for a review, along with supporting documentary evidence, should be directed to the Graduate School.

Residents of other New England states enrolled in certain graduate degree programs may be eligible for special tuition rates through the New England Board of Higher Education Regional Student Program. (See "New England Regional Student Program.")

## Tuition

All graduate students – except in Summer Sessions programs (College of Continuing Studies) and those business administration programs conducted at centers away from Storrs – are subject to a tuition charge in addition to the other fees charged Connecticut, New England Regional Student Program, and out-of-state students.

Students who are classified as Connecticut residents pay tuition of \$3,239 per semester if registering for nine or more credits. Students eligible for the New England Regional Student Program pay tuition of \$4,859 per semester at the nine or more credit level. Students who are classified as out-of-State students pay tuition of \$8,415 per semester for nine or more credits.

Tuition is pro-rated for students registering for fewer than nine credits per semester, according to the accompanying schedule.

**Tuition (but not the associated fees) is waived for graduate assistants.** If an assistantship begins or terminates during the course of a semester, tuition will be prorated on a weekly schedule – charged for that portion of the semester when the assistantship is not in force, and waived when it is in force. This can result in either a partial tuition assessment (if the student is registered

throughout the semester for tuition-bearing course work) or a partial refund (if tuition has been paid).

Additionally, tuition (but not the associated fees) is waived for certain groups of individuals. One of these groups includes any dependent child of a person whom the U.S. armed forces has declared either to be missing in action or to have been a prisoner of war while serving in the armed forces after January 1, 1960, provided that person was a resident of Connecticut at the time of entering the service of the armed forces of the United States or was a resident of Connecticut while so serving.

A second group includes any veteran having served in time of war, as defined in subsection (a) of section 27-103, or who served in either a combat or combat support role in the invasion of Grenada (from October 25, 1983 to December 15, 1983), the invasion of Panama (from December 20, 1989 to January 31, 1990), the peace-keeping mission in Lebanon (from September 29, 1982 to March 30, 1984), or Operation Earnest Will (escort of Kuwaiti oil tankers) (from February 1, 1987 to July 23, 1987), and is a *resident of Connecticut at the time of acceptance for admission or readmission to the University*. Eligible individuals should contact the Office of Student Financial Aid Services in the Wilbur Cross Building, Room 25, phone (860) 486-2819, for an application for the tuition waiver. Additional information on the *Veterans Administration Educational Assistance and Training Waiver* is located in the Financial Aid section of this Catalog.

The third group of individuals includes any person sixty-two years of age or older who has been admitted into a degree-granting program or who wishes to take courses on a space available basis as a non-degree student. If any person who receives a tuition waiver in accordance with the provisions of this subsection also receives educational reimbursement from an employer, the waiver is reduced by the amount of the educational reimbursement.

## General University Fee

The General University Fee is assessed each semester on the basis of the student's course load status (part-time, half-time, or full-time) as determined by Graduate School policies. Students who are part-time are charged \$135, while students who are half-time are charged \$270, and full-time students are charged \$405 per semester. Students paying this fee at any level have access to the Student Health Service.

## Audit Fees

Students auditing courses pay the same tuition and fees as those students who have enrolled for course credit. Tuition is charged on the basis of course credit hours, while the charge for the other fees (e.g., the General University Fee), is dependent on the student's total course load (part-time, half-time or full-time), as determined by Graduate School policies. (See "General University Fee.")



**Graduate Matriculation Fee**

Each degree-seeking student under the jurisdiction of the Graduate School pays a Graduate Matriculation Fee of \$42 per semester. This fee is payable regardless of the credit load or the campus of registration, and applies to students registering for Continuing Registration or other zero-credit courses as well. Graduate students who enter graduate school with more than six credits of advanced course work and apply it to their degree requirements are responsible for payment of the Graduate Matriculation Fee for those semester(s) in which the excess non-degree work was taken, unless the fee is waived by the Dean of the Graduate School.

**Graduate Activities Fee**

A non-refundable fee of \$13 per semester is charged all students taking courses at the Storrs campus. The proceeds from this fee are used by the Graduate Student Senate for its programs for graduate student welfare and recreation.

**Infrastructure Maintenance Fee**

All full-time registered students are subject to an Infrastructure Maintenance Fee of \$141 each

semester, used to defray the operating and maintenance costs related to new capital projects funded by the UConn 2000 initiative. This fee is prorated for half-time and part-time students, as presented in the accompanying chart.

**Student Transit Fee**

Graduate students on the Storrs campus are charged a Transit Fee of \$20 per semester. This fee supports the campus shuttle bus service.

**International Sponsored Student Fee**

A fee of \$300 per semester is charged all international students who apply through, and are funded by, governmental, quasi-governmental, private, or public organizations.

**Non-Credit Continuing Registration**

Students not registering with the University for credit-bearing course work or other curricular offering in a given semester are required to maintain a continuing registration in the Graduate School by registering for one of the Graduate School's zero-credit Continuing Registration courses. These courses include GRAD 398 for non-thesis master's degree students, GRAD 399 for thesis master's degree students, GRAD 498 for doctoral

students not yet engaged in dissertation research or writing, and GRAD 499 for doctoral students currently engaged in dissertation research or writing (see "Continuous Registration" under Registration). Students who register for the zero-credit Continuing Registration courses are considered to be part-time students. They pay the Graduate Matriculation Fee as well as the General University Fee and other fees at the part-time level, but they are ineligible for need-based or merit-based financial aid.

If a graduate student does not complete payment for his or her Continuing Registration course to the Office of the University Bursar by the first day of the semester, the registration is cancelled and a reinstatement fee of \$65 may be assessed when the student is reactivated.

**Deposit Account**

A deposit of \$50 must be maintained by every registered student. This deposit, less deductions for breakage, fines, medicines charged at the pharmacy of the Infirmary, and any other outstanding charges, will be refunded after the student leaves the University, either through graduation or other action.

**Semester Tuition and Fee Schedule for Graduate Students**

Course Credits	Tuition			Fees				Totals		
	In-State	New England Regional	Out-of-State	General University Fee	Infrastructure Maintenance Fee	Graduate Matriculation Fee	Graduate Activity Fee	In-State	New England Regional	Out-of-State
<b>Part-time</b>										
0*	\$ 0	\$ 0	\$ 0	\$ 135	\$ 36	\$ 42	\$ 0	\$ 213	\$ 213	\$ 213
1	360	540	935	135	36	42	13	586	766	1,161
2	720	1,080	1,870	135	36	42	13	946	1,306	2,096
3	1,080	1,620	2,805	135	36	42	13	1,306	1,846	3,031
4	1,440	2,160	3,740	135	36	42	13	1,666	2,386	3,966
<b>Half-time</b>										
5	1,799	2,699	4,675	270	71	42	13	2,195	3,095	5,071
6	2,159	3,239	5,610	270	71	42	13	2,555	3,635	6,006
7	2,519	3,779	6,545	270	71	42	13	2,915	4,175	6,941
8	2,879	4,319	7,480	270	71	42	13	3,275	4,715	7,876
<b>Full-time</b>										
9 or more	3,239	4,859	8,415	405	141	42	13	3,840	5,460	9,016

\*Graduate non-credit Continuing Registration *only*

**Important Notes:**

1. Tuition (but *not* fees) for Graduate Assistants is waived, if the appointment is at the level of 50%-time (i.e., 10 hours per week) or greater.
2. All Graduate Assistants must pay the associated fees at the full-time rate and must register for a minimum of six credits of course work.
3. Students registered *only* for non-credit Continuing Registration (i.e., GRAD 398, 399, 498, or 499) or certain other zero-credit courses pay the General University Fee at the part-time rate of \$135/semester.
4. Other applicable fees and required deposits are added to student fee bills as appropriate.

**Fees are subject to change at any time without notice.**

2003-2004



### Cooperative Bookstore Account

A one-time, refundable Cooperative Bookstore payment of \$25 is required of all students, with the exception of Health Center students at Farmington, M.B.A. students at Hartford or Stamford, students registered solely for Summer Sessions, non-degree students, and students engaged exclusively in non-credit extension work. When students terminate their association with the University, the \$25 Cooperative Bookstore Account will be refunded.

### Residence Hall Fee and Room Deposit

In 2003-2004, the fee charged all students living in a graduate residence hall is \$2,087 per semester or approximately \$6,100 per calendar year. Any student who has contracted for a room for the coming semester and then cancels the reservation prior to August 1 for the fall semester or January 2 for the spring semester will be held responsible for payment of a \$60 room cancellation charge.

A room deposit of \$140 is required to reserve a room in a graduate residence hall for the fall semester. A refund of \$80 may be paid if the student cancels the reservation by the above deadlines. The room deposit will be applied toward the room fee or the room cancellation charge only. Failure to remit this payment will result in cancellation of the room assignment.

Newly entering students applying for a room must pay the \$140 room deposit within fifteen days of the date stamped at the top of the room application form enclosed with the notification of admission.

### Board Fee

Graduate students living in a graduate residence hall may purchase meals on a cash basis at Jonathan's (a campus restaurant located in the Student Union) or at the guest rate in a University dining hall, or may choose to subscribe to the board plan in a University dining hall. This plan provides three meals a day, seven days per week, while classes are in session, at a cost of \$1,609 per semester.

Failure to pay the board fee as billed does not relieve the student of the financial obligation. If a student gives notice of cancellation to the Department of Residential Life, the student will be held responsible for payment of the board fee as indicated under "Refunds and Cancellations of Charges."

### Late Registration/Payment Fee

An accumulating penalty fee is charged students registering for credit courses through the University Registrar at the Storrs campus, the regional campus at Avery Point, and at the Health Center in Farmington who fail to complete initial course registration and to pay all due fees on or before the tenth day of classes of any semester (additions to and deletions from a student's initial registration and payment of the resulting adjusted fee bill can occur freely through the end of the tenth business day of the semester).

This fee is \$6 for each weekday (excluding Saturdays, Sundays, and legal State holidays) occurring after the tenth day of the semester that registration and payment have not been completed. Students granted a limited deferment by the Deferment Office (in the Wilbur Cross Building) are charged the late fee if they fail to meet any of the terms of the deferment. For these students, the fee begins to accumulate on the first business day following a deferment date. Students whose semester bills are only for Continuing Registration courses (GRAD 398, 399, 498, or 499) are not eligible for a deferment.

This fee will accumulate to a maximum of \$60, at which point the student's registration may be cancelled. To become reinstated, the student must apply for reinstatement and pay a reinstatement fee of \$65. (See "Reinstatement Fee.") The registration process has not been completed unless the student has either received a fee bill receipt from the Bursar or has been granted a limited deferment of the payment date of the semester fee bill by the Deferment Office.

### Reinstatement Fee

Graduate School regulations require registration in each semester by all graduate degree program students. (See "Continuing Registration.") Students at the Storrs campus, at the Avery Point regional campus, the M.B.A. programs in Hartford and Stamford, or at the Health Center in Farmington who fail to complete initial course registration by the end of the tenth day of classes of any semester may be dropped from active status and will be required to pay a penalty fee of \$65. (Additions to and deletions from a student's initial registration and payment of the resulting adjusted fee bill can occur freely through the end of the tenth business day of the semester.) The reinstatement fee is added to a student's bill along with any late registration/payment fee that has accrued.

A student who has an unpaid reinstatement fee is not allowed to register, have an official transcript issued by the Registrar's Office, obtain a deferment of any fee payment date, retain a key to a room in the Graduate Center, or use the services of the Babbidge Library. A student with an unpaid reinstatement fee is not considered to be in good standing by the Graduate School. (See "Financial Responsibility.")

### Off-Campus M.B.A. and M.S. in Accounting Course Fee

Students registering through the off-campus Master of Business Administration programs at Hartford and Stamford do not pay a tuition fee, but do pay a fee of \$490 per credit, with no maximum for the semester. Information concerning this fee is available from the M.B.A. Program Director at each of the locations.

### Stamford Ph.D. in Educational Administration Program Fees

Students enrolled in the Ph.D. program in Educational Administration at the Stamford campus should obtain fee information from administrators of that program.

### Applied Music Fee

A non-refundable fee of \$150 for a weekly one-half hour lesson or \$200 for a weekly one-hour lesson per semester is charged all students receiving private instrumental or vocal instruction.

### Summer Sessions Fees

The bulletin published by the College of Continuing Studies, One Bishop Circle, Unit 4056, Storrs, Connecticut 06269-4056, should be consulted for information on these fees and payment.

### Extension Fees

The bulletin published each semester by the College of Continuing Studies, One Bishop Circle, Unit 4056, Storrs, Connecticut 06269-4056, should be consulted regarding fees and payment.

### Refunds and Cancellations of Charges

In order to be eligible for a refund or cancellation of charges, a properly signed schedule revision request card dropping *all* courses for which the student is registered must be filed with the Graduate Records Office if after the tenth day of the semester. (See "Dropping all Courses; Withdrawal from the Program.")

The University grants a full refund of fees to any student dismissed for academic deficiency or other cause, provided that the dismissal takes place prior to the start of classes. In certain other instances, including illness, full refunds or cancellations of charges may be made at the discretion of the Dean of the Graduate School, provided that the interruption or termination of the student's program takes place prior to the start of classes. A student inducted into military service will receive a prorated refund or cancellation of charges based on his or her date of separation. The student in this situation must furnish the Office of the University Bursar with a copy of the orders to active duty, showing this to be the reason for leaving the University.

Refunds or cancellations of charges are available on the following schedule for students whose programs are interrupted or terminated prior to or during a regular academic semester. When notice is received prior to the first day of classes of a semester, full refund (less nonrefundable fees) will be made if the fees have been paid in full. Thereafter, refunds or cancellations of refundable charges will be made according to the following schedule:

- |                               |     |
|-------------------------------|-----|
| a) 1st week*                  | 90% |
| b) 2nd week*                  | 60% |
| c) 3rd and 4th week*          | 50% |
| d) 5th week through 8th week* | 25% |

For graduate degree-seeking students who paid fees to the Office of Credit Programs, College of Continuing Studies, refunds are governed by the above schedule.

\* Calendar weeks run Monday through Sunday; regardless of the day of the week that the semester begins, the following Sunday ends the first calendar week.

## Summary of Nonrefundable and Refundable Fees

### Nonrefundable fees:

- Application Processing
- International Sponsored Student Fee
- Late Registration/Payment
- Reinstatement
- Room Deposit\*\*

### Refundable fees:

- Tuition
- General University
- Graduate Activities
- Graduate Matriculation
- Infrastructure Maintenance
- Applied Music
- Audit
- Deposit Account balance
- Cooperative Bookstore Account balance
- Board
- Residence Hall
- Room Deposit\*\*
- Transit

## Student Identification Card

Each newly entering student is furnished with a personal identification card which is revalidated each semester upon full payment of applicable fees. Should the student's card become lost or destroyed, a replacement will be issued for a fee of \$6.

## Students Attending Under Public Laws

Students attending the University for the first time under the auspices of the Veterans Administration must have a Certificate of Eligibility, which must be presented at the Office of Student Affairs prior to registration.

## Completion Fees

The Graduate School requires submission of two copies of a master's thesis or doctoral dissertation which become the property of the Homer Babbidge Library. Binding of these two copies is arranged by the Library. There is no charge to the student for the binding of the two final copies of a thesis or dissertation.

All doctoral dissertations are sent to ProQuest for microfilming. This is a requirement of the Graduate School. The student is required to pay ProQuest's charge for the service, which was \$55 at press time. This fee is subject to change at any time without notice. The master's thesis is *not* microfilmed.

There is an additional and separate charge (\$45 at press time; subject to change without notice) for the optional copyright of a doctoral dissertation.

## Student Parking Fee

A parking fee is assessed to each student who has permission to park in University parking areas during the two semesters of the academic year. The fee ranges from \$33 to \$40 per semester for commuting students, depending on the location of the assigned parking area, and is \$48 per semester for students residing on-campus. (See "Parking of Student Cars") The fee for graduate assistants is \$38 per semester, and it is \$29 per semester for resident assistants. In all cases, the parking fee is paid directly to Parking Services.

## Bad Checks

A \$15 fee is charged on any check returned by the bank for any reason.

## Mandatory Student Health Insurance

All full-time students must have adequate insurance coverage for accidents and illnesses. Students who currently are covered by personal or family health insurance must present evidence of such coverage to the Student Health Service by filling out a waiver card. Students who fail to provide proof of coverage via submission of a waiver card will be enrolled automatically in the University sponsored plan and will be charged a premium on their student fee bills.

Full-time students should inform the Student Health Service whenever a change occurs in their health insurance coverage, including any termination of health insurance benefits provided to graduate assistants.

All non-immigrant international students will be required, at the time of registration, to show evidence of adequate insurance coverage for basic medical, major medical, and repatriation expenses. This requirement is a condition of admission and registration. International students should consult the Division of International Affairs, Department of International Services and Programs, regarding compliance with this requirement and assistance in enrolling in an approved insurance program, if necessary.

## Telephone Service

All student rooms have been provided with telephone jacks. Students are encouraged to bring touch tone telephones to campus. Students who desire local and/or long distance services must register with UConnect, the University Telephone Service. UConnect will bill each student directly for the installation, monthly service charge, and toll calls.

Coin telephones and campus restricted phones can be found throughout the residential facilities.

\*\*See "Residence Hall Fee and Room Deposit" for explanation.

# ASSISTANTSHIPS, FELLOWSHIPS, & OTHER AID

The University of Connecticut has agreed to abide by the following resolution of the Council of Graduate Schools:

Acceptance of an offer of financial support (such as a graduate scholarship, fellowship, traineeship, or assistantship) for the next academic year by a prospective or enrolled graduate student completes an agreement that both student and graduate school expect to honor. In that context, the conditions affecting such offers and their acceptance must be defined carefully and understood by all parties.

Students are under no obligation to respond to offers of financial support prior to April 15; earlier deadlines for acceptance of such offers violate the intent of this Resolution. In those instances in which a student accepts an offer before April 15, and subsequently desires to withdraw that acceptance, the student may submit in writing a resignation of the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another offer without first obtaining a written release from the institution to which a commitment has been made. Similarly, an offer by an institution after April 15 is conditional on presentation by the student of the written release from any previously accepted offer. It is further agreed by the institutions and organizations subscribing to the above Resolution that a copy of this Resolution should accompany every scholarship, fellowship, traineeship, and assistantship offer.

Support for graduate students engaged in full-time degree study at the University comes from a wide variety of sources. More than 1,500 graduate students hold graduate assistantships for teaching or research, and more than 1,000 fellowships and traineeships are available to properly qualified students. Any employment within the University is subject to terms of the funding source and to approval by the Dean.

All students holding fellowships awarded by the University are expected to maintain their enrollment in the program to which the fellowship applies. Transfer from one program to another or withdrawal from the University terminates the fellowship.

The general University fee and the graduate matriculation fee as well as the Connecticut resident tuition fee or the nonresident tuition fee must be paid by holders of University Predoctoral

Fellowships, if applicable, but these fees are paid for holders of certain Federal fellowships and traineeships, according to the terms of the grant.

## TYPES OF FINANCIAL AID

Two general types of financial aid are available: (1) aid based on academic merit and (2) aid based on demonstrated financial need. The student is advised to apply for both types simultaneously in order not to delay consideration for an award.

Awards based on academic merit include: Graduate Assistantships (for teaching or research), University Predoctoral Fellowships, Dissertation Fellowships, and Summer Fellowships. Assistantships, fellowships and other awards from University sources are used in combination with need-based aid to calculate final financial aid amounts offered either for a semester or an academic year. Application for merit aid should be made directly to the academic department. Continuing University of Connecticut graduate students should apply early in the spring semester. New applicants for admission to the Graduate School should apply as early as possible and not later than the deadline imposed by the appropriate academic department. (See the Graduate Application form for merit aid deadlines.)

### General Need-Based Financial Aid Information

United States citizens or permanent residents of the United States may apply for need-based financial aid, which includes Federal Stafford Loans (FSL), Federal Work-Study (FWS), and University of Connecticut tuition remission grants, by completing the **Free Application for Federal Student Aid (FAFSA)** or Renewal FAFSA. With Internet access, you can file a FAFSA on the Web (or a Renewal FAFSA, if you still reside at your previous year's address) at <[www.fafsa.ed.gov](http://www.fafsa.ed.gov)>.

For more information, you can access the student financial aid web site at <[www.financialaid.uconn.edu](http://www.financialaid.uconn.edu)>.

### Need-Based Financial Aid Deadlines

Deadlines are March 1 each year for continuing graduate students and May 1 for entering University of Connecticut graduate students.

The FAFSA or Renewal FAFSA must be received and logged in at the federal processing center on or before the published deadline dates. List the University of Connecticut Federal School Code, 001417, on the FAFSA, Step 6. Use 233 Glenbrook Road, Storrs, CT as the college address. Do not wait for final income figures. Use the previous year's estimated income figures, if necessary, to meet the on-time application deadline.

On-time status will not be determined by postmark dates or postage receipts. Priority for the awarding of Federal Work-Study as well as University of Connecticut Tuition Remission Grant funds will be reserved for applicants who comply with the above deadlines. Applications received after the deadline will be considered for Federal Stafford Loan eligibility only.

[**Note:** International students are not eligible to receive need-based financial aid.]

An **award notification** is e-mailed to each student after all required documents have been received. It indicates the types and amounts of aid offered. Students must either accept or decline each award offer and return the **reply copy** to the Office of Student Financial Aid Services. Finalized financial aid awards (loans, grants, work-study) are based on the student's registration status (number of credits) as of the tenth day of classes in each semester.

All need-based financial aid recipients and University funded and merit scholarship recipients must meet **Satisfactory Academic Progress (SAP)** requirements, which are based on federal regulations. These requirements include maintenance of an appropriate grade point average and satisfactory completion of a percentage of the number of credit hours attempted in each award year. A complete text of this policy is available from the Office of Student Financial Aid Services.

The following list of assistantships, fellowships, and other forms of aid includes only the major sources of support available to students at this University. Other sources may be available upon further inquiry.

### Graduate Assistantships

Graduate School degree-seeking students and students in the program leading to the Sixth Year Diploma in Professional Education, who meet the criteria listed below, are eligible. Appointments ordinarily are made for the nine-month period, August 23 through May 22, but may be of shorter duration for a variety of reasons. Recipients usually serve the University as teaching assistants, readers, or laboratory and research assistants. They may take fewer than the usual number of courses per year because of this added workload. To be appointed, to retain an appointment, or to be reappointed, a student must have been accorded Regular (not Provisional) status, must have been maintaining a cumulative average of at least B (3.00) in any course work taken, must be eligible to register (i.e., must not have more than three viable grades of Incomplete on his or her academic record), must be enrolled in a graduate degree program scheduled to extend through the entire period of the appointment or reappointment, and must be a full-time student, counting course work and/or its equivalent together with assistantship duties (see "Course Loads"), throughout the period.

The holder of a full assistantship devotes one-half of available time to studies and one-half (approximately 20 hours per week) to assistantship duties, while the holder of a half assistantship ordinarily devotes three-quarters of available time to studies and one-quarter (approximately 10 hours per week) to assistantship duties. Assistantships are not available for less than 10 hours per week.

Ordinarily, a graduate student is not permitted to earn more in a given academic year than the applicable maximum stipend rate indicated below. With the written recommendation of the student's advisory committee and the consent of the Dean of



the Graduate School, however, approval may be granted for a student's earnings from University sources to exceed the maximum stipend rate by a limited and specified amount.

Stipend rates for graduate assistants are graduated in terms of progress toward the advanced degree and experience. Ordinarily, a graduate assistant may not exclude any part of the stipend from U.S. taxable federal gross income. The rates for nine months for the 2003-2004 academic year are as follows:

- I. \$16,556 for graduate assistants with at least the baccalaureate.
- II. \$17,426 for experienced graduate assistants with at least the master's degree or its equivalent in the field of graduate study. (Equivalency consists of twenty-four credits of appropriate course work beyond the baccalaureate, together with admission to a doctoral program.)
- III. \$19,369 for students with experience as graduate assistants who have at least the master's degree or its equivalent and who have passed the doctoral general examination.

Tuition (but not the General University Fee, the Graduate Matriculation Fee, or other fees) is waived for Graduate Assistants. (See "Tuition," for possible proration.) If an assistantship begins or terminates during the course of a semester, tuition will be prorated on a weekly schedule – charged for that portion of the semester when the assistantship is not in force, waived when it is in force. This often results in an adjustment of the tuition charges, including partial assessment (if the student is registered throughout the semester for course work for which tuition is charged) or a partial refund (if tuition has been paid).

A graduate assistant is eligible for health insurance. Graduate assistants should be aware that it is necessary to complete the proper forms to activate the health insurance. The health insurance does not take effect automatically.

In exceptional cases a graduate assistant may be appointed on a twelve-month basis, with the stipend being increased proportionately. There are, however, no additional benefits or waiver of tuition in the summer months.

When students become eligible for the Level II or Level III stipend rate, it is the responsibility of their department to request such an increase promptly, by filing a new employment authorization effective the first day of the biweekly payroll period following the date on which the student completes master's degree requirements (or satisfies master's degree equivalency) or the date on which the student passes the doctoral General Examination in its entirety. Students are responsible for ascertaining that any required documentation — such as a report of a master's final or doctoral general examination, a transcript, or a report of a pertinent Incomplete grade made up — is promptly filed with the Graduate School and that their current stipend conforms with their eligibility.

### Tuition Assistance Program for Outstanding Master's Degree Students

This program provides tuition assistance for selected students, who are classified as out-of-state for tuition purposes, in terminal master's degree tracks. A limited number of tuition grants are awarded each year on a competitive basis to out-of-state master's students. These grants permit the selected students, in effect, to pay tuition at the in-state rate. The specific selection criteria for these grants include: admission to and full-time matriculation in a master's degree program which ordinarily does not lead to the doctorate, absence of graduate assistantship support (which carries with it tuition waiver), out-of-state residency status, evidence of academic excellence (based on grade point averages, GRE/GMAT scores, etc.), and U.S. citizen or permanent resident status. Each student chosen for participation in this program is eligible for a maximum of four semesters of support. This program is administered by the Graduate School. Students are nominated by faculty members in terminal-track master's degree programs.

### University Predoctoral Fellowships

These are awarded by the Graduate School on the recommendation of the graduate faculty in the degree program concerned. Students who intend to earn the D.M.A. or Ph.D. and who have demonstrated capability for completing a doctoral program may apply for such fellowships at any stage of their graduate career. Award amounts range from small amounts to full fellowships and/or tuition equivalency. Fellowship awards do not include the requirement of teaching, research, or any other service duties and are not considered to be employment. Predoctoral Fellows must be Regular (not Provisional), full-time students, regardless of the amount of the fellowship. Recipients must present evidence of such registration and payment or deferment of appropriate fees upon receipt of fellowship checks. The Dean of the Graduate School may cancel or reduce an individual award if the student fails to maintain satisfactory academic and financial standing.

### Doctoral Dissertation Fellowships

Limited funding will be available during the academic year to support the Doctoral Dissertation Fellowship program, which is designed to assist advanced Ph.D. students to complete their dissertations. Minimum eligibility requirements include having passed the doctoral general examination, having a fully approved dissertation proposal on file with the Graduate School, and not exceeding certain annual income limits. Each eligible student may apply for a maximum of \$2,000; the fellowships are "one-time only" awards. Awards will be made via announced competitions, which means that not all eligible students will receive a fellowship. Students may request additional information concerning eligibility and application procedures from Thomas Peters, Program Director, Unit 1006, Whetten Graduate Center, room 208, Storrs, Connecticut 06269-1006; telephone (860) 486-0977; e-mail <thomas.b.peters@uconn.edu>.

### Doctoral Dissertation Extraordinary Expense Award

Ph.D. students who have passed the general examination and whose dissertation proposal has been fully and officially approved may apply for up to \$500 for non-routine expenses directly related to data collection for the dissertation. Eligible students may apply at any time. Application forms be obtained from Thomas Peters, Program Director, Unit 1006, Whetten Graduate Center, room 208, Storrs, Connecticut 06269-1006; telephone (860) 486-0977; e-mail <thomas.b.peters@uconn.edu>.

### Summer Fellowships for Doctoral and Pre-Doctoral Students

Students pursuing the D.M.A. or Ph.D. degree are eligible, upon nomination by department heads, for up to \$1,500 during the summer for the general examination or dissertation research. Information is available from department and program heads in March of each year.

### Part-time Employment

**Federal Work-Study (FWS)** is a federally funded financial aid work program for students with a demonstrated financial need, as determined by information submitted on the FAFSA. Unlike other forms of aid, a Federal Work-Study award is not applied to a student's fee bill. Students receive bi-weekly paychecks for hours worked.

The **Student Labor Program** is a work program open to all University of Connecticut students and designed to supplement regular staff with students seeking part-time employment.

The Office of Student Financial Aid Services advertises available positions on their website: <[www.studentjobs.usconn.edu](http://www.studentjobs.usconn.edu)>. Students are prompted to select the category their job choice(s) and are provided with a list of supervisors seeking candidates for those jobs. Students then arrange interviews with prospective employers to discuss the details of the job.

### Federal Loan Programs

**Federal Stafford Loans (FSLs)** are offered to students attending the University at least half-time. Subsidized FSLs are based on financial need; the interest on these loans is subsidized by the federal government. If a student does not qualify for a subsidized FSL, he or she may borrow an unsubsidized FSL. The student is responsible for the interest which accrues on the loan, and has the option to either pay the interest while in school or defer payment of the interest until repayments begin, six months following graduation.

Annual loan limits for eligible graduate students are: \$8,500 in Subsidized FSL and \$10,000 in Unsubsidized FSL per academic year. The maximum aggregate FSL (Subsidized and Unsubsidized) amount a graduate student may hold is \$138,500.

An excellent, detailed source of information regarding federal aid programs and the financial aid process is *The Student Guide*, available at college and university financial aid offices.



### Graduate Student Senate Short-Term Loan Fund

This fund is administered by the Graduate Student Senate (GSS), and is generated by graduate student activities fees. It provides loans of up to \$500 to assist graduate students in dealing with financial emergencies. Loans are issued for 60-day periods and are interest free. Borrowers are urged to repay these loans on time so that other students in need can be accommodated. Applications are available in the Graduate Student Senate Office, Room 318, Whetten Graduate Center and online at the GSS Web site <<http://www.grad.uconn.edu/~wwwgss>>.

### Dean of Students Office Short-Term Emergency Loan Fund

Short-term emergency loans are available through the Dean of Students Office. Graduate students who have encountered unforeseen financial difficulties that pose a hardship to their student status may apply. Students must be currently registered and degree-seeking to be eligible. To apply, stop by the Dean of Students Office located in the Wilbur Cross Building, room 202. The office telephone number is (860) 486-3426.

### Special Graduate Student Fellowships

These fellowships provide financial assistance for newly-entering, full-time regular (not provisional) master's and doctoral students who are United States citizens or Permanent Residents (immigrants). Priority is given to students in their first year of graduate study at the University of Connecticut, Storrs campus. Application deadlines are May 1 for fall semester and December 1 for spring semester. Applications and information regarding eligibility may be obtained by writing to Office of the Vice Provost and Dean, 438 Whitney Road Extension, Unit 1006, Room 206, Storrs, Connecticut 06269-1006.

### Aid for International Students

Before their admission is complete and a student visa can be issued, non-immigrant international students must present documentary evidence of their ability to meet all expenses for at least the first year of study, together with an acceptable plan for financing the remainder of their program. International applicants are not eligible for need-based financial aid.

University Scholarships, providing tuition and the general University fee, are available to a small number of international students who are sponsored by certain organizations [e.g., ATLAS and LASPAU] recognized by the Graduate School as being devoted to the promotion of advanced education programs and with which the University has a standing agreement.

### Veterans Administration Educational Assistance & Tuition Waiver Program

The Office of Student Financial Aid Services provides information concerning benefits under the various educational assistance programs provided by the Veterans Administration. Students who attend the University and receive educational

assistance under the following chapters must contact the Office of Student Financial Aid Services prior to the beginning of each semester: Chapter 31 (Vocational Rehabilitation Training Act for Disabled Veterans); Chapter 32 (Post-Vietnam Veterans Educational Assistance); Chapter 35 (Dependents Educational Assistance Act: children, wives, and widows of totally disabled and deceased veterans - service connected deaths); Chapter 1606 (Montgomery G.I. Bill - Selected Reserve); Chapter 30 (Montgomery G.I. Bill - Active Duty). Veterans must notify the University every semester of their registration for certification of enrollment. Any changes in veteran status (credit load, withdrawal, etc.) must also be reported promptly to the University.

Additionally, veterans may qualify for a tuition waiver under the State of Connecticut tuition waiver program. Veterans must provide a form DD214 (separation of service) and must be recognized as a resident of Connecticut at the time of admission or readmission to the University. Please see the tuition waiver criteria in the "Fees and Expenses" section of the catalog.

Veterans seeking tuition waiver applications or assistance should contact the Office of Student Financial Aid Services, 233 Glenbrook Rd., U-116, Wilbur Cross Building room 102, Storrs, Connecticut 06269-4116 or call (860) 486-2819.

### Named Graduate School Fellowships

These fellowships are awarded annually by the Graduate School, in cooperation with academic departments, to outstanding graduate degree students. Annual remuneration consists of a service-free stipend of \$6,000 from The Graduate School and a 50% appointment as a graduate assistant from a participating academic department. Pertaining to the latter, there is a service requirement not to exceed ten hours per week of instructional or other duties ordinarily assigned to a graduate assistant. Only newly admitted doctoral students are eligible for appointment to the first year of a fellowship. An initial appointment (of a first-year fellow) may be renewed once with the recommendation of the fellow's advisory committee and the approval of the Dean of the Graduate School. No student may hold a Named Graduate School Fellowship for more than two years. Eligible students must meet the conditions established for appointment as a graduate assistant, but approval by the Dean of the Graduate School ordinarily is contingent upon academic credentials indicative of truly outstanding quality. Named Graduate School Fellowships currently offered include:

- Anthropology – The Edward Grant Burrows Graduate School Fellowship
- Biomedical Science – The Irwin H. Lepow Graduate School Fellowship
- Cell Biology (Storrs) – The Heinz Hermann Graduate School Fellowship
- Chemical Engineering – The Leroy F. Stutzman Graduate School Fellowship
- Chemistry – The Harvey S. Sadow Graduate School Fellowship

- Communication Science – The Homer D. Babbidge, Jr. Graduate School Fellowship
- History – The Robert W. Lougee Graduate School Fellowship
- Linguistics – The Roman Jakobson Graduate School Fellowship
- Metallurgy – The James A. Ruppen Graduate School Fellowship
- Nutritional Science – The Hamilton D. Eaton Graduate School Fellowship
- Pharmaceutical Science – The P. Brian Stuart Graduate School Fellowship
- Physics – The Charles A. Reynolds Graduate School Fellowship
- Physiology – The Edward G. Boettiger Graduate School Fellowship
- Political Science – The G. Lowell Field Graduate School Fellowship
- Polymer Science – The Julian F. Johnson Graduate School Fellowship
- Psychology – The David Zeaman Graduate School Fellowship

The Graduate School offers two other fellowships, in cooperation with participating academic departments, which are available to eligible students.

These fellowships are supported jointly by Special Graduate Student Fellowship funds from the Graduate School and a 50% Graduate Assistantship from the department with which the recipient is affiliated. Only one student holds each fellowship at any given time, renewable annually, and the fellowship may not be held by the same person for more than two years. Candidates for these fellowships may be recommended to the Dean of the Graduate School by any graduate faculty member. These recommendations must be endorsed by the appropriate department head.

1) The Prudence Crandall Graduate School Fellowship honors Miss Crandall's contributions to the education of African-American youth in nineteenth century America.

2) The Rafael Cordero Graduate School Fellowship honors Maestro Cordero's contributions to education in nineteenth century Puerto Rico.

### Multicultural Scholars Program

The Graduate School and the Chancellor's Office have established a fund for the promotion of diversity within graduate education. This program functions to promote the recruitment and retention of diverse populations of graduate students by matching the funding support provided by schools, departments, or fields of study. Students are nominated by the graduate program to which they are applying. There is no application form. Eligibility for support is based on the student's academic qualifications, U.S. citizen or permanent resident status, and the demonstrated need for increased cultural diversity within the field of study.

### Outstanding Scholars Program

The Graduate School and participating academic departments and programs offer a number of fellowships for new outstanding graduate students pursuing study at (or through) the doctoral level.

Each award includes a stipend of \$7,000 for the academic year, provided by The Graduate School, and a half graduate assistantship for each of the fall and spring semesters, which is provided by the department or program. The award is renewable for two additional years (a total period of three years). There is no application form. Each doctoral field of study should recommend as early in the recruiting year as possible applicants who intend to commence graduate study in the following Fall semester.



### **Aid for Graduate Students in Specific Disciplines or Areas**

Awards are available in the areas of study listed alphabetically below. Availability and terms of the following awards are subject to change at any time without notice.

#### **Accounting**

The Connecticut Society of Certified Public Accountants Ph.D. Scholarship is an award of \$1,500. The award is made to a doctoral student pursuing the Accounting concentration on the basis of academic excellence and professional promise. Application is made by February 1 to the Department of Accounting, Unit 1041A, Storrs, Connecticut 06269-1041.

#### **Agricultural and Resource Economics**

Several graduate research assistantships in food marketing, resource economics, and international agricultural development are available. Application is made to the Department of Agricultural and Resource Economics, Unit 4021, Storrs, Connecticut 06269-4021.

#### **Allied Health**

The Frederick G. Adams Scholarship was established by the faculty of the School of Allied Health to honor their first Dean, Frederick G. Adams, D.D.S., with continuing support from his family and friends as a memorial. Awards in varying amounts are made to undergraduate and graduate students enrolled in the School of Allied Health who have emergency needs which can be met in no other way. Application is made to the School of Allied Health Academic Advisory Center.

The Dr. James P. Cornish Scholarship was established by the Cornish family in memory of the late Dr. Cornish. The \$500 scholarship is awarded annually to a graduate student in the School of Allied Health who demonstrates leadership potential, warmth and humor, creativity and innovation, commitment to lifelong learning and service, and dedication to the values of multiculturalism and diversity. Application is made to the School of Allied Health Academic Advisory Center.

The Leslie Finney Laughlin Scholarship provides support for students in Physical Therapy.

#### **Animal Science**

Graduate research assistantships from various sources, including federal grants as well as business and industry, are available. There is no application. Requests for financial aid upon admission

are considered during the review of applications. Ordinarily, students are nominated for scholarships by their major advisors. Assistantships and scholarships are awarded on the basis of academic and scholarly achievement as well as the potential for future academic and professional accomplishments.

#### **Art**

(See "Fine Arts.")

#### **Biomedical Sciences**

Graduate assistantship awards for qualified incoming and current students are available. Recipients must be full-time students and work with faculty advisors at the Health Center. Awards include assistantship stipend, waiver of tuition and University fees, and health insurance. Current students apply to the Graduate Programs Committee at the Health Center. Incoming students are recommended for this award by the Biomedical Admissions Committee. Students applying for admission and assistantship consideration to commence study in the following fall semester should apply by January 1.

#### **Business Administration**

The T. K. Lindsay Scholarship is an annual award established by the Connecticut Bank and Trust Company in honor of Professor Tamlin K. Lindsay to be given to an outstanding undergraduate or graduate student in the School of Business. Criteria for selection include high scholastic achievement, professional promise, participation in University activities, and financial need. Candidates are chosen by a Scholarship Committee chaired by the dean of the School of Business.

#### **Chemical Engineering**

Various fellowships are available to qualified graduate students enrolled in the M.S. and Ph.D. programs in chemical engineering. Prospective graduate students are considered automatically for this aid by the graduate admissions committee in chemical engineering.

#### **Chemistry**

The Charles E. Waring Memorial Scholarship is awarded each year to an outstanding graduate student in chemistry. The recipient is selected from among those students who have completed two or three semesters of graduate study and who have qualified for admission to the Ph.D. program. This \$250 award is given on the basis of progress in course work and research. There is no application.

#### **Civil Engineering**

The Narasimha Rao Adidam Memorial Scholarship was established by Dr. and Mrs. Adidam S. R. Sai of Kanpur, India in memory of their son, Naren. The award is presented annually to a full-time graduate student in Civil Engineering who is pursuing studies related to structures/applied mechanics. Preference is given to students with financial need who best exhibit the qualities of personal integrity and intelligence, the research aptitude, the academic performance and the understanding of multicultural values as personified by Narasimha Rao Adidam. Nominations are solicited from faculty members by the Civil Engineering Awards Committee in March.

The Edson B. Gerks Award recognizes an undergraduate or graduate student interested in

Transportation Engineering who shows outstanding promise. The award is administered through the Department of Civil and Environmental Engineering.

The University Transportation Center Fellowship for Transportation Studies offers a stipend of up to \$5,000 per semester (in addition to a 50%-time graduate assistantship) for full-time graduate study in Civil Engineering with emphasis in one or more of the following areas: transportation management, policy, or operations. Expressions of interest should be forwarded to Unit 2037, Storrs, Connecticut 06269-2037 as soon as possible after admission to graduate study.

#### **Communication Sciences**

The Department of Communication Sciences has a number of stipends available to qualified graduate students enrolling in the Master's programs in Communication and in Speech, Language, and Hearing. In addition, aid is available to students enrolling in the Ph.D. programs in Communication Processes and Marketing Communication and in Speech, Language, and Hearing. Application is made to Head of the Department, Department of Communication Sciences, Unit 1085, Storrs, Connecticut 06269-1085.

#### **Computer Applications and Research**

The Taylor L. Booth Center for Computer Applications and Research provides a limited number of graduate assistantships. The major responsibilities for these positions are: assisting the technical staff in setting up and maintaining networked research and educational laboratories with PCs and workstations; providing support for technical seminars and short courses on available facilities and software systems; and assisting users with system usage and software problems. Application is made to the Booth Research Center, Unit 1031, Storrs, Connecticut 06269-1031.

#### **Computer Science and Engineering**

The Taylor L. Booth Graduate Fellowship is awarded on the basis of annual competitions to qualified graduate students in Computer Science and Engineering who intend to pursue a faculty career at an American university upon completion of the Ph.D. at the University of Connecticut. Interested students should submit a letter of application which details career goals and emphasizes experience and contributions as a teacher. Additionally, letters of support, including one from the applicant's major advisor, should be sent to the Chair of the Graduate Admissions Committee, Department of Computer Science and Engineering, Unit 3155, Storrs, Connecticut 06269-3155. Application deadlines and information can be obtained by writing to the same address.

#### **Dental Science**

A limited number of graduate assistantships are available to students in the Master of Dental Science and the combined Ph.D. /resident programs and are awarded on a competitive basis. Training fellowships for research and clinical programs also are available. Application is made to the Office of Dental Academic Affairs, Room AG036, University of Connecticut Health Center, Farmington, Connecticut 06030-3905.



### Dramatic Arts

(See also "Fine Arts."). Information, including application procedures, can be obtained from the Department of Dramatic Arts, Unit 1127, Storrs, Connecticut 06269-1127.

The Ballard Institute and Museum of Puppetry Award is given to an undergraduate or to a graduate student in puppetry who has maintained an excellent scholastic record and who has demonstrated exceptional talent in puppetry.

The Frank W. Ballard – UConn League Scholarship is awarded annually to an undergraduate and/or to a graduate student majoring in Puppetry in the Department of Dramatic Arts. The award is given on the basis of demonstrated talent, contribution to department productions, and professional promise.

The Victor Borge Scholarship is awarded to a current or to an incoming M.F.A. student in acting.

The Connecticut Repertory Theatre Patrons' Award was established through the generosity of patrons of the Connecticut Repertory Theatre. The award is made to undergraduate or graduate students in Dramatic Arts on the basis of outstanding academic and artistic accomplishment.

The Cecil E. Hinkel Department of Theatre Award is given to a graduate student who preferably has excelled in either dramatic form and structure or in the history of theatre. Secondary preference would be given to an outstanding graduate student in directing.

The Nafe E. Katter-Ron Palillo Scholarship in Acting is awarded to an undergraduate or to a graduate student majoring in acting. The award is made on the basis of demonstrated talent, contributions to departmental productions, and professional promise.

The Valerie M. Schor Memorial Scholarship is in memory of Professor Schor, who taught Dramatic Arts from 1970-1993. Awarded annually to undergraduate or graduate students majoring in acting.

The Special Dramatic Arts Award for Excellence is given to an undergraduate or graduate student in Dramatic Arts on the basis of outstanding academic and artistic accomplishment.

The United Bank and Trust Company Scholarship is awarded on the recommendation of the faculty of the department to a talented student in either the design/technical or performance areas.

The George B. Wallis III Award is presented at the end of the theatre season to a student judged by the faculty of the department to be the best actor or actress, with emphasis on talent and dramatic ability.

### Ecology and Evolutionary Biology

The Ronald Bamford Fund provides a small research grant in the area of botany to be awarded to graduate students in the Department of Ecology and Evolutionary Biology for visits to collections, field work, supplies, or other expenses directly related to research. Application is made to the Department Head, Ecology and Evolutionary Biology, Unit 3043, Storrs, Connecticut 06269-3043.

Several endowed funds provide small research

grants in various research areas that are awarded to graduate students in the Department of Ecology and Evolutionary Biology for travel to scientific meetings, visits to collections, field work, supplies, or other expenses directly related to research. The endowed funds and research areas are: Henry N. Andrews Fund (botany), Alfred Hunyadi Fund (forestry), Jerauld Manter Fund (ornithology), Lawrence R. Penner Fund (parasitology and invertebrate zoology), James A. Slater Fund (entomology), Francis R. Trainor Fund (aquatic ecology), and the Ralph M. Wetzel Fund (vertebrate biology). Application is made to the Department Head, Ecology and Evolutionary Biology, Unit 3043, Storrs, Connecticut 06269-3043. Deadlines are variable but often have been April 15.

### Economics

The Audrey P. Beck Scholarship is shared between Economics and Political Science. A stipend of \$500 (or more, depending on endowment return) is awarded to a student with an interest in a career in public policy. Criteria for the award include career potential, academic achievement, character, breadth of interests, and need.

The W. Harrison Carter Award is given each fall to a graduate student judged to be the best teaching assistant in the Department of Economics. The award was established in memory of W. Harrison Carter, Professor of Economics from 1931 to 1966 and former Dean of the College of Liberal Arts and Sciences.

The Abraham Ribicoff Graduate Fellowship for the Study of Economic Policy is awarded to an outstanding graduate student in Economics. The student must be a Connecticut resident with a strong academic record and must have a primary interest in the application of economic analysis to the formulation and implementation of state and national economic policies. Students are nominated by members of the faculty.

The Albert E. Waugh Scholarship in Economics provides an annual award to a graduate student interested in pursuing a career in teaching economics. This award was established in memory of a former professor of economics, Dean and Provost at the University from 1924 to 1965.

### Education

The Neag School of Education has numerous scholarships available. Information regarding these scholarships can be found on the Internet at the following website: <[www.education.uconn.edu/students/scholarships](http://www.education.uconn.edu/students/scholarships)>.

### Engineering

The Al Geib Graduate Fellowship is a supplemental fellowship to encourage top entering graduate students to conduct research on an environmental, sustained development topic. Preference is given to University of Connecticut graduates and to Connecticut residents. One or two awards may be given each year. Nominations are made through department heads and graduate field of study coordinators to the Dean of Engineering. The deadline for nominations is mid-February.

The Harold Torgersen Fellowship provides financial assistance to a graduate student in the

engineering fields. Preference is given to B.S. graduates of the University of Connecticut. Nominations are made to the Dean of Engineering by the appropriate Engineering Department Head.

### English

The Aetna Graduate Creative Nonfiction Prize provides one or more cash awards from the Aetna Foundation for an outstanding nonfiction essay.

The Aetna Graduate Critical Essay Prize is a \$400 award from the Aetna Foundation. Second, third, and honorable mentions may be awarded. Any essay or dissertation chapter which has not yet been accepted for publication is eligible.

The Kathleen Gibson McPeck Critical Essay Prize is a \$400 award given for an outstanding critical essay written by a graduate student. The award is given by James A. S. McPeck in memory of Kathleen Gibson McPeck. Any essay written for a course which has not yet been accepted for publication is eligible.

The Wallace Stevens Award for Poetry is offered in the spring semester. There are three prize awards. Undergraduate and graduate students are eligible. The award involves a brochure publication and a public reading.

### Finance

The Stephen D. Messner/School of Business Administration Scholarship and Fund provide support for undergraduate and graduate students in the areas of real estate and finance. Application is made either through the Real Estate Center or the Head of the Finance Department. There is no application deadline.

The Hartford Society of Financial Analysts' Scholarship is awarded under the auspices of the University of Connecticut Foundation. One or more scholarships of \$200 to \$500 are awarded each Spring semester to outstanding students enrolled in the master's degree program in the School of Business Administration. This scholarship is made available by the Hartford Society of Financial Analysts. Application is made to The Department of Finance, Unit 1041F, Storrs, Connecticut 06269-1041. The application deadline is March 1.

### Fine Arts

The Dean Jerome M. Birdman Scholarship is awarded annually to an undergraduate or graduate student in each of the departments of the School of Fine Arts. Criteria include academic distinction and professional promise. Awards are made by the dean of the school in consultation with department heads.

The William Brand Scholarship is awarded to an undergraduate or graduate student in the School of Fine Arts. The scholarship committee selects recipients based on past academic achievement and demonstration of potential for future academic and professional accomplishments. The scholarship is presented alternately to a student from each department.

The Jan Keiley Scottron Scholarship is awarded to an undergraduate or graduate student in the School of Fine Arts. The Scholarship Committee selects recipients who meet the following criteria: (1) senior student or graduate student standing with a major in

puppetry or musical stage (e.g., opera), (2) demonstrated financial need, and (3) demonstrated academic achievement.

The Rhoda Shivers Memorial Award in the Arts is awarded to an undergraduate or graduate student in the School of Fine Arts. Departmental Scholarship Committees select recipients based on past academic achievement, demonstration of potential for future academic and professional accomplishments, and on financial need. The scholarship is presented alternately to a student from each department (Art, Dramatic Arts, and Music).

### Geography

Graduate research assistantship awards for qualified incoming and current students are available. Recipients must be full-time students and work with faculty advisors. Awards include assistantship stipend, tuition waiver, and health insurance. Incoming and current full-time students who request graduate assistantships are considered for the research assistantship awards based on their academic standing and research skills. Several of the research assistantships are based at the University of Connecticut Center for Geographic Information and Analysis housed in the Homer Babbidge Library.

A graduate research assistantship is also supported by the Connecticut Geographic Alliance based in the Department of Geography. The Connecticut Geographic Alliance is an organization designed to advance the status of geography in primary and secondary education in Connecticut. The award includes assistantship stipend, tuition waiver, and health insurance. Incoming and current full-time students who request graduate assistantships are considered for this award based on their academic standing and interest in geographic education.

A departmental fund provides small grants to graduate students in the Department of Geography for presentations at scholarly meetings. Students in good academic standing who are participating in a scholarly meeting may apply to the Department Head for funding.

### Geological Sciences

The Andrew J. Nalwalk Memorial Award is given to a continuing graduate student demonstrating independent scholarship in geology, marine geology, or physical oceanography. Selection of the recipient is coordinated by the Department of Geological Sciences and the Department of Marine Sciences. The award was established by family and friends of the former professor of geology at the Marine Sciences Institute.

### Health Care Management

Criteria for selection for any of the following scholarship awards include full-time regular status in the M.B.A. degree program with an area of concentration in Health Care Management, prior academic achievement, perceived potential, and professional interest in health care management. Information and application forms are available through the Center for Health Systems Management, School of Business Administration, Unit 1041-CHSM, Storrs, Connecticut 06269-1041.

The Blue Cross and Blue Shield of Connecticut Healthcare Management Scholarship is awarded annually to a student preparing for a career in health

care management. Recipients receive \$6,000 in direct financial assistance for the two years of full-time study. Each recipient also is given full-time employment with the corporate organization during the summer between the first and second years of study and a paid internship during the second year of study. Preference is given to residents of Connecticut.

The Health Care Financial Management Consulting Scholarship is awarded annually to a student preparing for a career in health care financial management consulting. Recipients receive \$5,000 in direct financial assistance for the two years of full-time study. Each recipient also is given full-time employment with the sponsoring organization during the summer between the first and second years of study and a paid internship during the second year of study.

### History

The James M. Bozzuto Fellowship has been established in association with the Emiliana Pasca Noether Chair in Modern Italian History. It is named in memory of Mr. Bozzuto, whose family generously contributed to the Chair's endowment. The Fellowship is awarded to a graduate student of exceptional promise to undertake advanced study leading to the Ph.D. with an emphasis in Italian political, social, economic or cultural history since 1750 or with an emphasis in comparative European history in the same period that bears substantially on Italy (including emigration). Recipients of this fellowship shall be selected by the Financial Aid Committee of the Department of History in conjunction with the holder of the Noether Chair. The Fellowship normally is awarded on a triennial rotation. Information is available from the holder of the Noether Chair, Department of History.

The Aldo De Dominicis Graduate Fellowship in Italian American history is attached to the Emiliana Pasca Noether Chair in Modern Italian History and has been established to promote research into all aspects of Italian American history. The Fellowship, normally tenable for up to three years, is awarded to a graduate student of exceptional promise to undertake advanced study leading to a Ph.D. in an aspect of Italian American history. Recipients are selected by the Financial Aid Committee of the Department of History in conjunction with the holder of the Noether Chair. Applications close in January.

The Michael Dunphy Award is given annually to a graduate student with a strong interest in American government, society, history, or culture. Outstanding intellectual ability and financial need must be demonstrated. The History Department shares this award with Sociology and Political Science. The Department of History will name the winner in 1998, 2001, etc. Students are nominated by faculty members.

The Harry J. Marks Fellowship is awarded to a superior graduate student and, when appropriate, with priority given to one with a special interest in European social and intellectual history and who is returning to pursue an advanced degree while on, or after, working assignment as a high school teacher. The fellowship is named in honor of a late colleague who was esteemed for his teaching and

intellectual vitality. Recipients of this fellowship shall be selected by the Department of History Prize Committee.

The Roger Sherman Scholarship is awarded, when appropriate, to a distinguished applicant to the Ph.D. program in history. The award consists of a \$2,500 pre-doctoral fellowship, a one-half graduate assistantship, and a tuition waiver. Recipients are named by the Financial Aid Committee of the Department of History.

The Albert E. and Wilda E. Van Dusen Scholarship has been established through the generous gift of Professor Emeritus Van Dusen and his wife, Wilda. An annual scholarship is awarded to a graduate student in history who has completed at least nine credits of work, has demonstrated financial need, and ranks in the top one-quarter of graduate students in history. The selection of the recipient is made by the Department of History Prize Committee.

### Home Economics Education

The Merrillyn Niederwerfer '68 Cummings Award in Home Economics Graduate Education is granted to a graduate student in home economics education who is dedicated to a career in extension, secondary, or university education and who has shown promise and leadership in these fields. The \$400 award is made available by the Frank Niederwerfer Family Fund. For more information contact Dr. Mary Anne Doyle, Unit 2033, 249 Glenbrook Road, Storrs, Connecticut 06269-2033.

### Human Development and Family Studies

Graduate Research Fellowships in Gerontology are available through the Center on Aging and Human Development. The number of fellowships is limited. Fellowships are awarded on a competitive basis and are open to graduate students in all fields and programs. Apply by letter not later than June 1 to: Director, Center on Aging, School of Family Studies, 348 Mansfield Road, Unit 2058, Storrs, Connecticut 06269-2058.

### Judaic Studies

Students interested in obtaining further scholarship information should contact the Center for Judaic Studies and Contemporary Jewish Life, U-1205, (860) 486-2271.

The Harold J. Arkava Scholarship is named in honor of Harold J. Arkava. Awarded to student(s) in the Center for Judaic Studies and Contemporary Jewish Life, with preference given to those students studying the Holocaust. Priority is given to graduate students but undergraduates may apply. Number of awards and amounts to vary.

The Cohen and Henes Scholarship was established by Stephen I. Cohen, Class of 1965, and Robert L. Cohen, Class of 1967, in honor of their late grandparents, Isadore and Dora Cohen, and Samuel and Rebecca Henes of Waterbury, who came to the United States from Czarist Russia in the 1890's and who valued highly the qualities represented by this scholarship. Awarded to one or more students with an academic concentration in Judaic Studies on the basis of scholarship, financial need, high moral and ethical character, demonstrated commitment to community service.



Number of awards and amounts to vary.

The Winkler Israel Study Award is awarded to a student attending a college or a university in Israel in a program administered by the Study Abroad Office. Number of awards and amounts to vary.

### Latin American and Caribbean Studies

The Center for Latin American and Caribbean Studies has a limited number of graduate assistantships and predoctoral fellowships to award to qualified master's students planning to enter doctoral programs.

The Nathan L. Whetten Fellowship (which carries a small stipend) is awarded to the most outstanding doctoral student in any discipline with a concentration in Latin American Studies.

The Center also awards the Robert G. Mead, Jr. Fellowship to the best first-year M.A. student specializing in Latin America.

All fellowships are awarded on the basis of merit. Deadline for application is March 1st. Financial aid decisions are made only in the spring.

Application forms and further information are available from the Center for Latin American and Caribbean Studies, 843 Bolton Road, Unit 1161, Storrs, Connecticut 06269-1161; telephone (860) 486-4964; e-mail [lamsadm2@uconnvm.uconn.edu](mailto:lamsadm2@uconnvm.uconn.edu).

### Marine Science

(See also "Andrew J. Nalwalk Memorial Award" under Geology.)

The S.Y. Feng Scholarship Fund provides small research grants which are awarded to graduate students in the Department of Marine Sciences for travel to scientific meetings, field work, supplies and other expenses directly related to research. The award was established by family and friends of the late professor of marine sciences. Selection of recipients is made throughout the year by a committee of faculty members in marine sciences.

### Mathematics

Most graduate students receive financial support as teaching assistants. International applicants must have matriculated from an English-speaking university or have taken the SPEAK Test with a score of at least 50 or have taken the TOEFL with a score of at least 60 to be eligible for financial aid for the first year of graduate study. In addition, there are a few computer support and several Math Center tutoring positions. Supplemental fellowships are available to qualified applicants. Summer teaching opportunities are usually available, and advanced students are given research fellowships for one summer.

Under an agreement with Aetna and Hartford Life Insurance Companies, actuarial graduate students are eligible for internships that emphasize both practical experience and more theoretical research.

The Louis J. DeLuca Fellowship was established in memory of the former Associate Dean of the College of Liberal Arts and Sciences and Professor of Mathematics, who was a recipient of the University of Connecticut Alumni Association's Award for Excellence in Teaching. The fellowship is awarded each year to an outstanding graduate teaching assistant on the basis of teaching performance and academic achievement.

### Medieval Studies

The Fred Cazel Fellowship is an annual award open

to graduate students in Medieval Studies, especially those whose primary field is history.

### Modern and Classical Languages

Most graduate students receive financial support in the form of graduate teaching assistantships and graduate fellowships. In addition, research stipends of \$500-\$1,000 sometimes are available to qualified applicants during the summer, along with summer teaching opportunities.

The Jaime Homero Arjona Memorial Fund makes available non-interest-bearing, short-term loans to graduate students in the Department of Modern and Classical Languages. Application forms may be obtained in Room 228, J.H. Arjona Building.

The David Luckey Memorial Fund makes available non-interest-bearing, short-term loans (usually 60-90 days), with a maximum of \$200, to graduate students in the Department of Modern and Classical Languages. Application forms may be obtained in Room 228, J.H. Arjona Building.

The Josefina Romo-Arregui Memorial Scholarship consists of one or two scholarships of \$500 each to master's or doctoral students of Spanish or Spanish American Poetry or the Golden Age Theater in Spain. Application forms may be obtained in Room 228, J.H. Arjona Building.

### Music

(See also "Fine Arts.") The Victor Borge Scholarships are awarded in varying amounts to deserving School of Fine Arts students.

The Annie and Wilma Elias Memorial Scholarship was established through the generosity of Julius Elias in memory of his wife Wilma and his mother Annie. The scholarship is awarded annually to students who have been accepted into a program of study leading to a degree in music. Recipients are chosen based on past academic achievement and demonstration of future academic and professional accomplishments. Financial need may be a criterion but is not a determining factor. Two or more scholarships of a minimum of \$500 are available.

The Herbert A. France Music Scholarship is awarded under the auspices of the University of Connecticut Foundation to a junior, senior, or graduate student whose primary interest is conducting. This fund was established by a gift from Mrs. Olive France.

The Alice Murray Heilig Graduate Assistantship in Piano is offered. To be eligible for this assistantship, candidates must meet the following criteria: (1) full-time enrollment in the M.M., M.A., D.M.A. or Ph.D. program in the Department, (2) demonstrated promise as a pianist, and (3) demonstrated academic excellence. Recipients are selected by the Head of the Department in consultation with the Department's faculty.

The Charles, Alice (Murray), and Cheryl A. Heilig Scholarship is awarded annually. Priority is given to undergraduates, but the scholarship may be awarded to a graduate student who meets the standards set by the Scholarship Committee of the Department of Music.

The Minnie Helen Hicks Scholarship is awarded annually to one or more students in Music. Preference is given to residents of Connecticut. The basis for selection includes financial need and musical ability.

The Mae K. Kaplitz Memorial Scholarship Fund was established by Paul Kaplitz in memory of his wife, Mae K. Kaplitz. Awarded annually to students with financial need who are majoring in vocal performance and are outstanding contributors to University choral organizations.

The Musical Club of Hartford, Inc. – Evelyn Bonar Storrs Piano Scholarship is awarded to a talented graduate student of outstanding commitment pursuing study in piano. Student financial need is considered. If no graduate student meets these criteria, the scholarship may be awarded to an undergraduate.

The Walter H. and Rowena R. Tinker Scholarship was established in memory of Walter and Rowena Tinker, devotees of opera and other vocal music. The award is made to a sophomore, junior, senior, or graduate voice student for outstanding progress.

The Alexander-Hewitt Trust, Vera Jean Berg, Edward Evans, Eugene List/Carrol Glenn, Zara Nelsova, John Poellein, Nadja Salerno-Sonnenberg, Henryk Szeryng, J. Louis von der Mehden, and the Friends of Music Scholarships also are offered. Priority is given to undergraduate students, but graduate students who meet the standards established by the Department of Music Scholarship Committee also are eligible.

Students should contact the Department of Music, Unit 1012, Storrs, Connecticut 06269-1012 for information and application forms.

### Natural Resources

Several graduate research assistantships, graduate teaching assistantships, Bishop Carder Scholarships, and scholarships related to natural resources and the environment generally are available. Application is made to the Graduate Program Coordinator, Department of Natural Resources Management and Engineering, Unit 4087, Storrs, Connecticut 06269-4087.

### Neurosciences

The Neurosciences Area of Concentration Fellowships up to \$2,000 are awarded periodically to students (selected from those currently enrolled in the Neurosciences area of concentration) who have demonstrated the potential for excellence in research. Application is made to Chair, Neurosciences Committee, Unit 4156, Storrs, Connecticut 06269-4156.

### Nursing

In the spring semester, students may apply for funding from several scholarship funds and the Professional Nurse Traineeship Grant.

The Ralph and Ruby Gilman Scholarship honors the Gilmans' 50 years of service to the Mansfield and university communities. Dr. Gilman was hired in 1931 as the University's first full-time physician. Mrs. Gilman helped to establish the Public Health Nursing Association. Undergraduate and graduate students in Nursing are eligible. The scholarship is to be used for tuition and fees.

Newly established funds that can support graduate students include the School of Nursing Endowment Fund for Excellence, and the Mary and Katherine Connelly Nursing Scholarship.

Professional Nurse Traineeships are available for qualified full-time graduate students in Nursing.

Based on the availability of funds, traineeships cover student tuition and fees. Interested students should request application materials and information concerning deadlines from the School of Nursing Academic Advising Services, Unit 2026, Storrs, Connecticut 06269-2026. Materials also are available on-line at <<http://www.nursing.uconn.edu/MSFINAN.HTML>>.

### Nutritional Science

The Janina M. Czajkowski Community Nutrition Scholarship is awarded each year to a graduate student in nutritional sciences. The recipient receives a certificate and a monetary award. The award is based on academic excellence in community nutrition, potential for scholarly achievement, and need. The scholarship was established by the friends of Dr. Janina M. Czajkowski Esselen, a Professor Emerita, who established the department's community nutrition program. The scholarship is awarded by the faculty of the department. There is no application.

The Elna E. Daniels Loan Fund makes available short-term, non-interest-bearing, small loans to graduate students in nutritional science. Application is made to Head of the Department, Department of Nutritional Sciences, Unit 4017, Storrs, Connecticut 06269-4017.

The Lloyd D. Matterson Scholarship is awarded each year to a graduate student in nutritional science. The student receives a certificate and a monetary award. The award is based on research accomplishment and potential for scholarly achievement in an area of nutritional science for students in the final phase of completing the degree program. The scholarship was established by Mrs. Lloyd D. Matterson and Professor Matterson's colleagues in memory of Dr. Matterson, a distinguished nutritionist and Professor Emeritus in the Department of Nutritional Sciences. The scholarship is awarded by the nutritional sciences faculty. No application is made.

### Pharmaceutical Science

The American Foundation for Pharmaceutical Education (AFPE) Fellowships are annual awards of approximately \$6,000-\$10,000 for students currently enrolled in graduate study leading to the Ph.D. degree in pharmaceutical science. Application is made to the American Foundation for Pharmaceutical Education, One Church Street, Suite 202, Rockville, Maryland 20850.

The Boehringer Ingelheim Fellowship in Pharmaceutical Sciences supports advanced graduate students in the areas of medicinal and natural products chemistry, pharmaceuticals, or pharmacology (but not toxicology). The recipient must be in at least the third year of graduate study in the department. Application is made to the Pharmaceutical Sciences Graduate Affairs Committee early in the Spring semester. The fellowship is for one year and may be renewed for one additional year.

Boehringer Ingelheim Pharmaceuticals, Inc. makes available a graduate fellowship in toxicology. Application is made to the director of the toxicology program in the School of Pharmacy.

The Gerald J. Jackson Memorial Fellowship in

pharmaceuticals is awarded to a deserving graduate student who holds an undergraduate degree in Pharmacy. Application is made to the Graduate Affairs Committee in the School of Pharmacy.

The Richardson-Vicks/A. Francis Summa Memorial Award supports research activity in the School of Pharmacy. Application is made to the Graduate Affairs Committee in the School of Pharmacy.

### Physics

Virtually all graduate students accepted into the Ph.D. program, and many accepted into the M.S. program, receive financial support in the form of teaching and research assistantships and fellowships. Special scholarship and fellowship support is available for exceptionally qualified graduate students. The Physics Department has substantial external support for research programs, and funded programs generally provide research assistantships (most with supplementary summer support). Ph.D. students who perform satisfactorily and make good progress receive financial support until they complete requirements for the Ph.D. degree.

The Physics Department annually awards the Charles A. Reynolds Fellowship to an outstanding applicant to its graduate program, and the Marshall J. Walker Outstanding Teaching Assistant Award to the graduate student judged to be the most effective teaching assistant. *Outstanding Scholar* Awards also are available for very exceptional applicants to the Ph.D. program.

Further information about the Physics Department's academic and research programs is available at the Physics Department website at [www.phys.uconn.edu](http://www.phys.uconn.edu) and from a brochure that can be found on the website or requested by mail or e-mail at [physadm@uconnvm.uconn.edu](mailto:physadm@uconnvm.uconn.edu).

### Plant Science

Sources of support for graduate students in all areas of concentration include: (1) Graduate research assistantships, from various sources including government and industry. (2) Teaching assistantships. (3) C. B. Burr Memorial Scholarships. (4) Bishop-Carver Scholarships. (Eligibility for these is restricted to graduate students who are residents of Connecticut.) There is no application for any of these awards. Requests for financial aid on admission are considered during the review of applications. Students are nominated for scholarships generally by the major advisor. Assistantships and scholarships are awarded upon the recommendation of the faculty of the department, on the basis of academic and scholarly achievement, and the potential for future academic and professional accomplishments.

### Political Science

The Fund for Legal Studies Fellowship is awarded annually to a graduate student in Political Science who specializes in public law. The recipient is selected by the Department of Political Science.

The Audrey P. Beck Scholarship is shared among Economics, History, and Political Science. A stipend of \$500 (or more, depending on endowment return) is awarded to a nominated student with an interest in pursuing a career in

public policy. Criteria for the award include career potential, academic achievement, character, breadth of interests, and need.

The Michael Dunphy Award is given annually to a graduate student with a strong interest in American government, society, history, or culture. Outstanding intellectual ability and financial need must be demonstrated. The Political Science Department shares this award with History and Sociology. The Department of Political Science will name the winner in 1996, 1999, etc. Students are nominated by faculty members.

The Ilpyong Kim Fellowship is awarded annually to a graduate student in political science who is conducting dissertation research related to Asia. The recipient is selected by the Department of Political Science.

The Norman Kogan Fellowship in Western European Politics is given annually to a graduate student in political science who specializes in the study of Western European politics.

The Governor Abraham Ribicoff Fellowship in American Politics is awarded annually to a graduate student in political science who specializes in the study of American politics. Preference is given to residents of Connecticut. The recipient is selected by the Department of Political Science.

### Polymer Science

Graduate assistantships for Ph.D. students are offered by the Polymer Program.

Several special fellowships are also available for exceptional graduate students. These include the Andrew Garton Scholarship Award, the Julian Johnson Named Graduate School Fellowship, the Stephanie H. Shaw Scholarship, and the Shell Fellowship. All awards are made upon the recommendation of the Polymer faculty.

### Psychology

The Covenant Scholarship is awarded when funds are available for outstanding performance in the graduate study of Industrial/Organizational Psychology. The scholarship is made possible through a gift from the Covenant Mutual Insurance Company. Application is made through the Department of Psychology, Unit 1020, Storrs, Connecticut 06269-1020.

The Isabelle Liberman Scholarship Fund, established by friends and colleagues of the late Professor of educational psychology, provides an annual award given to a graduate student for outstanding research in the psychology of language.

### Public Administration

The Karl A. Bosworth Award and the Morton J. Tenzer, the Albert Ilg, and the Phi Alpha Alpha Fellowships are awarded to students in the Master of Public Administration Program. Recipients are selected by the M.P.A. Program from applications submitted by students in the program. For more information, contact the MPA Program Office at (860) 486-4518.

### Public Health

Awards for full-time students based on academic merit include a graduate fellowship in public health that provides a one-year stipend of about \$20,000 (with the possibility of renewal for a second year),

a waiver of tuition and fees, and comprehensive health insurance; and a small number of graduate assistantships.

### Real Estate

Information concerning each of the scholarships listed below is available from: The Center for Real Estate and Urban Economic Studies ("Real Estate Center"), School of Business Administration, Room 426, Unit 1041, Storrs, Connecticut 06269-1041.

Byrl N. Boyce Valuation Scholarship is given to a student who is interested in pursuing a career in real estate valuation and who has demonstrated potential for future academic and professional accomplishments. Students apply through the Real Estate Center in the spring semester.

The Building Owners and Managers Association of Southwestern Connecticut provides an award for an undergraduate or graduate student from Fairfield or New Haven County (Connecticut). Application is through the Real Estate Center not later than the beginning of the fall semester.

The Commercial Investment Real Estate Institute University Scholarship is a \$1,000 award given to a student who intends to pursue a career in commercial-investment real estate and who has a record of superior scholastic achievement. Students apply early in the fall semester through the Real Estate Center.

The Connecticut Association of Realtors offers an annual scholarship of \$1,000 to an outstanding student concentrating in real estate. The scholarship is administered by the Real Estate Center.

The James M. Demund/Dow & Condon Colliers International Scholarship is an award of at least \$500 given to a student who has demonstrated superior scholastic achievement and who is interested in a career in real estate. Application is made through the Real Estate Center.

The Harwood Memorial Real Estate Scholarship is a national award offered by the Real Estate Educators Association to students enrolled in an undergraduate or graduate program specializing in real estate. A grade point average in real estate course work of at least *B* or higher is required. This is a \$500 award. Application is made through

the Real Estate Center at the beginning of the fall semester.

The Institute of Real Estate Management Foundation provides a nationally-competitive award of \$2,500 for a graduate student interested in Real Estate Management. Students apply through the Real Estate Center early in the spring.

The William N. Kinnard, Jr./CREUES Alumni Scholarship is a \$500 award for students with a strong interest in a career in real estate, past academic achievements, and demonstrated potential for future academic and professional accomplishments. Application is made in the spring semester through the Real Estate Center.

The Stephen D. Messner/School of Business Administration Scholarship and Fund provide support for undergraduate and graduate students in the areas of real estate and finance. Application is made either through the Real Estate Center or the Head of the Finance Department. There is no application deadline.

The Society of Industrial and Office Realtors/Samuel F. Pierson Scholarship offers a number of awards given to students interested in careers in real estate, preferably sales. Application is made early in the fall semester through the Real Estate Center.

### Social Work

The Albert Brown, Jr. Scholarship Fund provides a major award to one or more students in the School of Social Work who undertake a field placement at the University Health Service on the Storrs campus. Field placement is determined by committee. Further information is available from the Director of the Student Mental Health Service at the Storrs campus, (860) 486-4705.

### Sociology

The Michael Dunphy Award is given annually to a graduate student with a strong interest in American government, society, history, or culture. Outstanding intellectual ability and financial need must be demonstrated. The Sociology Department shares this award with History and Political Science. The Department of Sociology will name the winner in 1997, 2000, etc. Students are nominated by the So-

ciology Graduate Admissions and Financial Aid Committee.

The Ronald L. Taylor Award of \$100 is given annually for the best graduate student paper in Sociology. Students are notified by course instructors to apply. The award is available during the spring semester.

### Statistics

Graduate student support is available in the form of teaching assistantships, research assistantships, lectureships, and graduate fellowships. Advanced students can apply for summer teaching and research support. Internships with Connecticut firms can often be arranged for graduate students who have completed one year of study. In all cases, application is to the department's director of graduate studies.



### Additional Sources of External Support

The Office for Sponsored Programs, located in the Whetten Graduate Center, supplements departmental efforts in locating external sources of support for doctoral dissertation research, as well as general graduate student support. The support offered is usually contingent on professional goals and/or personal qualifications. Most programs have fall deadlines with funding available for the next academic year.

Students are also encouraged to consult the **GrantsNet** searchable database at <<http://www.grantsnet.com/>> or Peterson's **Grants for Graduate Study**, a compilation of federal and nonfederal resources available at the Babbidge Library.

For further information, contact the Office for Sponsored Programs, Unit 1133, Storrs, Connecticut, 06269-1133.



# UNIVERSITY PROGRAMS & SERVICES

## Requests for Official University of Connecticut Transcripts

Students at Storrs and the regional campuses can request official transcripts of their academic records by writing to the University of Connecticut, Office of the Registrar, Unit 4077-T, Storrs, Connecticut 06269-4077. Requests can also be transmitted by FAX to the Registrar at (860) 486-4199. All requests should include full name, social security number, UConn ID (PeopleSoft empl ID) if known, dates of attendance, complete and accurate addresses of transcript recipients (including ZIP codes), and the requester's address and telephone number in the event that there is a problem with the request. Requests **must** be signed even if they are faxed.

Request forms can be completed at the Registrar's Office in the Wilbur Cross Building on the Storrs campus. These forms are also available at the regional campus registrars' offices for mailing or faxing to the University Registrar at Storrs.

Students can request that their transcripts be sent to themselves. Note, however, that such transcripts are stamped "issued to student in a sealed envelope" and the envelope bears a similar stamp and a facsimile signature. Students are cautioned that some recipients will not accept transcripts that have not been sent directly to them.

Transcripts are sent out **only** by U.S. Postal Service first class mail, Priority Mail, or Express Mail. For Priority or Express Mail, the request must be accompanied by a pre-paid and pre-addressed Priority or Express Mail envelope. Alternate carriers (e.g. UPS, Federal Express) are not an option.

There are other restrictions to this service. Official transcripts may be withheld by appropriate University officials if some financial or other obligation to the University remains unmet. Since official transcripts are issued on security bank paper they **cannot be sent by FAX**. Requests are processed in the order in which they are received in one to five business days. The University does not honor telephone or e-mail requests for transcripts.

There is no service fee for official transcripts.

Students can obtain an unofficial transcript by presenting a photo I.D. in person at the Registrar's Office at Storrs or at any of the regional campuses; however, students should call the regional campus registrar in advance to make arrangements for transcript pickup.

## Housing

The Graduate Residences consist of three buildings in a coeducational complex which contains 440 carpeted single rooms. The residences are open year-round, including the recess periods. The complex is conveniently located in the center of

campus, allowing for easy access to the Graduate Center, the library, and academic facilities. The physical layout of the complex encourages a quiet, studious atmosphere.

Students desiring rooms in University housing facilities should send in the Application for On-Campus Housing and furnish deposits promptly when required. (See "Fees and Expenses.") Rooms in the Graduate Residences will be assigned on a priority basis within the limits of available space (some older undergraduates also may reside in the Graduate Residences). Hilltop Apartments also will be available to graduate students. See the website noted below for additional information.

International students and others who are not familiar with the region should realize that Storrs is located in a rural area about ten miles from the nearest city. There is limited public transportation. Hence, those coming from a considerable distance usually are well advised to seek housing on campus, at least for the first year of residence. Early application for a room is advisable because there always are more applications filed than rooms available in the Fall semester.

Students who are interested in off-campus housing are advised to come to the area with a car to search for housing. It may take as long as a week to find accommodations. Off-campus housing also fills up quickly, so students should seek and secure housing a few months before the semester begins. See the website noted below for additional information about off-campus housing.

International students, who do not have on-campus housing arrangements, should have confirmed off-campus housing arrangements prior to arrival on campus. Off-campus housing, within walking distance, is especially limited due to the rural location of the campus. Owning a car provides additional access to housing in nearby towns.

Prior arrangements for off-campus housing are essential and should be secured through assistance from the academic department.

Students may access the Department of Residential Life home page at <<http://www.reslife.uconn.edu>>. E-mail can be sent from the website.

## Health Services

The Department of Health Services, located in the Hilda M. Williams Building on Glenbrook Road, Storrs, provides primary level health care (medical and mental health). The Department of Health Services is a fully accredited ambulatory health care facility. Students are offered both in- and out-patient services. Health care treatment for non-life-threatening conditions is available. Because of certain limitations, some medical or psychological problems may be referred to the private sector for diagnosis and/or treatment.

In- and out-patient medical services are provided by the department. These services include outpatient nurse practitioner service, outpatient gynecological service, and outpatient mental health service. Supportive services include laboratory, x-ray, pharmacy, and physical therapy. Nutritional counseling also is available on an appointment basis. Health promotion and outreach

programs are offered through the Health Education Office and the Substance Abuse Education Program (HEART). Confidential HIV testing also is available.

The Department of Health Services is open continuously (24 hours a day) from 8:00 A.M. Monday through 4:00 P.M. on Saturday. Hours on Sunday are 8:00 A.M. to 4:00 P.M. There is an on-call telephone advice nurse service on Saturday and Sunday nights. There is reduced coverage during the semester breaks and the summer sessions. Services are available through appointment clinics and through daily walk-in clinics. The Women's Health Clinic specializes in all aspects of female sexuality and health care. The Women's Clinic also sponsors assault crisis intervention for sexual and physical abuse. Certain supportive services may be restricted when the University is not in full session.

Students who enter the University for the first time must furnish a detailed health history form for medical records purposes as well as documentary proof of adequate immunization against Measles and Rubella prior to registering for classes. Additionally, students must provide evidence of TB testing and appropriate medical intervention. All medical records are held in strict confidence and can be released only with a signed consent form.

Services are available to all properly registered Storrs students who present the required validated student identification card. Most primary care services are prepaid by the general University fee. There are additional charges for services including lab tests, x-rays, physical therapy, certain special procedures, annual gynecological exams, and prescriptions. These charges may be placed on the student's university fee bill. Such bills may be submitted to insurance companies for reimbursement, but remain the financial responsibility of the student. The Health Service is a participating provider with several major insurance plans. All full-time students must provide for their own accident and illness insurance to cover medical care not provided through the Department of Health Services. Students may opt to be covered for accidents and illnesses through a personal insurance policy, a parental insurance policy, or a group policy sponsored by the University. Supplemental Student Health Insurance for accident and sickness is available from a private student medical insurance program. Students who fail to provide proof of health insurance by filing an insurance waiver card may be charged and automatically enrolled in the university sponsored plan. Insurance information and enrollment for the student insurance program is available at the Department of Health Services.

## Dean of Students -- Office of Special Programs

Graduate students may use the services of the Office of Special Programs if they need professional assistance in resolving questions that concern them – their productivity, changing interests, study skills, substance abuse prevention, wellness, and issues



related to adjustment and transition. These services supplement counseling provided by the Health Service and by faculty advisors. The Office is located in the Wilbur Cross Building, Garden Level, Room 029. The telephone number is (860) 486-4130. Hours are Monday through Friday, 8:00 A.M. to 5:00 P.M. You may link to our website from <[www.uconn.edu](http://www.uconn.edu)>.

### Center for Students with Disabilities

A complete statement of the University's policies and procedures regarding students with disabilities can be accessed at this website: <[www.csd.uconn.edu](http://www.csd.uconn.edu)>.

The Center for Students with Disabilities (CSD) provides services to all students with permanent or temporary disabilities to ensure that all university programs are accessible. Our goal is ensure a comprehensively accessible university experience where individuals with disabilities have the same access to programs, opportunities, and activities as all others have.

Services offered include:

- Pre-admission counseling and new student orientation.
- Individualized academic accommodations and counseling.
- Residential accommodations and counseling.
- Financial aid counseling.
- Personal assistant training and referral.
- Assistive technology training.
- Transportation and parking services.
- Referral and liaison services to other agencies.
- Information and referral source to all University and community programs and services.

For more information, contact Donna M. Korbel, Director, CSD, Wilbur Cross Building, Unit 4174, Storrs, Connecticut 06269-4174; Voice (860) 486-2020, TDD (860) 486-2077, FAX (860) 486-4412.

**Students with Specific Learning Disabilities.** Through the University of Connecticut's Program for College Students with Learning Disabilities (UPLD), students with learning disabilities may receive support services including direct instruction in learning strategies and assistance in arranging appropriate accommodations. To access services, students must refer themselves to UPLD and provide documentation that meets the university's Guidelines for Documentation of a Specific Learning Disability. For information about services, students may contact Dr. Joseph W. Madaus, Director, University Program for College Students with Learning Disabilities, University of Connecticut, Neag School of Education, 362 Fairfield Road, Unit 2064, Storrs, Connecticut 06269-2064, (860) 486-0178, website <<http://www.cped.uconn.edu>>. Documentation should be current and comprehensive, and clearly indicate a specific learning disability based upon actual test scores and other pertinent data.

### Career Services

The needs of graduate students as soon-to-be professionals are unique. Career Services offers a number of services designed to assist graduate students in achieving their professional goals and addressing specialized needs. Appointments can be arranged by calling (860) 486-3013, or by visiting the office at 181 Auditorium Road (behind Health Services) for a consultation. Listed below are several of the services available to graduate students:

*Career Consultants* - Assistance is offered in clarifying career goals, putting together a resume, conducting a job search, and effective interviewing.

*Resume and CV Assistance* - Help is offered in creating targeted, effective resumes appropriate for individuals at the graduate level. If a student's career goals lie in academia, Career Services can assist in the development of a curriculum vitae (CV).

*Career Resource Library* - The CRL houses many resources of interest to graduate students, including occupational information, job search directories, books on resume and CV writing, international resources, and employer information.

*Mock Interviews* - These practice interviews, provided by our student paraprofessional Career Resource Assistants (CRA's), are videotaped and critiqued to provide an opportunity for the student to view his or her performance.

*Graduate Student Workshops* - Career Services representatives are available to speak to student organizations and academic departments regarding job searches and professional career development. Workshops can be arranged by contacting the Department.

### Graduate Student Senate

The Graduate Student Senate (GSS) was founded in 1966 for the purpose of enriching the lives of graduate students and acting on behalf of their needs and interests. Composed of students who represent all graduate fields of study, the GSS serves as the liaison between graduate students and the university administration and non-university organizations.

The GSS is recognized as one of the five deliberative bodies on campus (the others are the University's Board of Trustees, the University Senate, the Graduate Faculty Council, and the Undergraduate Student Government). The GSS has voting representatives on some of these bodies as well as other university standing committees.

The GSS engages in student advocacy, service, academic, and social activities. Areas of student advocacy in recent years have included:

- waiver of the general University fee for graduate students not taking courses who are pursuing research, etc. at locations distant from the university;
- cost-of-living adjustment for graduate assistant stipends;

- earlier issuance of initial graduate assistant pay checks;
- increased graduate student residential options; and
- adoption of new guidelines concerning duration and level of support for graduate assistants.

Examples of recent service involvements include:

- GSS short-term emergency loans for graduate students;
- annual publication of the *Graduate Student Handbook* and *Newsletter*;
- grants to departments and groups planning programs which contribute to the academic and professional development of graduate students; and
- dissemination of information to graduate students concerning university initiatives and policy changes.
- the Graduate Resource Fair, an annual orientation and resources fair for new graduate students.
- representation on University-wide committees such as the Vice Chancellor's Leadership Committee, University Senate, the Graduate Faculty Council, and the Chancellor's Library Advisory Committee.

Recent academic and social activities have included:

- coordination and sponsorship of *All That Jazz*, a multidisciplinary academic conference
- cosponsorship of the Irish Studies Conference
- lunches with key university administrators.
- co-sponsorship of the Society for Ethnobiology conference.
- social events such as a weekly coffee night, pasta dinners, and parties.

Programs and activities such as those listed above are funded largely by the Graduate Student Activities Fee with additional program support provided by the Graduate School. The GSS encourages all graduate students to participate in campus as well as university and student governance activities. Additional information concerning GSS programs and meetings is available from the GSS office, room 318 in the Whetten Graduate Center [*phone* (860) 486-3907, *e-mail* <[gss@huskymail.uconn.edu](mailto:gss@huskymail.uconn.edu)>, *Web* <<http://www.grad.uconn.edu/~wwwgss>>].

### Transportation

**Parking of Student Cars.** Parking on campus is in high demand and it is suggested that students who can avoid bringing a vehicle to campus should do so. The number of parking spaces available makes it impossible to give all students permission to register motor vehicles at the University. It is therefore necessary to establish guidelines for the allotment of motor vehicle permits. Those guidelines are as follows:

- Commuter students may purchase parking, regardless of semester standing.
- Resident students living on campus must have successfully completed 54 or more credits to be eligible for parking.

Qualified individuals are required to register their vehicles with Parking Services, pay a registration fee, and to display their valid permit. Photo identification or a valid UConn I.D. must be presented when purchasing a permit.

In order to purchase a parking permit, the applicant and the vehicle to be registered must meet all legal requirements for operation within the State of Connecticut. The vehicle must be owned (or operated) by the applicant or a member of his/her immediate family and must carry insurance or other form of security as established under Connecticut Motor Vehicle Laws (Title 14). Students may not register vehicles belonging to other students. Applicants must provide proof of vehicle registration when registering and all outstanding University fee bill charges must be paid prior to obtaining a parking permit.

Further information about parking on the Storrs campus can be obtained by calling Parking Services at (860) 486-4930, by visiting the website at <http://www.park.uconn.edu>, or by stopping by the Parking Services Office at 3 North Hillside Road on the Storrs Campus.

**Bus Service.** The University offers an extensive, no-fare shuttle bus service on the Storrs campus when classes are in session. A copy of the shuttle bus routes and hours of operation can be obtained from the Transportation Office by calling (860) 486-1448, by visiting the website at <http://www.park.uconn.edu>. Copies are also available from the Student Union, the UConn Co-op, or from the Transportation Office at 3 North Hillside Road on the Storrs Campus.

The Windham Regional Transit District (WRTD) provides bus service which operates between Storrs and Willimantic (a nearby city). Information regarding the route and hours of operation can be obtained by calling WRTD at (860) 486-2223. Connections to out-of-town buses can be made in Willimantic.



## OFFICE OF INTERNATIONAL AFFAIRS

The Office of International Affairs (OIA) and the Area Studies Programs are located in the Human Development Center/International Affairs Building (843 Bolton Road). Other units of the OIA include the Department of International Services and Programs,

which is responsible for advisory and program services for international students and faculty (450 Whitney Road Extension), and the UConn American English Language Institute (UCAELI), which offers a full-service English language program and is located in the Human Development Center/International Affairs Building.

The activities of the Office of International Affairs also include technical assistance and training projects (especially in developing countries), international exchange of faculty, coordination of research, and assistance with grant proposals.

The Center for European Studies encourages interdisciplinary study and research on Europe. The Center for Latin American and Caribbean Studies coordinates both undergraduate and graduate study of Latin America. The Center for Contemporary African Studies coordinates the development of programs and exchanges with African institutions and scholars.

## International Center -- Department of International Services and Programs

The International Center (Department of International Services and Programs) is located in Alsop B, West Campus, Unit 1083, 450 Whitney Road Extension, (860) 486-3855.

The International Center seeks to establish friendship and understanding among people of diverse cultures and backgrounds, while also providing an array of services to the international community.

The Center's facilities, which include a television lounge and game room, provide a focal point for a wide variety of intercultural programming. The Center is open every day and evening for use by individuals and student groups.

**International Advisory Services** – In addition to program activities, the International Center is responsible for the daily advisory services and program interests of international students, faculty, and staff. Full-time advisory staff are available to consult for the following:

- U.S. immigration concerns
- Personal, cultural, and academic adjustment
- Orientation and cross-cultural programming
- Special events for the campus community.

The Center provides an ideal meeting place for U.S. and international students. All are encouraged to visit. Weekly Coffee Hours are held.

## UConn American English Language Institute (UCAELI)

UCAELI offers a full service intensive English program for students of English as a second language. Courses are designed to prepare students for academic work and professional pursuits. Sixteen-week sessions are offered each fall and spring and two six-week sessions are offered in the summer. A TOEFL preparation course is offered each session as is the Institutional TOEFL exam. An English Proficiency Certificate, accepted by the Admissions Office in lieu of the TOEFL score, can be issued to qualified students. The majority of students in the program study full-time (23 hours per week); however, individual courses also are open to UConn degree-seeking students. Tutoring and customized courses also can be arranged. During the Fall and Spring sessions, students may enter or depart at the middle of the session.

## International Proposal Development/ Fulbright Program Advisement

The Coordinator of International Proposal Development seeks sources for funding for proposals to enhance area studies programs and internationalize the curriculum, and assists faculty, staff, and students in developing internationally-oriented grant and contract proposals.

The Fulbright Program Advisor publicizes and recruits applicants for Fulbright Scholarships and Fellowships and Fulbright-Hays Training Grants. Applicants are assisted in preparing competitive applications. The Fulbright Program Advisor chairs the University's Fulbright Scholarship Committee, a standing committee of the University.

# REGISTRATION

Applicants admitted on the basis of an expected baccalaureate or graduate degree must have completed all requirements for that degree prior to the start of classes. University of Connecticut seniors must have completed the baccalaureate prior to the start of classes. Otherwise they must continue to register as undergraduates, even though admitted to the Graduate School and registering for graduate courses.

Occasionally, a University of Connecticut senior planning to enter the Graduate School has less than a full course load remaining to complete for graduation. Such a student may take advanced courses along with the remaining undergraduate courses and may count those advanced courses toward the graduate degree. Inclusion of up to six credits of such course work is permissible under the following conditions: (a) the work is completed with grades of B or above; (b) the student is later admitted to Regular status in the Graduate School; (c) the work is approved as part of the graduate plan of study; and (d) the student presents a written statement from the University Registrar certifying that the work was not counted toward the baccalaureate degree.

Advance registration and fee payments are accepted on the assumption that students will remain eligible to continue, having met the scholastic standards of the Graduate School and by having complied with its regulations.

The following instructions apply to students registering for most courses conducted on the Storrs campus. Information on registering for courses offered through the College of Continuing Studies, courses offered by the School of Social Work, or courses offered by the Master of Business Administration programs conducted at centers other than Storrs will be found in brochures published by those programs. All degree-seeking students must register for courses using one of the available methods of registration, and pay all fees at the Office of the University Bursar. All course charges (applicable tuition and fees) are due and payable by the close of business on the tenth day of the semester. Late fees and the reinstatement fee are assessed after that time. Part-time students who are not degree-seeking students must register through the Office of Credit Programs in the College of Continuing Studies.

Both new and continuing students should make appointments with their major advisors to determine the courses in which they plan to enroll. Instructions for registration are sent to all students by mail. Entering students receive it with their admission information, while continuing students receive it about a month prior to the registration period. The material is mailed to the student's last known address on file in the Graduate School. If a student fails to receive this material, replacement copies may be obtained either from the Graduate

School website ([www.grad.uconn.edu/registration.html](http://www.grad.uconn.edu/registration.html)) or through the Graduate Records Office, Unit 1006, Storrs, Connecticut 06269-1006. Early registration will avoid confusion and increase the likelihood of obtaining the desired course(s). Ordinarily, there are two advance registration periods for the fall semester, one beginning in early April and the other beginning in mid-August. Similar periods for spring occur in late October and early January. The exact dates are contained in the registration mailing. Depending upon course selections, most students should be able to register entirely over the World Wide Web. Problems encountered during registration (including enrollment in restricted courses) may be brought to the Graduate School in the Whetten Graduate Center. In all cases, registration is not complete until all tuition and fees are paid at the Office of the University Bursar *or* a limited deferment of payment is obtained from the Deferment Office. In any event, both final registration for courses and final payment of fees (or issuance of a deferment) must be completed on or before the tenth business day of the semester. Failure to complete timely registration and payment of fees will subject the student in addition to the imposition of the Late Registration/Payment Fee and the Reinstatement Fee, as appropriate.

## Continuous Registration

Master's degree students, having started their degree programs, are required to register for and complete at least one appropriate course for credit within each twelve-month period, unless they have taken all course work on an approved master's plan of study and are reading for a master's final examination or preparing a thesis. Any master's degree student with course work remaining on the plan of study, who fails to complete any course work for credit in a twelve-month period, is subject to severance from his or her degree program. To be reinstated, the student must apply for readmission, with no certainty of being accepted.

All degree students must begin their programs with course work for credit and must maintain registration continuously each semester thereafter (except summer sessions) until all requirements for the degree have been completed. Registration may be maintained either by taking course work for credit or by registering for one of the four non-credit Continuing Registration courses. These include Special Readings at the master's (GRAD 398) or doctoral (GRAD 498) level, Master's Thesis Preparation (GRAD 399), and Doctoral Dissertation Preparation (GRAD 499). Other zero-credit courses may be substituted, if appropriate. Non-credit registration requires payment of the Graduate Matriculation Fee as well as the appropriate level of the General University Fee (see "General University Fee," "Graduate Matriculation Fee," and "Continuous Registration" under "Fees and Expenses"). Failure to maintain continuous registration during any semester results in the student's inactivation. Reinstatement is possible only after payment of all fees in arrears and the reinstatement fee. (See "Reinstatement Fee.") The consequences associated with

matriculation via Continuing Registration rather than credit courses are addressed in the "Course Loads" section.

Neither enrollment for Continuing Registration nor payment for it is required for any semester, during the first ten class days of which the student completes all requirements for a degree, if it is the only degree the student is pursuing.

Any currently matriculated student taking course work at another institution, either for transfer to a University of Connecticut graduate degree program or for any other reason, must register for Continuing Registration as specified above in any affected semester.

Enrollment in Continuing Registration is not required during the summer except as follows. A degree student, if not otherwise registered for the summer, must register for Continuing Registration and pay the Graduate Matriculation Fee if the student is fulfilling in part the doctoral residence requirement during the summer. To receive most forms of summer financial aid for study or research, a student must register for either 5 credits of coursework in each of two summer sessions or one of the full-time research courses, GRAD 396 (Full-time Master's Research) or GRAD 496 (Full-time Doctoral Research). Registration during the summer is done through the College of Continuing Studies.

## Registration Deadlines

All graduate students registering with the University must have their initial registration in place no later than the close of business of the tenth day of classes each semester. Additions to and deletions from a student's class schedule may occur freely throughout the first ten business days of the term. Students who do not complete an initial registration by the close of business of the first day of classes are subject to a late registration fee and a reinstatement fee.

## Course Loads

The number of credits and choice of courses for which a student registers is a matter to be discussed by the student and the major advisor. A student may be classified as a full-time student in one of three ways: (1) enroll in 9 or more credits of course work; (2) enroll in 6 or more credits of course work while holding a graduate assistantship (50% or greater); or (3) enroll in one of the four special purpose 3-credit courses. These courses include GRAD 396 (Full-time Master's Research), GRAD 496 (Full-time Doctoral Research), GRAD 397 (Master's Level Directed Studies), and GRAD 497 (Doctoral Level Directed Studies). The former two courses may be taken by students who have completed all requirements for the respective degree except the research component and who have no other obligations at the University (i.e., no other course work and no graduate assistantship). The latter two courses denote a full-time off-campus directed project, such as an internship, field work, or other special activity. Students in GRAD 397 or GRAD 497 may hold graduate assistantships if those assistantships are in direct support of their



studies. Such an assistantship may not be a standard teaching assistantship.

To be classified as half-time, the student's course credit load must be between 5 and 8 credits/semester. A credit load of fewer than 5 credits/semester is a part-time load. These criteria apply to all registered students at the University. The currently defined Continuing Registration courses (GRAD 398, 399, 498, and 499) are zero-credit "placeholder" courses denoting part-time study and do not count toward the credit load requirement for half-time or full-time enrollment status. Degree-seeking students who do not need to be certified by the University as holding at least half-time enrollment status may use these courses to maintain registration on a part-time basis.

Students holding graduate assistantships must register for 6 or more credits/semester. Such students are considered to be full-time students.

In addition to courses offered by each department, a student's credit load may include GRAD 395 (Thesis Research), GRAD 495 (Dissertation Research), and other equivalent research courses defined by the Graduate School, including seminar and other "colloquium" courses that are not part of the plan of study. These variable credit courses carry S/U grading, with the student's major advisor as the instructor of record.

No full-time member of the professional staff or faculty may take for credit academic work at this institution or elsewhere which conflicts with the staff or faculty member's assigned working hours. To take courses at all, staff and faculty members must have the approval of their department head and dean. (See "Admission," for regulations affecting staff or faculty members holding tenure or rank above instructor.)

### Auditing Courses

Students who do not wish to register for credit may be permitted to register as auditors under the following conditions: (1) they pay the appropriate tuition and fees for courses; (2) they obtain the consent of the instructor; (3) they audit only courses for which there are adequate classroom or laboratory facilities; and (4) in the case of students in degree programs, they obtain consent from their major advisors. All permissions and registrations for auditing courses must be filed in the Office of the University Registrar. Courses audited are entered on the student's permanent record, but such courses cannot be used toward fulfilling requirements for a graduate degree at the University.

The privileges of an auditor in a course are limited specifically to attending and listening. The auditor assumes no obligation to do any of the work required of the course and is not expected to take any of the instructor's time. In addition, the auditor does not submit any work, and is neither eligible to take any tests or examinations nor able to receive grades on all or any part of the course.

### Adding a Course

After the beginning of a semester or summer session, a student may not add a course if the instructor feels that elapsed time might preclude

its successful completion. For degree-seeking students, courses added after the tenth day of a semester or after the fifth day of a summer-session term must be submitted to the Graduate Records Office. Changing a course from an audit to credit-based after this time must be done at the Graduate Records Office. Certain exceptions to this policy exist. Students in the Sixth-Year Program must obtain permission from the Associate Dean of the School of Education. Students in part-time M.B.A. programs conducted at locations other than Storrs must obtain permission from the director of the program at their location. Students in Social Work must follow the procedures in effect at the School of Social Work.

### Dropping a Course

Discontinuance of attendance or notice to an instructor or to an advisor does not constitute cancellation of course registration, and may result in a failing grade on the student's permanent record. Before terminating class attendance, the student should ensure that the course has been dropped officially. Until this has been done, the student is obligated to complete all work. No grade is recorded for courses officially dropped, but a mark of *W* is recorded to signify withdrawal from a course after the tenth day of the semester or after the first week of a summer-session course. Cancellation of course registration does not automatically drop a course from a plan of study, nor does approved deletion of a course from a plan of study cause cancellation of course registration. The procedures are separate and unrelated.

**During the first nine weeks of a semester or prior to the midpoint of a summer-session course**, a course may be dropped by the following procedure. Students registered directly by the Graduate School at Storrs (or during the summer sessions, through the College of Continuing Studies) must file properly completed and signed schedule revision request card with the Graduate School. Non-degree students registered during either semester through the College of Continuing Studies must notify that office in writing. Students in part-time M.B.A. programs conducted at locations other than Storrs must notify the director of the program in writing. Students in Social Work must follow procedures in force at the School of Social Work.

**After the first nine weeks of a semester or the midpoint of a summer-session course**, students ordinarily are not allowed to drop a course or to change from participant to auditor. If, however, a student must drop a course because of illness or other compelling reason beyond the student's control, the student must request special permission as early as possible and well before the last day of classes. Permission to drop a course or to change from participant to auditor is granted only for good cause. All students – except those in the Sixth-Year Program, part-time M.B.A. programs conducted at locations other than Storrs, or the Social Work program – whether enrolled in daytime or evening classes, at Storrs or elsewhere, must obtain permission from the Graduate School. Permission is granted only on the major advisor's written

recommendation, which must be convincing and sufficiently specific regarding reasons beyond the control of the student. The recommendation should be accompanied by properly completed and signed schedule revision request card for the course(s) to be dropped. Students in the Sixth-Year Program must obtain permission from the Associate Dean of the School of Education. Students in part-time M.B.A. programs conducted at locations other than Storrs must obtain permission from the director of the program. Students in Social Work must follow procedures in force at the School of Social Work. Under no circumstances is a student at any location or in any program permitted to drop a course after the course has officially ended.

### Dropping all Courses; Withdrawal from the Program

The general policies and procedures regarding dropping a course (above) apply to dropping all courses, whether the student wishes to remain active in the graduate degree program or to withdraw permanently from it. Permission from the Graduate School is needed for the student either to remain active in the program or to leave in good standing. If a student wishes to remain active and registered after dropping all courses, an appropriate zero-credit Continuing Registration course must be added to his or her enrollment record. The determination of active status is subject to the provisions contained in the "Continuous Registration" section.

If a refund is due to a student (See "Refunds and Cancellations of Charges"), the schedule-revision-request card must be signed by the appropriate Graduate School officer, regardless of the week of the semester. This signature is required so that the refund process may be initiated. No refund is possible unless all course work for credit is dropped.

# STANDARDS & DEGREE REQUIREMENTS

These represent general academic standards and requirements of the Graduate School as they apply to graduate students in degree programs. Some programs have special regulations more detailed or stringent. Students should acquaint themselves with their own program's requirements as set forth in this Catalog and subsequent ones, as appropriate. Undergraduate and non-degree students taking a graduate course should consult the appropriate bulletin for regulations which apply to them.

## Course Grades

Instructors are required to file with the University Registrar grades for all courses that a student takes for credit. While instructors are free to set the standard of performance they expect in their courses, a uniform scale is published to encourage general agreement on the meaning of grades.

The letter *A* signifies work of distinction. The letter *B* represents work of good quality, such as is expected of any successful graduate student. The letter *C* represents work below the standard expected of graduate students in their area of study. It is recognized that work of *C* quality in a supporting area may be of benefit to students and that they should not be discouraged by the grading system from including some supporting work in their programs. Such work shall be identified on the plan of study. Plus and minus values may be assigned to all but failing grades, are entered on the permanent record, and are computed into the student's grade point average.

A grade of *D+*, *D*, or *D-* signifies work of unsatisfactory quality. If a graduate student receives any form of a *D* grade, the course may not remain on the plan of study and the student's eligibility to continue in the degree program is reviewed by the student's advisory committee.

The grade of *F* or *U* signifies failure in the course and necessitates a recommendation by the advisory committee to the Graduate School as to whether or not the student shall be permitted to continue graduate study.

Final grades of *S* (Satisfactory) or *U* (Unsatisfactory) are associated only with certain courses designated as such by the Executive Committee of the Graduate Faculty Council. Certain foreign language courses designed under method (2) for fulfillment of a doctoral language requirement also may carry the *S/U* grading option, if chosen by the student. (See "Foreign Language; Related or Supporting Area of Study.") All but the foreign language courses are identified in this bulletin by the symbol † preceding the course number. This type of grading is designed

for courses or sections of courses in which student performance cannot readily be evaluated due to the nature of the course as conducted at the time. An exception might occur for a student needing a letter grade for transfer to another institution. An *S* is not computed into the student's grade point average, while a *U* is counted as an *F* (except that no computation is made for 100's level courses).

Graduate students are not permitted to take any regular course, undergraduate or graduate, on a Pass/Fail basis.

A mark of *I* (Incomplete) is assigned if a student has been doing work of acceptable quality but, for some reason satisfactory to the instructor, has not completed all of the work required to earn credit for a course by the end of the semester or session.

The letter *W* signifies withdrawal from a course after either the tenth day of a semester course or the first week of a summer-session course. Except in extraordinary cases where academic factors or extreme or unusual circumstances warrant it, this mark is not deleted from the permanent academic record.

If a student whose work in a course throughout the semester has been of satisfactory quality fails to take a required final examination in the course because of illness or other serious cause, the instructor is permitted to give a mark of *X* (Absent) and may, with the permission of the Graduate School, reschedule the examination. If the student's work up to the time of the examination was not clearly of passing quality, the instructor is to enter a mark of *F* or *U* if a required final examination is missed.

The letters *L*, *N*, and *Y* are administrative symbols signifying that a letter grade had not been reported by the instructor when grades were processed. The letter *L* signifies lateness in reporting grades for an entire section of a course. The letter *N* signifies that no grade was reported for an individual student duly registered for a course. The letter *Y* signifies that no grades were due to be reported for an entire section of a course (because of the scheduling of the course) when grades were processed.

The letters *I* and *X* are never removed from the permanent record and transcripts.

The letter *T* indicates that course credit has been accepted in transfer from another institution.

The letter *R* is an administrative symbol signifying that a student is registered. Any zero-credit course (e.g., GRAD 398, 399, 498, or 499) for which a student registers appears on the permanent academic record with the letter *R* as the grade.

## Scholastic Standards

Students are expected to maintain in their course program at least a *B* (3.00) average, for which a grade point average will be computed on a scale where:

<i>A</i> + = 4.3	<i>B</i> - = 2.7	<i>D</i> + = 1.3
<i>A</i> = 4.0	<i>C</i> + = 2.3	<i>D</i> = 1.0
<i>A</i> - = 3.7	<i>C</i> = 2.0	<i>D</i> - = 0.7
<i>B</i> + = 3.3	<i>C</i> - = 1.7	<i>F</i> = 0
<i>B</i> = 3.0		

Maintenance of good academic standing in the Graduate School requires at all times a cumulative grade point average of 3.00 or higher in all completed 200's, 300's, and 400's level courses. An official transcript of an individual's graduate academic career, however, includes grade point average calculations based on all course work completed during the student's graduate career (including any 100's level courses). Credits completed elsewhere and accepted in transfer by the Graduate School do not affect the student's University of Connecticut grade point average in any way.

Whenever a student's cumulative average falls below 3.00, the program is reviewed by the student's advisory committee to determine whether or not the student shall be permitted to continue graduate study.

If all work required to change a mark of *I* or *X* is not submitted to the University Registrar within twelve months following the end of the semester or session for which the mark was recorded, or within a shorter period of time specifically designated by the instructor, no credit is allowed for the course, and the indicated *I* or *X* becomes a part of the permanent record. The instructor has the option of changing such a mark to a grade of *F* or *U* within thirteen months following the end of the original semester or session. For grades of *I*, it is the student's responsibility to reach and to maintain an understanding with the instructor concerning the timely completion of the work. For grades of *X*, it is the student's responsibility to seek the required permission to take the final examination from the Graduate School as soon as possible after it has been missed.

Upon the recommendation of the instructor to the Graduate School, a limited extension of an Incomplete may be granted. The Graduate School is not obligated to approve an extension if the instructor of the course no longer is a faculty member at the University of Connecticut.

If more than three courses have been left incomplete, the student may be required to complete those still viable before being allowed to register for additional course work. Too many permanent Incompletes on the record may be grounds for the student's termination or dismissal. An employment authorization for a graduate assistantship appointment may not be approved for a student who has four or more viable incomplete courses on his or her academic record.

For further information the reader is referred to the document, "Key to the Transcript," available from the Office of the University Registrar.

## Termination of Status

To remain in good standing, a student at all times must have a major advisor as well as a viable terminal date (the date by which all degree requirements must be completed). A viable terminal date may be the result of an extension of a student's expired original terminal date. Once the plan of study has been approved by the Executive Committee of the Graduate Faculty Council, a student at all times must have a duly constituted advisory committee with at least two associate advisors in addition to the major advisor.

In the event that a student's major advisor determines that resignation from the advisory committee is necessary, the student is provided with a reasonable opportunity to arrange for a new major advisor. If a new major advisor is not identified within six weeks of the resignation of the former major advisor, the student's graduate degree program status is terminated.

The Graduate School alerts both the major advisor and the student when a terminal date or terminal date extension has expired. In the event that the major advisor determines that he or she cannot support a recommendation to extend the terminal date further, the Graduate School must be notified in writing as soon as possible after the date of the notice of expiration. Extensions of the terminal date are granted by the Graduate School only on the basis of substantial evidence that the student is making consistent and satisfactory progress toward the completion of degree requirements. Written recommendation to extend the terminal date must be submitted in a timely manner by the major advisor to the Graduate School. In the absence of a timely recommendation to extend an expired terminal date, or in the event that a recommended extension has been denied by the Graduate School, the student's graduate degree program status is terminated.

Whenever a student's graduate degree program status is terminated, a letter is sent to the student by the Associate Dean. If the student wishes to request a hearing, the provisions outlined under "Hearing and Appeal Procedures" apply.

### Academic Dismissal

A graduate student's progress in a degree program is monitored regularly by the student's advisory committee. If at any time, a student's academic performance, progress in a graduate degree program, or professional development and/or suitability is judged by his or her advisory committee to be unsatisfactory, and if the advisory committee determines that dismissal on any of these grounds is warranted, the advisory committee must submit its written recommendation that the student be dismissed on such grounds to the Dean of the Graduate School. A student may be subject to academic dismissal if he or she: (1) fails to maintain the minimum cumulative grade point average required by the Graduate School (3.00); (2) receives a grade of *D+*, *D*, *D-*, *F*, or *U* in any course; (3) fails to satisfy a foreign language requirement for a degree; (4) fails the D.M.A. or Ph.D. general examination; (5) fails to produce an acceptable D.M.A. document or Ph.D. dissertation proposal; (6) performs unsatisfactorily in any aspect of the research or writing for a master's thesis or doctoral dissertation; (7) fails the final examination for the master's or doctoral degree; or (8) fails to satisfy any other academic requirement of the student's graduate degree program. The specific judgment on which the advisory committee's recommendation is based must be stated. The recommendation must bear the signature of each member of the advisory

committee. For a student whose advisory committee has not yet been established, the major advisor alone submits the recommendation. If the student is to be dismissed on any of the above grounds, a letter of dismissal is issued by the Associate Dean. If the student wishes to request a hearing, the provisions outlined below under "Hearing and Appeal Procedures" apply.

### Hearing and Appeal Procedures

If a student's graduate degree program status is to be terminated or if a student is to be dismissed on academic grounds, the Associate Dean issues a letter to the student stating this intent. If a student wishes to request a hearing before the Associate Dean, the student must submit a written request within 30 days of receipt of the letter. Following the hearing, the student may appeal the decision of the Associate Dean to the Dean. This appeal does not constitute a new hearing. Rather, it is a review of the record of the original hearing and is entertained only on one or both of two grounds: (1) the claim of an error in the hearing procedure, and (2) the claim of new evidence or information that was not available at the time of the hearing. If the student's termination or dismissal is upheld by the Dean, the student may appeal further to the Provost on only the same grounds as the appeal to the Dean. In any event, the decision of the Provost is final.

## GRADUATE CERTIFICATE PROGRAMS

Graduate certificate programs may be offered within the structure of the Graduate School. Students may be awarded these certificates upon completion of a well-defined program of course work. The graduate certificate is not defined as a degree by the Graduate School; rather, it is simply a focused collection of courses that, when completed, affords the student some record of coherent academic accomplishment in a given discipline or set of related disciplines. Moreover, the graduate certificate is not viewed as a guaranteed means of entry into a graduate degree program. While the courses comprising a graduate certificate may be used as evidence in support of a student's application for admission to a graduate degree program, the certificate itself is not considered to be a prerequisite. The didactic material contained within a graduate certificate program may represent a more practice-oriented subset of an existing graduate discipline. Detailed information concerning admissions criteria and procedures can be obtained from graduate certificate program coordinators.

An appropriate number of academic credits must comprise the certificate program. The number of graduate (300- or 400-level) credits may not be fewer than nine nor more than one-half of the credits necessary for a related Master's degree from the Graduate School. Ordinarily, the credit requirement ranges from 12 to 15 graduate semester credits. When there exists no related Master's program,

the number of credits required for a graduate certificate is limited to 12.

A certificate student may enroll on either a part-time or a full-time basis, as determined by the certificate program coordinator and the number of credits taken by the student. Students enrolled on a full-time basis have access to many of the same campus services as other full-time graduate students. They may live in on-campus graduate student housing and they may be granted student library access and campus parking privileges, among others. They also may be considered for merit-based financial aid by the department or program, as well as for need-based financial aid by the Student Financial Aid Office, but at a reduced priority compared to degree-seeking students.

## THE MASTER'S DEGREE

Master's degree programs are offered in nearly 70 fields of study in the Graduate School. The Master of Arts degree usually is awarded to properly qualified candidates in the humanities, the social sciences, education, and all non-scientific fields except art, business administration, public affairs, and social work. The Master of Science degree is awarded to candidates in the natural, physical, mathematical, pharmaceutical, nutritional, and agricultural sciences, as well as Accounting, Nursing; and Engineering. Other Master's degrees awarded are the Master of Business Administration, the Master of Dental Science, the Master of Engineering, the Master of Fine Arts, the Master of Music, the Master of Public Administration, the Master of Public Health, and the Master of Social Work. A master's degree program represents the equivalent of at least one year of full-time study beyond the baccalaureate (or its equivalent).

Since the Master's degree is the only intermediate degree offered by this University, it should be emphasized that the education it provides may prepare students for a variety of goals. The advisory committee should take into consideration the student's objectives and insist on the student's giving sufficient time to the program so that they may be fulfilled. Those students who are committed to doctoral study generally need less time to complete a Master's degree than those for whom the master's program provides the only opportunity to prepare for various professions. Recognizing the difference between a research degree and a terminal Master's degree, the committee should determine the student's goals and potential as early as possible, so as to help the student develop an appropriate predoctoral or terminal plan of study.

In most fields of study, work for the Master's degree is offered mostly, if not exclusively, on the main campus at Storrs. There are some exceptions. The Master of Business Administration is offered on a part-time basis at the West Hartford and Stamford campuses and on a full-time basis at the Storrs campus. The Master of Dental Science program and the Master of Public Health program



are offered primarily at the Health Center in Farmington. The Master of Social Work program is offered at the West Hartford campus. Certain courses in education, engineering, geological sciences, and oceanography are offered at locations other than Storrs. With the exception of the programs listed above, at least nine credits at the graduate level must be earned on the Storrs campus.

### Time Limits

The student is expected to register for course work with reasonable regularity and to complete all requirements for the degree within a moderate span of time to assure continuity and adequate familiarity with developments in the field of study. (See "Continuous Registration.") Ordinarily, the Master's degree should be completed within two years or so. In any event, all work for the Master's degree must be completed within a maximum period of six years from the beginning of the earliest course, wherever taken, listed on the approved plan of study. Failure to complete the work within this period or failure to maintain continuous registration (see "Continuous Registration") will require re-evaluation of the student's entire program and may result in termination.

An extension of a student's terminal date is considered only when there is substantial evidence that the student has attempted to make regular and consistent progress toward completion of degree requirements. A written recommendation to extend the terminal date must bear the signature of the student's major advisor, and it must be submitted in a timely manner to the Graduate School. Approval is granted by the Dean. Each subsequent request to extend a student's terminal date requires greater justification and more extraordinary circumstances. Third requests for extension are rarely, if ever, granted.

### Plan A and Plan B Master's Degrees

Master's degrees may be earned under either of two plans, as determined by the advisory committee. The first plan (Plan A) emphasizes research, while the second (Plan B) requires comprehensive understanding of a more general character. Plan A requires not fewer than fifteen credits of advanced course work and for students entering Fall 1998 or later, nine credits of Master's Thesis Research (GRAD 395 or GRAD 396), as well as the writing of a thesis. Plan B requires not fewer than twenty-four credits of advanced course work, a final examination, but no thesis. In either case, advisory committees may require more than the minimum number of credits.

Up to six credits of advanced course work taken on a non-degree basis at the University of Connecticut may be included on a Master's degree plan of study provided the following conditions are met: (1) the grades earned in such course work are *B* (not *B-*) or higher; (2) such course work is within the six-year limit for completion of Master's degree requirements; and (3) such credits have not been applied toward any other degree, here or elsewhere (already completed or to be completed in

the future). In any event, inclusion of non-degree course work on the plan of study requires the consent of the advisory committee and is subject to the approval of the Executive Committee.

Up to six credits of advanced course work completed or to be completed at other institutions may be approved for transfer to the student's Master's degree program at the University of Connecticut. Such credits are to be listed "below the line" on the plan of study. The following conditions must be met before final approval of any transfer of credit is granted: (1) the advisory committee must indicate its approval of the transfer of credit by signing the plan of study; (2) the courses must be at a level appropriate for a graduate degree and offered by an accredited institution; and (3) the grades earned in any courses to be transferred must be *B* (not *B-*) or higher. Official transcripts of any course work to be transferred must be on file in the Graduate School. When the student's plan of study has gained the approval of the Executive Committee and official transcripts indicating satisfactory completion of the course work to be transferred are received, the transfer of credit is noted on the student's permanent academic record. Any credits transferred to a graduate degree program at the University of Connecticut must not have been used toward a degree elsewhere (already completed or to be completed in the future).

Students admitted to study for the degree of Doctor of Philosophy may earn a Master's degree, if one is offered specifically in their field, under either Plan A or Plan B. They also may apply for this degree if they have on file a fully approved doctoral plan of study including at least twenty-four completed credits of suitable course work taken at this University and have passed a master's final examination. They also may apply for this degree if they have completed at least 24 credits on an approved Ph.D. plan of study, have passed the doctoral general examination, and have been recommended by their major advisor or by the Dean of the Graduate School for award of the Master's degree.

More than one Master's degree may not be awarded at this institution to an individual student unless the degree titles are different or unless the degrees are earned in different fields of study. The same course may not be offered for credit toward more than one degree, except in the case of officially approved dual degree programs.

### Candidacy and Plan of Study

To become a candidate for a Master's degree, the student must have on file with the Graduate School a plan of study prepared with the aid and approval of an advisory committee and approved by the Executive Committee of the Graduate Faculty Council. To be eligible for degree conferral, a Master's degree student must have been granted Regular status. The student may not take the final examination for the degree before the plan of study has been fully approved. The plan of study must be prepared in triplicate, signed by the student and the members of the advisory committee, and

submitted to the Graduate School for approval by the Executive Committee when the student has completed not more than twelve credits of course work to be applied to the degree. Failure to present the plan on time may prolong the period of study for the degree. Before drawing up and approving the plan, the major advisor should have on file and should consult for guidance a set of transcripts of all undergraduate and graduate work the student has taken. The advisory committee may require that the student take an exploratory examination to guide the committee in formulating the plan of study.

Courses elected shall be consistent with the student's objectives and related to the field in which the degree will be taken. Plans of study shall consist largely of courses at the 300's level or above. A limited number of credits at the 200's level (not more than six), if not open to sophomores, may be accepted. In addition to the minimum number of course credits required for the degree, the advisory committee may require the student to take other courses with or without graduate credit, depending on the student's objectives and previous preparation. Course credit by examination is not allowed as a means of accumulating credits to meet the requirements for advanced degrees at this institution.

After approval of the plan by the Executive Committee, any request for change must be submitted to the Graduate School on the official form bearing the signatures of the advisory committee and the student for approval by the Executive Committee. Successful completion of all work indicated on the approved plan of study is a fundamental prerequisite to the conferral of the degree.

Once the plan of study is approved, the student and the advisory committee should reevaluate it regularly and modify it, following the established procedure, if appropriate.

### The Master's Thesis

The advisory committee must approve the topic and scope of the thesis required under Plan A and upon its completion, ascertain that it represents an independent investigation of a significant topic and is an important contribution to ongoing research in the candidate's field. The thesis must be acceptable in literary style and organization. The thesis is regarded as an important part of the student's program. Specifications for preparation of the thesis can be obtained at the Graduate School or from the Graduate School's website. It is the student's responsibility to be certain that the thesis conforms exactly to the specifications prescribed by the Graduate School.

No restrictions that limit or delay the accessibility, use, or distribution of the results of any student's research are acceptable, if such delays interfere with the timely completion of a student's academic program.

The thesis must be dated as of the calendar year in which all requirements for the degree are completed. Two high quality copies of the thesis

must be deposited in the Graduate School by the conferral period deadlines of August 31, December 31, or Commencement day in May. Each copy must contain an approval page bearing original signatures of all members of the advisory committee. At least 25% cotton-content bond paper of at least 20-pound weight must be used for both copies. After binding, both copies become the property of the Homer Babbidge Library, and the identical second copy is made available for faculty and student use. If the thesis is lengthy, the Babbidge Library may require that it be bound as more than one volume. If a program requires one or more extra copies, it is the student's responsibility to supply them directly to the program.

### Final Examination

Near the close of the candidate's period of study – not later than one year after the completion of course work or the thesis – the student must pass a final examination under the jurisdiction of the advisory committee. The student may not take the final examination before the plan of study has been approved by the Executive Committee or before Regular status has been granted. The advisory committee has discretion to determine whether the examination shall be written, oral, or both. Invitation to participate in an oral examination is issued by the advisory committee, although any and all members of the faculty may attend. The examination must be completed by the published deadlines for the appropriate conferral period for the degree to have that conferral date.

The decision as to whether a student has passed or failed the examination rests solely with the advisory committee, which shall take into account the opinions of other participating faculty members. The vote of the advisory committee must be unanimous. Immediately following the examination, the major advisor shall communicate the results to the student and send a report on the official form to the Graduate School. If the student has failed the examination or if the advisory committee considers the result of the examination inconclusive, the committee has the option of requiring the student to retake it. In such cases, the recommendation must reach the Graduate School promptly, and any re-examination must take place within twelve months from the date of the original examination.

Under Plan A the examination may center on the candidate's research and its relation to the field of study as a whole, but may have a wider scope. Under Plan B the examination shall be comprehensive and designed to assess the candidate's mastery of the field and ability to integrate the knowledge acquired. The Master's final examination often is used as a qualifying examination for doctoral study.

## THE DOCTOR OF MUSICAL ARTS DEGREE

The D.M.A. degree is the highest practice-oriented degree offered by the Graduate School in the field of Music. The program leading to its attainment is intended to give persons of outstanding ability the opportunity to become creative contributors in musical performance and scholarship. Award of the degree testifies to broad mastery of the art of music, an ability to practice that art on an exceptionally high level, and acquisition of appropriate research skills.

While certain minimum requirements are set by the Graduate School and the Music Department, it is important for students to realize that work toward this degree is not merely a matter of accumulating course credits or satisfying other requirements. The degree will be conferred only after the advisory committee and the Graduate Music Faculty are convinced that the student is able to demonstrate consummate artistry in a public forum, and has developed independence of judgment and mature scholarship.

### Time Limits

The equivalent of at least two years of full-time study beyond the Master's degree is required. All work must be completed within seven years of the beginning of doctoral study. The beginning of doctoral study is defined as the beginning date of the earliest course, wherever taken, listed on the approved doctoral plan of study. The general examination shall be passed within four years of the beginning of doctoral study. Failure to complete the work within the periods specified or failure to maintain continuous registration (See "Continuous Registration") will require re-evaluation of the entire program and may result in a notice of termination. A five-year time limit applies to the acceptance of foreign-language courses. (See "Foreign Language.")

An extension of a student's terminal date is considered only when there is substantial evidence that the student has attempted to make regular and consistent progress toward completion of degree requirements. A written recommendation to extend the terminal date must bear the signature of the student's major advisor, and it must be submitted in a timely manner to the Graduate School. Approval is granted by the Dean. Each subsequent request to extend a student's terminal date requires greater justification and more extraordinary circumstances. Third requests for extension are rarely, if ever, granted.

### Residence Requirement

A graduate student can fulfill the special demands of a doctoral program only by devoting a continuous period of time to concentrated study, practice, and research with a minimum of outside distraction or employment. The D.M.A. student must complete one year (two semesters) of full-time study in

residence. This residence period must be completed through registration for and completion of appropriate course loads or research at the Storrs campus. Students ordinarily must register for full-time student status during the residence period (*see* "Course Loads").

The principal criterion for full-time study as required for fulfillment of the doctoral residence requirement is whether the student is in fact devoting essentially full-time effort to studies, without undue distraction caused by outside employment. It is left to the advisory committee to determine whether a student's outside employment is a distraction that prevents the student from devoting essentially full-time effort to the planned program. The advisory committee will record this determination on the plan of study, along with a description of the nature, extent, and period(s) of outside employment during the residence period.

### Plan of Study

The plan of study must be prepared; signed by the student, the members of the advisory committee, and the Director of Graduate Studies in Music; and then submitted to the Graduate School for approval by the Executive Committee of the Graduate Faculty Council. The student may not take the general examination before the plan of study has been fully approved. Failure to present the plan on time may prolong the period of study for the degree. Before formulating and signing the plan, the major advisor should have transcripts of all of the student's undergraduate and graduate work on file and should consult them for guidance. The advisory committee may require that the student take an exploratory examination to guide the committee in formulating the plan of study.

A limited number of credits at the 200's level (not more than six), if not open to sophomores, may be accepted. The degree ordinarily requires at least 43 credits, depending on the area of concentration. The plan will designate any foreign language(s) in which the student is to be tested. Course credit by examination is not allowed as a means of accumulating credits to meet the requirements for advanced degrees at this institution. For students entering in Fall 1998 or later, at least fifteen credits of GRAD 495 must appear on the plan of study. This effort represents the research for the D.M.A. Dissertation, which is an essential component of the student's program.

Advanced course work taken on a non-degree basis at the University of Connecticut may be included on a D.M.A. plan of study provided the following conditions are met: (1) the grades earned in such course work are *B* (not *B-*) or higher, (2) such course work is within the seven year limit for completion of D.M.A. degree requirements, and (3) such credits have not been applied toward any other degree here or elsewhere (already completed or to be completed in the future). In any event, inclusion of non-degree course work on the plan of study requires the consent of the advisory committee and is subject to the approval of the Executive Committee.

After approval of the plan by the Executive Committee, any request for change must be submitted in advance to the Graduate School on an official form bearing the signatures of the members of the advisory committee and the student. Such changes are subject to approval by the Executive Committee. The successful completion of all work indicated on the approved plan of study is a fundamental prerequisite to conferral of the degree.

Once the plan of study is approved, the student and the advisory committee should reevaluate it regularly and modify it, following the established procedure, if appropriate.

### Foreign Language

Students in all areas of concentration except voice shall be required to have a competent reading knowledge of at least one foreign language appropriate to the general area of study. Students in voice must have a competent reading knowledge of at least two foreign languages appropriate to the general area of study.

Students should plan to meet the language requirement early in their graduate career and well before they begin preparation for the general examination. Methods for establishing evidence of reading competence are the same as those for the Ph.D. (See explanation of the Foreign Language requirement under "The Doctor of Philosophy Degree.")

### Transfer Credit

Transfer of credit for course work completed at other institutions is approved only after the student has demonstrated the ability to do acceptable graduate work at the University of Connecticut. Such ability must be demonstrated by successful completion of graduate level University of Connecticut course work. The maximum number of credits accepted from accredited institutions is six, provided it is of at least *B* (not *B-*) quality and contributes to the objectives of the proposed doctoral program. Such graduate work may be approved for transfer provided that the general examination is to be passed and all degree requirements are to be completed within the prescribed period – seven years – from the beginning date of the earliest course, wherever taken, listed on the approved doctoral plan of study. (See "Time Limits.") Transfer credit is not granted for individual courses used for a degree elsewhere (already completed or to be completed in the future). Instead, consideration is given to that degree program as an entity when the doctoral plan of study is being prepared.

### Evaluation of Performance

The advisory committee shall evaluate continually the student's performance. Any graduate student whose scholastic performance does not meet the minimum requirements of the Graduate School may be subject to dismissal. The first recital for all D.M.A. students, except for those in conducting, is considered to be a qualifying recital, and must be presented during the first year of D.M.A. study. This recital is evaluated by the student's advisory

committee. Any student who does not demonstrate an appropriate level of performance in this recital is subject to dismissal.

### General Examination

The general examination shall be taken near the end of the course program but not later than eight months prior to the conferral of the degree. Before arrangements for the examination are made, the foreign language requirement(s) should have been met and the plan of study must have been approved by the Executive Committee of the Graduate Faculty Council. The examination is comprehensive in nature, and incorporates elements of music history and literature, music theory, performance practice, and practical application of these constituent components.

The examination is under the jurisdiction of the student's advisory committee and contains both written and oral components. Not fewer than five faculty members, including all members of the advisory committee, constitute the examining committee and participate in the examination. The final decision as to whether or not the student has passed the examination is determined solely by majority vote of the examining committee.

After the examination, the major advisor communicates the results to the candidate and sends the official report on the examination to the Graduate School.

### D.M.A. Dissertation Proposal

Before preparation of the D.M.A. Dissertation is well under way, the student must file a proposal describing the intended research with the Graduate Studies Committee of the Music Department. Failure to file the proposal early may result in wasted effort on a document if changes are required in the project. The proposal must be approved by the Graduate Studies Committee in Music at least four months before the filing of the D.M.A. Dissertation and it must be approved by the Executive Committee of the Graduate Faculty Council at least three months before the filing of the D.M.A. Dissertation.

### Candidacy, Recitals, and D.M.A. Dissertation Preparation

Upon passing the general examination, the foreign language requirements, and (in the case of all students except conducting majors) the qualifying recital, the student becomes a candidate for the degree Doctor of Musical Arts. Students are notified of their advancement to candidacy.

Students in every D.M.A. area of concentration except conducting must present at least three full-length recitals during the course of study for the degree. The first of these is considered to be a qualifying recital. Each recital must be preceded by a juried pre-recital hearing. This hearing must be presented at least three weeks before the scheduled recital date and adjudicated by the advisory committee. These recitals and concerts represent the culmination of the performance aspect of this degree, and will be judged according to the highest levels of musical artistry. Majors in

conducting must appear in concert as conductors with the appropriate departmental major ensemble. Either two one-half concert appearances or one whole concert appearance is required. In addition, conducting majors must present one full-length recital during the course of study for the degree.

A written dissertation representing research into some aspect of music performance, repertoire, or pedagogy is an important requirement of this degree. The D.M.A. Dissertation is under the immediate supervision of a member of the music theory or music history faculty, and secondarily under the supervision of the advisory committee. It must be acceptable in literary style and organization. Specifications for its preparation are available in the Music Department office. It is the student's responsibility to be certain that the dissertation conforms exactly to the specifications prescribed by the Music Department. The D.M.A. Dissertation receives no academic credit, although the fifteen credits of GRAD 495 (required of students entering in Fall, 1998 or after) are associated with its preparation. It is intended that this document will uphold the highest standards of scholarship, identical to those required of Ph.D. dissertations.

The advisory committee will set a date for completion of the D.M.A. Dissertation, allowing time for each advisor to make suggestions for revisions, and then will set a date for the final examination, allowing time for the student to make those revisions. In some cases, further revision of the dissertation may be required by the advisory committee as a result of the final examination. Final approval of the dissertation following the examination is indicated by the original signatures of all members of the advisory committee on the dissertation's final approval page. This must be submitted to the Graduate School following the examination. Final approval pages must be received at the Graduate School by August 31 for degree conferral as of that date, by December 31 for degree conferral as of that date, or by the May deadline published annually by the Graduate School for degree conferral on Commencement day. It is the student's responsibility to place a copy of the dissertation in the Music Library after acceptance by the committee. The technical specifications for the preparation of the D.M.A. Dissertation are identical to the specifications for the preparation of the Ph.D. dissertation (see "Candidacy and Dissertation Preparation").

No restrictions that limit or delay the accessibility, use, or distribution of the results of any student's research are acceptable, if such delays interfere with the timely completion of a student's academic program.

### Final Examination

The final examination is oral and under the jurisdiction of the advisory committee. It deals mainly with the subject matter of the D.M.A. Dissertation. It is held by August 31 for conferral as of that date, by December 31 for conferral as of that date, or by the May deadline published annually by the Graduate School for degree conferral on



Commencement day. Invitation to participate in the examination is issued by the advisory committee, although any member of the faculty may attend. Not fewer than five members of the faculty, including all members of the candidate's advisory committee, must participate in the final examination unless written approval for a lesser number has been secured in advance from the Dean of the Graduate School. The decision as to whether a candidate has passed or failed the examination rests solely with the advisory committee, which will take into account the opinions of any other participating faculty members. The vote of the advisory committee must be unanimous. Following the examination, the major advisor communicates the results to the student and verifies that the official report has been completed and signed for submission to the Graduate School.



## THE DOCTOR OF PHILOSOPHY DEGREE

The Ph.D. is the highest degree offered by the University and is offered in more than 60 fields of study. The program leading to its attainment is intended to give persons of outstanding ability the opportunity to become creative contributors in a scholarly field. Award of the degree testifies to broad mastery of an established subject area, acquisition of acceptable research skills, and a concentration of knowledge in a specific field.

While certain minimum requirements are set by the Graduate School, it is important for students to realize that work toward this degree is not merely a matter of accumulating course credits or of satisfying other requirements. The degree will be conferred only after the advisory committee and the Graduate Faculty are convinced that the student has developed independence of judgment and mature scholarship in the chosen field. An individual may not earn more than one Ph.D. degree in a single field of study at this institution.

### Time Limits

The equivalent of at least three years of full-time study beyond the baccalaureate or two years beyond the master's degree (in the same or a closely-related field) is required. All work must be completed within eight years of the beginning of doctoral study, or, if the student entered with a master's degree in the same or a closely related field, the doctorate must be completed within seven years. The beginning of doctoral study is defined as the beginning date of the earliest course, wherever taken, listed on the approved doctoral plan of study. The general examination must be passed within five years of the beginning of doctoral study, or within four years if the student entered with a master's degree in the same or a closely-related field. Failure to complete the work within the periods specified or failure to maintain continuous registration (see "Continuous

Registration") will require reevaluation of the student's entire program and may result in a notice of termination. A five-year time limit applies to the acceptability of foreign-language courses. (See "Foreign Language; Related or Supporting Area of Study.")

An extension of a student's terminal date is considered only when there is substantial evidence that the student has attempted to make regular and consistent progress toward completion of degree requirements. A written recommendation to extend the terminal date must bear the signature of the student's major advisor, and it must be submitted in a timely manner to the Graduate School. Approval is granted by the Dean. Each subsequent request to extend a student's terminal date requires greater justification and more extraordinary circumstances. Third requests for extension are rarely, if ever, granted.

### Residence Requirement

The graduate student can fulfill the special demands of a doctoral program only by devoting a continuous period of time to concentrated study and patient research with a minimum of outside distraction or employment. During the second or subsequent years of graduate work in the field, at least two consecutive semesters must be completed in residence. Alternatively, this requirement may be met by combining one semester of residence plus a contiguous 12-week summer period made up of Summer Sessions I & II or Summer Session IV, if agreed upon by the advisory committee and the student. The residence period must be completed through registration for and completion of appropriate course loads or research at the Storrs campus or, if more appropriate, at one of the other sites of instruction and research within the University system. Students ordinarily must register for full-time student status during the residence period (see "Course Loads").

The essential criterion for full-time study as required for fulfillment of the doctoral residence requirement is whether the student is in fact devoting essentially full-time effort to studies, without undue distraction caused by outside employment. It is left to the advisory committee to determine whether a student's outside employment is a distraction that prevents the student from devoting essentially full-time effort to the planned program. The advisory committee will record this determination on the plan of study, along with a description of the nature, extent, and period(s) of outside employment during the residence period.

### Plan of Study

The plan of study must be prepared, signed by the student and the members of the advisory committee, and submitted to the Graduate School for approval by the Executive Committee of the Graduate Faculty Council when the student has completed not more than twelve credits of course work to be applied to the degree. The student may not take the general examination before the plan of study has been fully approved. Failure to present the plan on time may

prolong the period of study for the degree. Before formulating and signing the plan, the major advisor should review a set of transcripts of all undergraduate and graduate work the student has taken. The advisory committee may require that the student take an exploratory examination to guide it in formulating the plan of study.

Courses elected should be consistent with the student's objectives and related to the field in which the degree will be taken. Plans of study will consist largely of courses at the 300's level or above. A limited number of credits at the 200's level (ordinarily not more than six), if not open to sophomores, may be accepted. While there are no specific course requirements for the doctorate, the Executive Committee expects the plan to include about twenty to twenty-four credits of course work – exclusive of any related or supporting area offered in lieu of a non-credit language requirement – beyond the master's degree or its equivalent in the same or a similar field. In other words, the work presented for the Ph.D. degree should equate to 44 to 48 credits beyond the baccalaureate or its equivalent. For students entering in Fall, 1998 or later, at least 15 credits of GRAD 495 (Dissertation Research) must be included in the plan of study, representing the research effort the student devotes to the dissertation.

Special provisions apply to the Ph.D. degree in chemistry and in polymer science.

The plan shall designate any foreign language(s) in which the student is to be tested and any courses comprising a related or supporting area. Course credit by examination is not allowed as a means of accumulating credits to meet the requirements for advanced degrees at this institution. If an examination is permitted to be used to fulfill a related (or supporting) area requirement for the Ph.D. degree, course credit is not given. No course credit is given for the dissertation, but the research toward it is associated with the minimum of 15 credits of GRAD 495 required of students entering in the Fall 1998 or later. The dissertation is regarded as an important part of the student's program and is considered to represent at least one year of full-time graduate study.

Advanced course work taken on a non-degree basis at the University of Connecticut may be included on a Ph.D. plan of study provided the following conditions are met: (1) the grades earned in such course work are B (not B-) or higher, (2) such course work is within the seven or eight year limit (whichever applies) for completion of Ph.D. degree requirements, and (3) such credits have not been applied toward any other degree here or elsewhere (already completed or to be completed in the future). In any event, inclusion of non-degree course work on the plan of study requires the consent of the advisory committee and is subject to the approval of the Executive Committee.

After approval of the plan by the Executive Committee, any request for change must be

submitted to the Graduate School on an official form bearing the signatures of the members of the advisory committee and the student. Such requests are subject to approval by the Executive Committee. The successful completion of all work indicated on the approved plan of study is a fundamental prerequisite to the conferral of the degree.

Once the plan of study is approved, the student and the advisory committee should reevaluate it regularly and modify it, following the established procedure, if appropriate.

### Foreign Language; Related or Supporting Area of Study

Students are required to have a competent reading knowledge of at least one foreign language appropriate to the general area of study *or* at least six credits of advanced work in a related or supporting area. However, an advisory committee may require a competent reading knowledge of more than one foreign language. The committee also may require additional advanced work in one or more related or supporting areas, alone or in conjunction with a foreign language.

If a related or supporting area is required, the courses chosen must comprise a coherent unit of advanced (i.e., 200's level not open to sophomores or above) work outside the major field of study (or area of concentration, if appropriate). Ordinarily, such course work is taken outside the student's "home" department. The courses must be approved by the advisory committee as a part of the plan of study. With few exceptions, they must be taken at this institution. No course credits will be accepted in transfer toward the related or supporting area unless approved by the Executive Committee before the courses are taken. With the approval of the advisory committee, however, the passing of an examination may be substituted for the course work. In the event of a non-language examination, one or more examiners shall be designated by the Executive Committee. With the consent of the advisory committee, a three-credit advanced course in mathematics or statistics passed satisfactorily at this institution may fulfill the otherwise six-credit minimum requirement if the student's preparation contains a suitably advanced prerequisite course (i.e., equivalent to a 200's level University of Connecticut course not open to sophomores) passed satisfactorily at this or another institution (although no course credits will be accepted in transfer).

For a specific language to be considered appropriate, there must exist a significant body of literature written in that language in the student's field. Students should plan to meet any language requirement early in their graduate careers and usually well before they begin preparation for the general examination. One of five methods may be used to establish evidence of reading competence in an approved language. The advisory committee may designate which method shall be used or may leave the choice of method up to the student. For methods (1) through (3), below, courses and examinations will not be accepted if passed more than five years prior to submission of the plan of study for Executive Committee approval.

(1) The student may pass both semesters of an approved one-year reading or intermediate course in the language with grades equivalent to *C* (not *C-*) or higher. This requirement will be considered to be met if, in light of previous preparation, the student is permitted by the instructor to enter directly into the second semester of the one-year sequence and earns a grade of *C* (not *C-*) or higher. The courses may be taken by graduate students on a Satisfactory/Unsatisfactory basis, with a grade of Satisfactory denoting performance at the level of *C* (not *C-*) or higher. The Executive Committee designates courses that may be taken for this purpose. Currently they are French 163-164, French 165-166, German 145-146, Russian 157-158, Spanish 183-184, and Spanish 185-186. Alternatively, the student may pass a course in a foreign language or literature at or above the 200's level, provided that the reading for the course is required to be done in the language.

Language courses taken at other institutions are not accepted. However, the student may consider option (2).

(2) The student may pass an examination set by a member of the University faculty (or, if approved by the advisory committee and the Graduate School, a faculty member at another college or university) designated by the student's advisory committee and approved by the head of the department in which the major advisor holds an appointment. The examiner may be a member of the same department but may not be a member of the student's advisory committee. The examination will include, but need not be limited to, the translation of a passage approximately 400 words in length. The use of a dictionary may be permitted at the option of the examiner. The translation is to be written in English unless permission is granted by the Executive Committee of the Graduate Faculty Council to write it in another language. Such permission is granted only if it is deemed in the best interest of the student and if an acceptable examiner is available. The examiner will choose the passage from among books or articles submitted by the major advisor. The passage may be the same for a group of students in the same field or may be selected individually for each student. The examination must be supervised and have a reasonable time limit. The result of the examination, whether passed or failed, must be reported to the Graduate School on the official form bearing the signature of the examiner.

(3) A doctoral reading examination passed at another graduate school of approved standing may be accepted in transfer (subject to the above five-year limitation) provided the examination was taken prior to the student's enrollment in this Graduate School.

(4) The student may establish evidence of competence in the language through an official transcript stating that the baccalaureate or a higher degree was earned with that language as the major.

(5) The student may establish evidence of competence in the language through documentation that it is the student's native

language, learned in childhood and used primarily through at least secondary school.

### Transfer Credit

Transfer of credit for course work completed at other institutions is approved only after the student has demonstrated the ability to do acceptable graduate work at the University of Connecticut. Such ability must be demonstrated by successful completion of graduate-level, University of Connecticut course work. The equivalent of two years of graduate work completed at accredited institutions may be accepted, provided it is of at least B (not B-) quality and it contributes to the objectives of the proposed doctoral program. Such graduate work may be approved for transfer provided that the general examination is to be passed and all degree requirements are to be completed within the prescribed periods – respectively, four or five years and seven or eight years – from the beginning date of the earliest course, wherever taken, listed on the approved doctoral plan of study. (See "Time Limits.") Transfer credit is not granted for individual courses used toward a degree elsewhere (already completed or to be completed in the future). Instead, consideration is given to that degree program as an entity when the doctoral plan of study is being prepared.

### Evaluation of Performance

The advisory committee continually evaluates the student's performance. Any graduate student whose scholastic record does not meet the minimum requirements of the Graduate School may be subject to dismissal. However, the committee may insist on more than the minimum scholastic requirements and may take other factors into consideration in deciding whether or not to recommend to the Dean that the student be permitted to continue in the degree program.

### General Examination

The general examination is taken near the end of the course program, but not later than eight months prior to the date of completion of all degree requirements. In any event, the examination must be passed within five years of the beginning of doctoral study or within four years if the student entered with a master's degree in the same or a closely related field. The beginning of doctoral study is defined as the beginning date of the earliest course, wherever taken, listed on the approved doctoral plan of study. Foreign language requirements should have been met and the related or supporting area courses completed well in advance. The student may not take the general examination before the plan of study has been approved by the Executive Committee.

The general examination is under the jurisdiction of the student's advisory committee unless the members of the Graduate Faculty in a student's field of study have voted to assign jurisdiction for all or part of the examination to a differently constituted examining committee. The examination may be written, oral, or both. All members of the advisory committee must be present

during any oral examination. A student is examined in the several facets of his or her field of study, not merely in the particular area of concentration. Advisory or examining committees may give a series of cumulative examinations, to be taken at intervals over the student's period of study. For practical purposes, the final part of such a series shall be regarded as "the general examination," and its scope may be limited as the advisory or examining committee may judge appropriate.

The examining committee includes at least one faculty member representing each of the major areas addressed in the examination. Not fewer than five faculty members, including all members of the student's advisory committee, must participate in the examination. All examiners are invited to submit questions and to evaluate answers, but the final decision as to whether or not the student has passed the examination shall rest solely with the advisory committee unless the members of the Graduate Faculty in a student's field of study have voted to assign this authority to a differently constituted examining committee.

After the examination, the major advisor communicates the results to the candidate and immediately sends the official report, bearing the signature of each member of the advisory committee, to the Graduate School. Should the committee permit the student to take the examination in several sections, only the final result should be reported.

### Dissertation Proposal

Before preparation of the dissertation is well underway, the student must file a dissertation proposal addressing the intended research, following the guidelines contained on the special form obtainable at the Graduate School or from the Graduate School website. Failure to file the dissertation proposal early may result in wasted effort on a dissertation if changes are required in the project. If human or animal subjects are involved in the proposed research, special forms must be completed and approval must be granted by the appropriate (either Storrs or Health Center) Institutional Review Board (IRB) or Institutional Animal Care and Use Committee (IACUC). Documentation showing current IRB or IACUC approval is to be submitted to the Graduate School together with the dissertation proposal.

Dissertation proposals are reviewed with the following questions in mind: (1) Is the proposal well written, well organized, and well argued? (2) Does the proposal describe a project of appropriate scope? (3) Does the student demonstrate a knowledge of the subject and an understanding of the proposed method of investigation? (4) Does the student show awareness of the relevant research by others? and (5) Does the student consider how the proposed investigation, if successful, will contribute to knowledge?

When the dissertation proposal has been completed and signed by the student and also has been approved by the members of the advisory committee, the proposal then is submitted to the head of the department or program to which the

student was admitted. The head appoints reviewers from outside the advisory committee to conduct a critical evaluation of the dissertation proposal. The use of at least one reviewer from outside the University is encouraged. Reviewers may be appointed to evaluate an individual student's proposal, or they may be appointed to a committee responsible for reviewing all proposals in a particular field of study or group of related fields of study. The head's signature on the proposal when the review is completed confirms that the results of the review were favorable. The evaluation may take the form of a reading of the proposal or attendance at an oral presentation and discussion of the proposal. The head of the department or program reports the result of its examination of a proposal to the Executive Committee in the form of a recommendation either to approve the proposal, to return it to the student for revisions, or to disapprove the proposal. The dissertation proposal normally should be submitted for review not later than six months before the expected date of degree completion. A copy of the signed approval form and dissertation proposal must be received by the Graduate School when the review process been completed.

### Candidacy and Dissertation Preparation

Upon approval of the plan of study, passing the general examination, and having had the dissertation proposal fully approved by the Executive Committee of the Graduate Faculty Council, the student becomes a candidate for the degree of Doctor of Philosophy. Students are notified of their advancement to Candidacy.

A dissertation representing a significant contribution to ongoing research in the candidate's field is a primary requirement. The preparation of the dissertation is under the immediate and continuous supervision of the advisory committee and it must meet all standards prescribed by the committee and by the Graduate School. It must be acceptable in literary style and organization. Specifications for its preparation may be obtained at the Graduate School or from the Graduate School website. It is the student's responsibility to be certain that the dissertation conforms exactly to the specifications prescribed by the Graduate School.

No restrictions that limit or delay the accessibility, use, or distribution of the results of any student's research are acceptable, if such delays interfere with the timely completion of a student's academic program.

The dissertation is dated as of the calendar year in which all requirements for the degree are met. The advisory committee will set a date for completion of the dissertation, allowing time for each advisor to make suggestions for revision, and will set a date for the final examination, allowing time for the student to make revisions and to submit a complete preliminary or "working" copy of the dissertation at the Graduate School (or, if more appropriate, at a central office at the Health Center in Farmington) at least seven days before the

dissertation defense. When submitted to the Graduate School (or to the Health Center), the complete preliminary or "working" copy of the dissertation must be accompanied by a tentative-approval form signed by all members of the advisory committee.

Following the examination, the student must submit the final, fully-revised original of the dissertation together with an identical second copy to the Graduate School (also another copy if submitted to the Health Center). The identical second copy may itself be an original, or it may be high quality photocopy. Alternatively, both of the final copies of the dissertation submitted to the Graduate School (or to the Health Center) may be high quality photocopies. In any event, at least 25% cotton-content bond paper of at least 20-pound weight must be used for any original and/or photocopy of the dissertation submitted to the Graduate School (or to the Health Center).

In some cases, revision of the dissertation is required by the advisory committee as a result of the final examination. Final approval of the dissertation following the examination is indicated by the presence of original signatures of all members of the advisory committee on the final-approval page, which must be submitted to the Graduate School soon after the student has been examined if no revisions are necessary. In any case, final-approval pages (and the revised dissertation, if changes are required) must be received at the Graduate School by August 31 for conferral of the degree on that date, by December 31 for conferral of the degree by that date, or by the May deadline published annually by the Graduate School for degree conferral on Commencement day. After binding, two copies of the dissertation become the property of the Homer Babbidge Library. If a department or program requires extra copies, it is the student's responsibility to supply them directly to the department or program.

### Abstract, Microfilming, and Other Completion Requirements

At the time the dissertation is submitted, four copies of the abstract (five if the dissertation is submitted to the Health Center) must be submitted to the Graduate School (or with the dissertation at the Health Center). The body of the abstract may not exceed 350 words in length, and it is published in *Dissertation Abstracts*.

Microfilming of the dissertation by ProQuest is required. Agreement forms for this process must be completed by doctoral candidates when submitting the dissertation to the Graduate School (or the Health Center). This form also may be used to arrange for optional copyrighting of the dissertation.

The student is required to pay a fee for the microfilming of the dissertation. There also is a fee for copyrighting the dissertation, if this is desired. There is no charge to the student, however, for the binding of the two final copies of the dissertation. Both final copies become the property of the Homer Babbidge Library.



All doctoral students are required to complete the "Survey of Earned Doctorates," a federal form available at the Graduate School.

### Final Examination

The final examination or dissertation defense is oral and it is under the jurisdiction of the advisory committee. It deals mainly with the subject matter of the dissertation. The examination may not be held not sooner than seven days after a working copy of the complete dissertation and tentative advisory committee approval have been submitted to the Graduate School (or the Health Center) and by August 31 for degree conferral by that date, by December 31 for degree conferral by that date, or by the May deadline published annually by the Graduate School for degree conferral on Commencement day. Invitation to participate in the examination is issued by the advisory committee, although any member of the faculty may attend. Not fewer than five members of the faculty, including all members of the candidate's advisory committee, must participate in the final examination, unless written approval for a lesser number has been secured in advance from the Dean of the Graduate School.

It is required that notification of the time and place of the examination be sent by the major advisor, on a special form, to the Graduate School and to the UConn *Advance* Office in time to appear in the *Advance* not later than seven days prior to the examination. The form is available only from the Graduate School (or the Health Center) or from the Graduate School website. When the *Advance* is not being published (between semesters) or published irregularly (during the summer), the notice nevertheless must be submitted for publication retroactively. Meanwhile, the examination should be advertised widely in the candidate's department and elsewhere throughout the University, as appropriate, at least seven days prior to the examination.

The decision regarding whether a candidate has passed, conditionally passed, or failed the examination rests solely with the advisory committee, which will take into account the opinions of other participating faculty members and other experts. The vote of the advisory committee must be unanimous. Following the examination, the major advisor communicates the results to the student and verifies that the official report has been completed and signed for submission to the Graduate School.



## CONFERRAL OF DEGREES

### Conferral

Degrees are conferred three times each year – August 31, December 31, and Commencement day in May – although there is only one annual graduate commencement ceremony (in May). Students who have completed all requirements for a degree (including the formal application for the degree described below) by the final day of the summer or fall conferral periods or, for doctoral candidates, not later than the Graduate School's published deadline prior to Commencement in May receive their diplomas by mail, normally within three months following conferral.

### Application for the Degree

Formal application must be filed on the official form provided by the Graduate School. If filing is not timely, conferral is delayed to the next conferral period, even though all other degree requirements may have been completed on time.

### Commencement

The graduate Commencement ceremony is held once each year, at the end of the spring semester. Individuals who have had degrees conferred at the end of the previous summer or the previous fall semester and candidates for degrees at the end of the spring semester who complete degree requirements by the published deadline may participate in the annual commencement ceremony and are urged to do so. Academic regalia appropriate for the University of Connecticut degree being conferred is strictly required. Information concerning the Commencement ceremony is distributed by the Graduate School in the spring and is available at that time on the Graduate School website.

## FIELDS OF STUDY

Fields of study and areas of concentration officially recognized by the Graduate School are limited to those listed below. Graduate degrees are awarded in these fields of study. Each field of study is shown in conjunction with the degree or degrees that may be awarded. The final transcript also will record completion of the special requirements of one listed area of concentration, if appropriate. These requirements are determined by a student's advisory committee. The Graduate School does not require that a student select an area of concentration, although an advisory committee may require a student to do so.

Fields of Study Areas of Concentration	Degrees Offered
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Accounting .....	M.S.
Adult Learning .....	Ph.D.
Agricultural and Resource Economics .....	M.S., Ph.D.
Allied Health .....	M.S.
Animal Science .....	M.S., Ph.D.
Physiology of Reproduction	
Anthropology .....	M.A., Ph.D.
Social Science and Health Care <sup>5+</sup>	
Applied Financial Mathematics .....	M.S.
Applied Genomics .....	M.S.
Art .....	M.F.A.
Art History .....	M.A.
Biobehavioral Science & .....	M.S., Ph.D.
Behavioral Genetics	
Developmental Psychobiology	
Hormones and Behavior	
Human Genetics	
Neurochemistry	
Neuromorphology	
Neuropsychopharmacology	
Neurosciences +	
Biochemistry .....	M.S., Ph.D.
Biodiversity and Conservation Biology .....	M.S.
Biomedical Engineering + .....	M.S., Ph.D.
Biomedical Science ++ .....	Ph.D.
Cell Biology	
Cellular and Molecular Pharmacology	
Developmental Biology	
Immunology	
Genetics, Molecular Biology and Biochemistry	
Neuroscience	
Skeletal, Craniofacial and Oral Biology	
Biophysics .....	M.S., Ph.D.
Biotechnology + .....	M.S.
Botany .....	M.S., Ph.D.
Morphology	
Natural Products Chemistry	
Paleobotany	
Phycology	
Plant Cell and Molecular Biology +	
Plant Physiology +	
Plant Systematics	
Business Administration .....	M.B.A., Ph.D.

### Full-time M.B.A. program Areas of Concentration

Finance  
Health Care Management  
Information Technology  
Interactive Marketing  
Management Consulting

Fields of Study Areas of Concentration	Degrees Offered
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### Part-time M.B.A. program Areas of Concentration

Accounting  
Finance  
General  
Health Care Management  
Human Resources &  
International Business  
Management  
Management of Technology  
Marketing  
Real Estate

### Ph.D. program Areas of Concentration

Accounting	
Finance	
Management	
Marketing	
Operations and Information Management	
Cell Biology .....	M.S., Ph.D.
Cytology	
Developmental Biology	
Plant Cell and Molecular Biology +	
Plant Physiology +	
Chemical Engineering .....	M.S., Ph.D.
Chemistry .....	M.S., Ph.D.
Civil Engineering .....	M.S., Ph.D.
Applied Mechanics <sup>5+</sup>	
Environmental Engineering <sup>2+</sup>	
Fluid Dynamics <sup>5+</sup>	
Geotechnical Engineering	
Structural Engineering	
Transportation and Urban Engineering	
Communication Science .....	M.A., Ph.D.
Communication <sup>1</sup>	
Communication Processes and Marketing Communication <sup>5</sup>	
Speech, Language, and Hearing	
Comparative Literary and Cultural Studies + .....	M.A., Ph.D.
Computer Science and Engineering .....	M.S., Ph.D.
Curriculum and Instruction .....	Ph.D.
Bi-lingual and Bi-cultural Education	
Elementary Education	
Secondary Education	
Dental Science ++ .....	M.Dent.Sc.
Dramatic Arts .....	M.A., M.F.A.
Acting	
Design	
Directing &	
Performance/Production <sup>1&amp;</sup>	
Puppetry	
Technical Direction	
Theater History and Criticism <sup>1&amp;</sup>	
Ecology .....	M.S., Ph.D.
Ecology and Biological Control	
Plant Ecology	
Economics .....	M.A., Ph.D.

<sup>1</sup> M.A. degree program only

+ Interdisciplinary program

<sup>2</sup> M.S. degree program only

++ Health Center program only

<sup>5</sup> Ph.D. degree program only

& **Not** accepting new students at this time

Fields of Study Areas of Concentration	Degrees Offered
Education .....	M.A.
Educational Administration .....	Ph.D.
Educational Leadership .....	Ed.D.
Educational Psychology .....	Ph.D.
Cognition/Instruction	
Counseling Psychology	
Evaluation and Measurement <sup>&amp;</sup>	
Gifted and Talented Education	
School Psychology	
Educational Studies .....	Ph.D.
History and Philosophy of Education	
Social Foundations of Education	
Educational Technology .....	Ph.D.
Electrical Engineering .....	M.S., Ph.D.
Control and Communication Systems	
Electromagnetics and Physical Electronics	
Fluid Dynamics <sup>5+</sup>	
Engineering .....	M.Engr.
Civil and Environmental Engineering	
Chemical Engineering	
Computer Science and Engineering	
Electrical and Computer Engineering	
Mechanical Engineering	
Metallurgy and Materials Engineering	
English .....	M.A., Ph.D.
American Studies <sup>1+</sup>	
Entomology .....	M.S., Ph.D.
Morphology and Physiology	
Systematics	
Environmental Engineering + .....	M.S., Ph.D.
French .....	M.A., Ph.D.
Genetics .....	M.S., Ph.D.
Geography .....	M.A., Ph.D.
Geological Sciences .....	M.S., Ph.D.
Geology	
Geophysics	
German .....	M.A., Ph.D.
History .....	M.A., Ph.D.
American Studies <sup>1+</sup>	
Latin American <sup>5</sup>	
Medieval European <sup>5</sup>	
Modern European <sup>5</sup>	
United States <sup>5</sup>	
Human Development and Family Studies .....	M.A., Ph.D.
Human Resource Management .....	M.P.S.
Humanitarian Services Administration .....	M.P.S.
International Studies + .....	M.A.
African Studies	
European Studies	
Italian History and Culture	
Latin American Studies	
Italian .....	M.A., Ph.D.
Judaic Studies + .....	M.A.
Kinesiology .....	Ph.D.
Exercise Science	
Social Science of Sport and Leisure	

Fields of Study Areas of Concentration	Degrees Offered
Linguistics .....	M.A., Ph.D.
Materials Science + .....	M.S., Ph.D.
Alloy Science	
Biomaterials	
Corrosion Science	
Crystal Science	
Dental Materials	
Metallurgy	
Polymer Science	
Mathematics .....	M.S., Ph.D.
Actuarial Science <sup>2</sup>	
Mechanical Engineering .....	M.S., Ph.D.
Applied Mechanics <sup>5+</sup>	
Design	
Dynamics and Control	
Energy and Thermal Sciences	
Fluid Dynamics <sup>5+</sup>	
Manufacturing	
Medieval Studies + .....	M.A., Ph.D.
Metallurgy and Materials Engineering .....	M.S., Ph.D.
Microbiology .....	M.S., Ph.D.
Music .....	M.Mus., M.A., D.M.A., Ph.D.
Conducting <sup>3 and 4</sup>	
Historical Musicology <sup>1</sup>	
Music Education <sup>3 and 5</sup>	
Music Theory and History <sup>5</sup>	
Performance <sup>3 and 4</sup>	
Theory <sup>1</sup>	
Natural Resources: Land, Water, and Air .....	M.S., Ph.D.
Nursing .....	M.S., Ph.D.
Nutritional Science .....	M.S., Ph.D.
Oceanography .....	M.S., Ph.D.
Pathobiology .....	M.S., Ph.D.
Bacteriology	
Pathology	
Virology	
Pharmaceutical Science .....	M.S., Ph.D.
Pharmacy Administration <sup>2&amp;</sup>	
Managed Care Pharmacy <sup>2&amp;</sup>	
Medicinal and Natural Products Chemistry	
Neurosciences +	
Pharmaceutics	
Pharmacology and Toxicology	
Philosophy .....	M.A., Ph.D.
Physical Therapy <sup>6</sup> .....	MS.
Physics .....	M.S., Ph.D.
Physiology and Neurobiology .....	M.S., Ph.D.
Comparative Physiology	
Endocrinology	
Neurobiology	
Neurosciences +	

<sup>1</sup> M.A. degree program only      <sup>6</sup> Integrated B.S./M.S. program only  
<sup>2</sup> M.S. degree program only      + Interdisciplinary program  
<sup>3</sup> M.Mus. degree program only      & **Not** accepting new students at  
<sup>4</sup> D.M.A. degree program only      this time  
<sup>5</sup> Ph.D. degree program only



Fields of Study Areas of Concentration	Degrees Offered
Plant Science .....	M.S., Ph.D.
Agronomy	
Horticulture	
Landscape Architecture <sup>2</sup>	
Plant Breeding	
Plant Environment	
Soil Science	
Political Science .....	M.A., Ph.D.
American Studies <sup>1+</sup>	
Survey Research <sup>1</sup>	
Polymer Science + .....	M.S., Ph.D.
Professional Higher Education Administration <sup>&amp;</sup> .....	Ph.D.
Psychology .....	M.A., Ph.D.
Behavioral Neuroscience	
Clinical	
Cognition/Instruction	
Developmental	
Ecological Psychology	
General Experimental	
Industrial/Organizational	
Language	
Neurosciences +	
Personality <sup>&amp;</sup>	
Social	
Public Administration .....	M.P.A.
Public Health ++ .....	M.P.H.
Social Work .....	M.S.W., Ph.D.
Sociology .....	M.A., Ph.D.
Social Science and Health Care <sup>5+</sup>	
Survey Research <sup>1</sup>	
Spanish .....	M.A., Ph.D.
Special Education .....	Ph.D.
Statistics .....	M.S., Ph.D.
Industrial Statistics <sup>2</sup>	
Survey Research .....	M.A.
Zoology .....	M.S., Ph.D.
Biological Anthropology	
Parasitology	
Systematics and Evolution	

## HEALTH CENTER PROGRAMS

The following degree programs, also included in the preceding Field of Study list, are offered primarily at the University of Connecticut Health Center. Application to these programs should be made to the Graduate School Admissions Office, University of Connecticut Health Center, Farmington, Connecticut 06030-1827. In addition, some interdisciplinary fields of study and areas of concentration involve Health Center fields as participants (see below).

Biomedical Science .....	Ph.D.
Cell Biology	
Cellular and Molecular Pharmacology	
Developmental Biology	
Immunology	
Genetics, Molecular Biology and Biochemistry	
Neuroscience	
Oral Biology	
Dental Science .....	M.Dent.Sc
Public Health .....	M.P.H.

<sup>1</sup> M.A. degree program only      + Interdisciplinary program  
<sup>2</sup> M.S. degree program only      ++ Health Center program only  
<sup>5</sup> Ph.D. degree program only      & **Not** accepting new students at this time

### INTERDISCIPLINARY PROGRAMS

An interdisciplinary program includes substantial course work in two or more existing fields of study. In some programs the degree is awarded in one of the fields of study involved while in other programs the degree is awarded in an interdisciplinary field of study. Where the degree is awarded in an interdisciplinary field of study, the Dean of the Graduate School may choose to appoint an advisory committee which represents the various fields of study involved in an interdisciplinary program. The following is a listing of approved interdisciplinary programs.

#### Interdisciplinary Fields of Study

Programs	Fields of Study Participating	Degrees Offered
Biomedical Engineering	Dental Science (Health Center), Electrical Engineering, Materials Science, Mechanical Engineering, and Psychology	M.S., Ph.D.
Biotechnology	Biochemistry, Biophysics, Cell Biology, Chemical Engineering, Chemistry, Pathobiology, Pharmaceutical Science	M.S.
Comparative Literary and Cultural Studies	English, French, German, Italian, and Spanish	M.A., Ph.D.
Environmental Engineering	Chemical, Civil, and Mechanical Engineering	M.S., Ph.D.
International Studies	Agricultural and Resource Economics, Anthropology, Comparative Literary and Cultural Studies, Economics, History, Philosophy, Political Science, and Sociology	M.A.
Judaic Studies	History, Modern and Classical Languages, Sociology	M.A.
Materials Science	Chemistry, Engineering, Physics, and others	M.S., Ph.D.
Medieval Studies	Art, Dramatic Arts, English, History, Modern and Classical Languages, Music, and Philosophy	M.A., Ph.D.
Polymer Science	Biochemistry, Biophysics, Chemical Engineering, Chemistry, and Physics	M.S., Ph.D.
Survey Research	Political Science, Sociology	M.A.

### Interdisciplinary Areas of Concentration

Each interdisciplinary Area of Concentration listed below is offered in each of the participating Fields of Study indicated in the middle column.

Programs	Fields of Study Participating	Degrees Offered
American Studies	Anthropology, English, History, Philosophy, and Political Science	M.A. in the specific field of study except Anthropology and Philosophy
Applied Mechanics	Civil Engineering and Mechanical Engineering	Ph.D. in the specific field of study
Fluid Dynamics	Civil and Mechanical Engineering	Ph.D. in the specific field of study
Neurosciences	Biobehavioral Science, Pharmaceutical Science, Physiology, and Psychology	M.A. or M.S. and Ph.D. in the specific field of study
Plant Cell and Molecular Biology	Botany and Cell Biology	M.S. and Ph.D. in the specific field of study
Plant Physiology	Botany and Cell Biology	M.S. and Ph.D. in the specific field of study
Social Science and Health Care	Anthropology, Sociology, in conjunction with the Department of Community Medicine and Health Care (Health Center)	Ph.D. in the specific field of study
Survey Research	Political Science and Sociology	M.A. in the specific field of study

# PROGRAMS AND COURSE OFFERINGS

## Programs

Only those Fields of Study and Areas of Concentration identified in the preceding list are recognized by the University and the Graduate School. Here, descriptions of degree programs appear under the titles of the approved fields of study, if possible. In some cases, it has been necessary to group the approved fields of study under a departmental or other title in order to facilitate location in the text. For many of the programs, special requirements (over and above those of the Graduate School) that are generally applied to all students in that program are outlined. However, each student's program is non-departmental in that the advisory committee alone, in supervising it, is directly responsible to the Dean of the Graduate School.

## Course Offerings

The following lists include most of the graduate courses that the University has approved for offering. However, not all courses listed are offered every semester or every year. For actual current offerings, students should consult the appropriate schedule of classes which can be accessed from the Graduate School's registration Web site. Part-time, evening, and summer session students may wish to consult class schedules published by the Office of Credit Programs, Extended and Continuing Education. Descriptions of undergraduate courses are contained in the Undergraduate Catalog. The University reserves the right to change announced offerings.

## Course Numbering System

At the University of Connecticut, undergraduate courses numbered 100-199 are primarily for freshmen and sophomores, undergraduate courses numbered 200-299 are primarily for juniors and seniors. Graduate courses are numbered 300-499. This Catalog contains listings of the 300-499 courses only (although up to six credits of 200's level courses, if not open to sophomores, also may be accepted toward a graduate degree provided they are approved as a part of the student's plan of study).

## Satisfactory/Unsatisfactory Grading

Throughout the text, courses approved by the Executive Committee of the Graduate Faculty Council for Satisfactory (S)/Unsatisfactory (U) grading (see "Standards and Degree Requirements") are designated by the dagger symbol (†).

## Course Semesters

Class schedules for each semester and session can be accessed from the University's PeopleSoft Web site. Not all courses are offered every semester or every year. Information concerning the availability of particular courses may be obtained also from departmental and program offices.

Courses carrying hyphenated numbers are full-year courses extending over two semesters. The first semester of such courses is always prerequisite to the second, but the student may receive credit for the first semester without continuing with the second.

## Course Meeting Times

Information about the specific time(s) that a course will meet may be obtained from the appropriate departmental office at the time of registration or from appropriate class schedules.

## Course Prerequisites

All course prerequisites must be met before a student is permitted to register for the particular course. If, however, the instructor of a course is convinced that the student has the equivalent of such a prerequisite, the instructor may admit the student by providing the student with a unique PeopleSoft permission number (which is valid only for that student to use in registering for the course in question).

## Course Instructor

Students should consult the schedule of classes contained in the PeopleSoft database or contact the departmental office at the time of registration to obtain information concerning course instructor(s).



## Master's and Doctoral Research and Directed Studies Courses

Graduate School courses for master's and doctoral research as well as for directed studies are referenced throughout the programmatic sections which follow. Full descriptions of these courses are given below.

### †GRAD 395. Master's Thesis Research

This course is associated with the research efforts of students pursuing a Plan A master's degree, and may be used to meet the nine-credit Master's research requirement.

*1 - 9 credits. Open only to Plan A master's students.*

### †GRAD 396. Full-Time Master's Research

This course is to be used by those students who have completed all courses on the plan of study and who are performing master's level research on a full-time basis. It may contribute to meeting the nine credit Master's research requirement. No other courses may be taken concurrently. In the summer, this is a 12-week (Summer 4) course. Since this course denotes a

full time commitment, students may not hold graduate assistantships while taking this course.

*3 credits.*

### †GRAD 397. Full-Time Directed Studies (Master's Level)

This course denotes that the student is participating in a full-time internship, field work experience, or other course of off-campus study required as part of the student's Master's program. No other courses may be taken concurrently.

*3 credits.*

### †GRAD 495. Doctoral Dissertation Research

This course is associated with the research efforts of students pursuing a doctoral degree, and may be used to meet the fifteen-credit doctoral research requirement.

*1 - 9 credits. Open only to doctoral students.*

### †GRAD 496. Full-Time Doctoral Research

This course is to be used by those students who have completed all courses on the plan of study and who are performing doctoral level research on a full-time basis. It may contribute to meeting the fifteen credit doctoral research requirement. No other courses may be taken concurrently. In the summer, this is a 12-week (Summer 4) course. Since this course denotes a full time commitment, students may not hold graduate assistantships while taking this course.

*3 credits.*

### †GRAD 497. Full-Time Directed Studies (Doctoral Level)

This course denotes that the student is participating in a full-time internship, field work experience, or other course of off-campus study required as part of the student's doctoral program. No other courses may be taken concurrently.

*3 credits.*



## Non-Credit Continuing Registration Courses

Once the program of study is begun, a graduate degree student must register and pay the appropriate fee(s) in every fall and spring semester (and on occasion, when required, in the summer) until all requirements for the degree have been completed. (See "Continuous Registration" under Registration.) Non-credit course designations GRAD 398 and GRAD 399 are used for master's degree students who other wise are not registered for course work for credit, and GRAD 498 and GRAD 499 are used for doctoral students. These are referenced throughout the programmatic descriptions which follow. An explanation of each non-credit continuing registration course designation is given below.



**GRAD 398. Special Readings (Master's)**

This is a course for which master's degree students must register in the event that their regular program of course work for credit has been interrupted and they are not otherwise registered in a particular semester. (see Continuous Registration.)

*Non-credit.*

**GRAD 399. Thesis Preparation**

This course is for thesis master's student's who are not registered in a particular semester for course work for credit and who already have completed all required credits of GRAD 395.

*Non-credit. Open only to Plan A master's students*

**GRAD 498. Special Readings (Doctoral)**

This is a course for which doctoral students must register in the event that their regular program of course work for credit has been interrupted and they are not otherwise registered in a particular semester. (see Continuous Registration.)

*Non-credit.*

**GRAD 499. Dissertation Preparation**

This course is for doctoral student's who are not registered in a particular semester for course work for credit and who already have completed all required credits of GRAD 495.

*Non-credit. Open only to doctoral students.*



# AGRICULTURAL AND RESOURCE ECONOMICS

*Department Head:* Professor Emilio Pagoulatos  
*Professors:* Bravo-Ureta, Cotterill, Langlois, L. Lee, T. Lee, Lopez, Ray, and Segerson  
*Associate Professors:* Altobello, Larson, and Shah

The Department of Agricultural and Resource Economics offers study leading to the M.S. and Ph.D. degrees in Agricultural and Resource Economics. The master's degree program includes courses designed to provide a foundation in theory, quantification, and policy. The opportunity of selecting a study area is offered via a thesis project and additional courses. Study may be undertaken in two broad areas, namely Agricultural Economics and Resource Economics and Development, including such sub-areas as prices and market performance, production economics, environmental economics, the economics of recreation, econometrics and statistics, economic development, demography, rural sociology, government policies and programs, and capital growth.

Ph.D. candidates usually take the courses listed below and, in addition, select complementary offerings from those available in the Departments of Economics, Natural Resources Management and Engineering, Sociology, and Statistics.

The Department recommends that applicants for admission to the master's program have a background of courses in economic principles, mathematics, and statistics, although there are no fixed requirements.

**Special Requirements for the Ph.D. Degree.** The student takes about ten semester courses beyond the master's program and plans a research project as early as possible in the Ph.D. program. Examples of possible research topics follow: estimation of demand and supply functions, market structure analysis, simulation of firm growth, environmental impacts of economic programs, resource and environmental policy, and studies of economics of scale, interregional competition, spatial and temporal equilibrium, pricing and taxation policies, and resource development.

**Special Facilities.** A collection of production, marketing, and price data is maintained in the Department and is available for testing economic models and hypotheses. Cooperative arrangements with other agricultural institutions provide additional research material. The Department also maintains an ample supply of reports, bulletins, census data, and professional journals.

A staff member is available for assisting in data processing and computer programming, and a file of computer programs is being assembled to widen the selection of research tools.

**COURSES OF STUDY**

**ARE 300. Special Topics**

Topics and credits to be published prior to the registration period preceding the semester offerings.  
*1 - 3 credits, Lecture. May be repeated for credit with change of topic.*

**ARE 305. The Role of Agriculture in Economic Development**

The role of agriculture in the economic development of less developed countries. Population and rural employment, the economics of food consumption and nutrition, international food aid, agricultural marketing and trade, land tenure, agrarian reform, and appropriate agricultural technology.  
*3 credits, Lecture.*

**ARE 307. Benefit-Cost Analysis and Resource Management**

Theoretical foundations and applications of benefit-cost analysis in project appraisal and in evaluation of public policies regarding resource management and environmental protection.  
*3 credits, Lecture.*

**ARE 309. Independent Study in Agricultural Economics**

This course provides the opportunity for graduate students to carry on independent reading or research in the field of the student's needs and interests.  
*1 - 6 credits, Independent Study. Instructor consent required.*

**ARE 314. Human Ecology**

A review of ecological theories and their application to the study of the human community.  
*3 credits, Lecture. Also offered as SOCI 314.*

**ARE 315. Research Methods in Agricultural Economics**

Science and the scientific method. Agricultural Economics as a science. Development of Agricultural Economics in the U.S. tools and techniques of research methods.  
*3 credits, Lecture.*

**ARE 325. Microeconomics I**

Beginning graduate microeconomics covering consumer and producer theory, price determination, economic efficiency, and welfare analysis.  
*3 credits, Lecture. Also offered as ECON 308.*

**ARE 335. Mathematical Programming for Economists**

Procedures for formulating and applying mathematical optimizing techniques. Emphasis is

on the use of linear and nonlinear programming models for researching economic problems.  
3 credits, Lecture.

**ARE 345. Econometrics I**

Construction, estimation, and interpretation of economic behavioral and technical equations using data that are passively generated by a system of simultaneous, dynamic and stochastic relations.

3 credits, Lecture. Also offered as ECON 310

**ARE 351. Demography**

Survey of important theories and issues in the field of demography. This includes topics in the area of population growth and distribution, population composition, mortality, fertility, migration, and population policy.

3 credits, Lecture. Also offered as SOCI 351.

**ARE 353. Methods of Population Analysis**

The sources and characteristics of demographic data and vital statistics and the methods and problems of population data analysis.

3 credits, Lecture. Also offered as SOCI 353.

**ARE 354. Environmental Economics**

Economic analysis of environmental problems and corrective policy instruments. Theory of externalities and public goods, role of uncertainty and imperfect information in policy design, benefit-cost analysis, and non-market valuation. Applications to environmental problems (such as air and water pollution, hazardous waste, and occupational health and safety).

3 credits, Lecture. Prerequisite: ARE 325 or ECON 308. Also offered as ECON 354.

**ARE 355. Economics of Natural Resources**

Economic concepts and issues related to the allocation of stock resources through time, the use and protection of flow resources, and the role of natural resources in economic growth.

3 credits, Lecture.

**ARE 357. Seminar in Human Fertility, Mortality, and Migration**

A review and critique of the literature on fertility, mortality, and migration, and the dynamic interaction of these variables in population change.

3 credits, Lecture. Also offered as SOCI 357.

**ARE 358. Industrial Organization: Empirical Analysis**

Analysis of the structure, conduct, and performance of industries with examples from the food sector and other industries. Explains the development of testable hypotheses from theory, empirical methods, evidence on the level and type of competition, economies of size, product differentiation, entry barriers, and the impact of

alternative organizational forms including cooperatives on economic performance.

3 credits, Lecture.

**ARE 360. Economics of Agricultural Policies**

Applied policy research with emphasis on food and agricultural issues. Policy formation and impacts using applied welfare economics and models of public choice and political economy. Individualized research project.

3 credits, Lecture.

**ARE 375. Theory of Location, Time and Capital**

Economic theory and empirical studies in economic planning over space and time for agricultural products, land and capital.

3 credits, Lecture. Prerequisite: ARE 325 and 335.

†GRAD 395. Master's Thesis Research

1 - 9 credits.

†GRAD 396. Full-Time Master's Research

3 credits.

†GRAD 397. Full-Time Directed Studies (Master's Level)

3 credits.

GRAD 398. Special Readings (Master's)

Non-credit.

GRAD 399. Thesis Preparation

Non-credit.

†GRAD 495. Doctoral Dissertation Research

1 - 9 credits.

†GRAD 496. Full-Time Doctoral Research

3 credits.

†GRAD 497. Full-Time Directed Studies (Doctoral Level)

3 credits.

GRAD 498. Special Readings (Doctoral)

Non-credit.

GRAD 499. Dissertation Preparation

Non-credit.

## ALLIED HEALTH

Dean: Professor Joseph W. Smey

Professors: Adams, Bohannon, Hasson, and Smey

Associate Professors: Coble, Cosmas, Duffy, Faghri, Ilich-Ernst, Kerstetter, Pescatello, Roberts, Tiberio, and Zito

Clinical Associate Professor: Leavitt

The School of Allied Health Professions' graduate program, leading to the Master of Science degree in Allied Health, emphasizes an interdisciplinary approach to graduate study for the student who has completed professional education in one of the allied health fields. The program is designed to prepare health professionals to become leaders and to meet current and future needs in health care.

Emphasis is placed on the development of individualized plans of study to meet the professional and educational goals of each student. Students are required to plan a program of study which includes four components: core, health discipline, an area of emphasis, and thesis or project-practicum. The core courses are designed to provide a cross-disciplinary perspective of (1) health care policy, (2) the allied health professional in contemporary society, and (3) research methods in allied health. The health discipline is broadly defined and includes graduate level courses designed to meet the individual needs of students and to expand their disciplinary competence. Each student selects one area of emphasis and coursework related to his/her long range professional and educational goals. The emphasis areas include: administration, allied health education, dietetics, disability related services, health promotion, medical laboratory science, occupational safety and health, orthotics and prosthetics, and physical therapy.

Students are able to select Plan A (Thesis) or Plan B (Project and Practicum) options within any area of emphasis. In Plan A the thesis utilizes problem solving methodology and the scientific method of inquiry in the completion of a research project. In Plan B the project provides an individualized opportunity to focus and to apply abilities gained during the academic phase of the program. The practicum provides an individualized, supervised practical experience and an opportunity to apply, strengthen, and to develop further knowledge and skills related to the area of emphasis and the health disciplines.

**Admission.** In addition to the standard requirements of the Graduate School, applicants must be health professionals who hold a baccalaureate degree. Applicants are preferred to have at least one year of successful practice in their respective health professions, however this is not mandatory. Three letters of recommendation and a personal statement are required.

**COURSES OF STUDY****Health Promotion and Allied Health Sciences: (GPAH)****GPAH 300. Investigation of Special Topics**

Advanced study for qualified students who present suitable projects for intensive, independent investigation in allied health.  
*1 – 6 credits, Independent Study. Instructor consent required.*

**GPAH 301. Workshop in Allied Health**

Designed to provide allied health professionals with skills and knowledge responsive to contemporary issues and changes in the health fields.  
*1 – 6 credits, Independent Study.*

**GPAH 303. Health Care Policy**

Concepts of health policy with special emphasis on federal policy. Examination of current health policy models, agencies involved in policy development, and the impact of policy on providers and clients. Selected policy issues will be studied through case studies, readings, and discussions with policy makers and regulators.  
*3 credits, Lecture.*

**GPAH 304. The Allied Health Professional in Contemporary Society**

Examination of professional and contemporary issues relevant to the role of the allied health professional in contemporary society. Course focus will include the health care team, compliance issues, professional ethics and legal concerns.  
*3 credits, Lecture.*

**GPAH 305. Program Evaluation for Health Professionals**

A theoretical and practical introduction to program evaluation for health professionals who deliver health care services, manage departments and personnel, or provide training and continuing educational opportunities. Students apply the practical program evaluation framework for health-related intervention programs and document the impact of interventions within health promotion and disease and disability prevention programs. Skill development is facilitated.  
*3 credits, Lecture.*

**GPAH 306. Research Methods in Allied Health**

An inquiry into the nature of research with emphasis on the spirit, logic, and components of the scientific method. Health related research literature is used to aid the student in learning to read, understand, and critically analyze published materials. The preparation of research proposals and reports is emphasized.  
*3 credits, Lecture. Prerequisite: EPSY 309 or a course in basic statistics.*

**GPAH 307. Counseling the Eating Disordered Client**

The psychodynamics of eating disorders are reviewed with emphasis placed on developing the necessary counseling skills for treatment.  
*1 – 3 credits, Lecture.*

**GPAH 309. Health and Aging**

Examination of the theoretical and applied issues in optimizing health for older adults. Focus is on the bio-psycho-social aspects of health; application of current research, and leadership skill building for program development.  
*3 credits, Lecture.*

**GPAH 310. Integrative Seminar in Allied Health Research**

Examination of advanced topics in allied health research. Emphasis is on integrating and applying research concepts and methodology.  
*1 – 3 credits, Seminar. Prerequisite: EPSY 309 and 313.*

**GPAH 311. Financial Management for the Allied Health Professional**

This course provides students with an understanding of selected financial management principles with immediate application to their respective disciplines. Class assignments facilitate financial management, skill development and focus on each student's place of employment and/or professional discipline.  
*3 credits, Lecture.*

**GPAH 312. Integrative Seminar in Allied Health Administration**

Specific topical problems of allied health administration are investigated. Emphasis is on integrating and applying business and health care concepts to the management of allied health activities.  
*3 credits, Lecture.*

**GPAH 313. Managing the Organization for Allied Health Services**

Management of allied health services in emerging and traditional practice settings for allied health professionals. Emphasis is placed on managerial skills, marketing services, and evaluation of quality.  
*3 credits, Lecture.*

**GPAH 314. Problems and Issues in Allied Health Education, Administration and Research**

Examines contemporary issues and problems relevant to allied health practice. Focus is on interdisciplinary exchange of ideas and the development of a project relative to the student's particular program emphasis.  
*1 – 6 credits, Independent Study. Instructor consent required. Prerequisite: At least 15 credits in Allied Health.*

**GPAH 315. Managing Human Resources in Allied Health Organizations**

An examination of the human resource component of allied health services and application of the processes needed to achieve the goals of effective human resource management.  
*3 credits, Lecture.*

**†GPAH 316. Professional Development Seminar**

Analysis of personal goals and professional issues relevant to the planning of the practicum Experience.  
*1 credit, Lecture. Instructor consent required.*

**GPAH 317. Problems and Issues in Allied Health Education, Administration or Research: Professional Development**

The implementation and/or application of theory in the student's emphasis and discipline.  
*1 – 6 credits, Practicum. Instructor consent required. Prerequisite: GPAH 316, which may be taken concurrently.*

**GPAH 319. Allied Health Education Science**

The study and application of current learning theories and principles needed by experienced health professionals to become effective instructors in didactic, clinical, and community settings.  
*3 credits, Lecture.*

**†GPAH 322. Advanced Clinical Dietetics**

Consideration of the physiologic and biochemical alterations in disease states requiring therapy by diet modification. Past and current practice of diet prescription and treatment are evaluated based on present theory, scientific knowledge and factors affecting the individual's ability to carry out the therapy. Effect of medications and other treatments on nutritional status and dietary intake will be included.  
*3 credits, Lecture. Instructor consent required.*

**GPAH 323. Counseling for Health Professionals**

To assess and enhance counseling skills of health professionals. Theories and practices appropriate in preventive and treatment settings are examined. Special issues include: stress management, behavior modification, disability and loss, eating disorders, trauma, sexuality, and cultural considerations.  
*3 credits, Lecture.*

**GPAH 324. Critical Issues in Health Promotion, Disease and Disability Prevention**

An in-depth study of health promotion, disease and disability prevention policies, programs and strategies.  
*3 credits, Lecture. Instructor consent required.*

**GPAH 325. Diagnostic Instrumentation/Advanced Cytotechnology and Medical Microscopy**

This course exposes the student to the innovative manual, semi-automated and



automated methods used in the medical and cytopathology laboratory to assist in the arrival of patient diagnoses, prognoses and monitoring of therapeutic interventions.

*3 credits, Lecture. Open to Medical Laboratory Scientists, others by consent.*

**GPAH 326. Modern Multimedia for Medical Laboratory Scientists**

This course is designed to expose the medical laboratory scientist to various modern methods of multimedia for the delivery of new information needed to maintain an optimal level of competence in the profession.

*3 credits, Lecture. Open to Medical Laboratory Scientists, others by consent.*

**GPAH 327. Quantitative and Analytical Cytopathology and Medical Microscopy**

This course provides theoretical concepts and diagnostic morphological information involving quantitative and analytical cytopathology and advanced medical microscopy.

*3 credits, Lecture. Open to Medical Laboratory Scientists, others by consent.*

**GPAH 328. Cancer Intervention for Allied Health Professionals**

Introduction to cancer from the biologic, pathologic, Wellness Testing and Cancer Prevention, public education, professional education and policy issues perspectives. With this knowledge each student designs and implements a Cancer Intervention Program pertinent to their field of study. Development and use of media models is encouraged in each project emphasizing distant learning, teleconferences and video conferences as a means to present Cancer Intervention Programs.

*3 credits, Lecture. Instructor consent required.*

**GPAH 330. Dissection of the Human Body**

In-depth study of gross structure. Primarily dissection of the adult human cadaver.

*1 – 6 credits, Independent Study. Instructor consent required.*

**GPAH 331. Nutrition for Healthy Communities**

Development of knowledge and skills in public nutrition including community assessment, development of program policies, and program planning, implementation, and evaluation.

*3 credits, Lecture. Instructor consent required.*

**GPAH 340. Clinical Topics in Medical Technology**

Observation, study and practice in special problems, advanced techniques and methodologies in clinical laboratory science. May be repeated in the clinical areas of Clinical Chemistry, Clinical Microbiology, Hematology, and Immunohematology.

*1 – 6 credits, Lecture. Open to Medical Laboratory Scientists, others by consent.*

**GPAH 341. Leadership Development and Contemporary Issues: Implications for the Medical Laboratory**

Examination and development of leadership and management skills through an analysis of contemporary issues confronting the modern medical laboratory.

*3 credits Lecture.*

**GPAH 350. Advanced Theory and Application in Orthopedic Dysfunction**

A comprehensive analysis of the common pathologies of the joints, muscles, and fascia that relate to locomotor function. Common diagnostic tools that are used in the rehabilitation of orthopedic disabilities will be discussed. Major therapeutic regimens including mobilization will be compared and contrasted. Clinical application will be emphasized through case histories.

*3 credits, Lecture. Open to registered physical therapists, others by consent.*

**GPAH 351. Advanced Theory and Application in Cardiopulmonary Dysfunction**

Provides an in-depth analysis of the theory and rationale for major therapeutic evaluative and treatment approaches utilized in the management of the client with cardiac and/or pulmonary dysfunctions. Clinical application of a variety of treatment and evaluative approaches will be emphasized through case histories.

*3 credits, Lecture. Open to registered physical therapists, others by consent.*

**GPAH 352. Advanced Theory and Application in Neurological Dysfunction**

Provides an in-depth study of the neurophysiological influences on normal and abnormal movement throughout the life cycle. Theory and rationale for major therapeutic evaluative and treatment approaches are analyzed. Clinical application will be emphasized through case histories.

*3 credits, Lecture. Open to registered physical therapists, others by consent.*

**GPAH 353. Interdisciplinary Roles in Orthotic/Prosthetic Rehabilitation**

Contemporary orthotic and prosthetic practice and management in multiple settings. Emphasis is on the psychosocial, financial, and consumer aspects of disability using an interdisciplinary approach to contextual care.

*3 credits, Lecture.*

**GPAH 354. Assessment and Treatment of Motor Performance in Patients with Brain Lesions**

Methods of assessment and treatment of motor deficits in adult patients with brain lesions are presented. Course emphasizes predictive factors of motor performance and function.

*3 credits, Lecture.*

**GPAH 355. Advanced Topics in Medical Laboratory Sciences**

Observation, study and practice in special problems, advanced techniques and methodologies in clinical laboratory science.

*3 credits, Lecture. Open to Medical Laboratory Scientists, others by consent*

**GPAH 360. Cross Cultural Health Care**

Exploration of the relationships between culture/ethnicity and health status, health care beliefs and behaviors. Develops greater understanding of, and sensitivity toward the patient's way of life utilizing case examples from the United States and international settings.

*3 credits, Lecture.*

**GPAH 361. Related Services Collaboration**

An interdisciplinary interactive exploration of the ways in which multiple educational and related service personnel collaboratively support children with disabilities and their families across the life span. Team based learning and problem solving emphasized.

*3 credits, Seminar. Instructor consent required.*

**GPAH 380. Loss Control Methods**

This course offers a detailed study of loss control research methods and application techniques with emphasis on the control of hazards using safety engineering methods in a variety of industrial settings.

*3 credits, Lecture.*

**GPAH 381. Advanced Loss Control and Management Theory**

This course offers an in-depth look at the theoretical basis of safety and health management and loss control. The epidemiological concepts are used to analyze Occupational Safety and Health, addressing selected occupational disease or injury mechanisms.

*3 credits, Lecture.*

**GPAH 382. Analysis of Occupational Safety and Health Law and Regulations**

This course provides the substance for understanding the Occupational Safety and Health laws and regulations, the regulatory process, and the research data and analyses required to promulgate or revise a law or regulation.

*3 credits, Lecture.*

**†GRAD 395. Master's Thesis Research**

*1-9 credits.*

**†GRAD 396. Full-Time Master's Research**

*3 credits.*

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**  
*Non-credit.*

**GRAD 399. Thesis Preparation**  
*Non-credit.*

**GPAH 401. Human Performance, Health Promotion, Disease and Disability Prevention Across the Lifespan**

This course uses a lifespan approach to describe human performance to examine salient tertiary health promotion and disability issues. Physical, psychological and social factors influencing rehabilitation activities and programs are explored.

*3 credits, Lecture. Instructor consent required.*  
*Prerequisite: GPAH 324.*

**GPAH 403. Health Promotion, Disease and Disability Prevention Research Seminar**

Inquiry into the theory and nature of research in health promotion, disease and disability prevention. Students are encouraged to meet regularly with their major advisors.

*3 credits, Seminar.*

**GPAH 405. Exercise Intervention for Health Promotion in Persons with Chronic Disease and Disability**

This course provides in-depth information for determining functional capacity and developing appropriate exercise programming for optimizing functional capacity of persons with chronic disease and/or disabilities. Understanding the effects of exercise on the disease process as well as the effects of disease on the exercise responses in chronic disease and disability are explored.

*3 credits, Lecture. Instructor consent required.*

**GPAH 409. Geriatric Nutrition**

This course provides in-depth information on nutritional problems and requirements for the healthy and ill older adult. The focus is on design and critique of research methodology in the nutrition literature. Development and presentation of a major nutrition-related research proposal is required of all students.

*3 credits, Lecture. Instructor consent required.*

**GPAH 420. Clinical Management Models for Health Promotion**

Systematic design and analysis of the roles of health service managers and clinicians in the delivery of services for managed care are addressed. The course will analyze health care delivery from an integrated management-clinician perspective. Attention will focus on patient care and the use of clinical algorithms and critical pathways in health-care delivery.

*3 credits, Seminar. Instructor consent required.*

**GPAH 421. Design and Implementing Health Promotion Programs**

Designed to assist students with the skill development necessary to design and implement health promotion programs via a settings approach. Various program development models will be presented. Experts from the field will be integrated into the course from various programmatic settings.

*3 credits, Lecture. Instructor consent required.*

**GPAH 422. Writing Successful Grant Proposal**

Designed for the advanced graduate student in a health field to obtain experience writing a scientific research proposal. Students will be expected to enter the course with both a fairly well developed research topic and an actual Request for Proposal in hand. The final outcome from this class will be a grant proposal that is suitable for submission to a funding agency.

*0 credits, Lecture. Instructor consent required*

**GPAH 423. Advanced Topics in Stress and Health Promotion**

Selected topics in assessing and treating stress related disorders in health care delivery are examined. Emphasis on diagnosis, treatment, and prevention interventions are examined. Current measures used in assessment along with self-management skills for patients are the focus of this course.

*3 credits, Seminar.*

**GPAH 424. Principles and Practices of Alternative/Complementary Medicine**

The course is designed to critically review the evolving modalities of alternative therapies and mind-body interventions. The major components of alternative medicine, providing a review of the scientific basis, physiology and psychoneuroimmunology of the disciplines of holistic mind-body therapies will be presented. The role of energetics and spirituality in human health promotion and disease prevention will be discussed.

*3 credits, Lecture.*

## AMERICAN STUDIES

A graduate degree in American Studies is not offered. Students who wish to earn the master's-level area of concentration in American Studies must first be admitted to one of the participating fields of study: English, History, or Political Science. The student then informs his or her major advisor and the Director of American Studies of the intention to pursue the concentration.

The student must complete all of the degree requirements of the home field of study. During this process, the student would take two graduate-level courses outside of that field.

To earn the concentration, the student must write an interdisciplinary thesis on a topic approved by the major advisor and the Director of American Studies. The membership of the advisory committee must include one member from outside the home field of study. This committee advises the student during the writing of the thesis and approves it as acceptable for the American Studies concentration.

## ANIMAL SCIENCE

*Department Head:* Professor L. Cameron Faustman  
*Professors:* Darre, Hart, Hoagland, Riesen, and Yang  
*Associate Professors:* Andrew, Dinger, Kazmer, Milvae, Silbart, and Zinn  
*Assistant Professors:* Nadeau, Rasmussen, and Venkitanarayanan

The Master of Science and Doctor of Philosophy degrees are offered in Animal Science with supportive instruction in biochemistry, environmental health, physiology, biology, nutrition, statistics and related fields. All prospective students should have a strong academic background in the biological sciences. In addition to the credit requirements indicated below, M.S. and Ph.D. students are required to complete 1 and 2 credits of ANSC 397, respectively, and 1 credit of ANSC 390. All graduate students receiving assistantship support are required to assist with the teaching of 1 course per year of enrollment.

The M.S. degree offers students the opportunity to emphasize study in animal behavior, animal food products, nutrition, growth, physiology of lactation, physiology of reproduction, environmental health, or production management within Animal Science. Master of Science students are required to conduct thesis research (Plan A) or attain a comprehensive understanding in one of the above outlined areas (Plan B). Plan A programs of study must include a minimum of 15 credits of formal course work exclusive of research. Plan B programs of study must include a minimum of 30 credits of formal course work of which at least two, but not more than four credits, shall be a special research project. Additional specialization may be attained by focusing on dairy and beef cattle, sheep, swine, poultry, horses, companion or aquatic animals or their products.

**Admission.** In addition to the admission requirements of the Graduate School, all applicants are required to submit scores from the General Test of the Graduate Record Examinations.

**The Ph.D. Program.** The Doctor of Philosophy degree is offered in Animal Science with an area of concentration in Physiology of Reproduction. Dissertation research may also emphasize environmental health, animal behavior, animal breeding, animal food products, nutrition, growth, and physiology of lactation. The Ph.D. degree requires demonstrated capabilities for conducting independent research plus related scholarly attributes. Each Ph.D. plan of study must include 44 to 48 credits of course work beyond the baccalaureate degree, not including credits for foreign language or those substituted for foreign language requirements prescribed by the Graduate School.

**Special Facilities.** Modern and extensive laboratory capabilities exist for the support of graduate student research in animal science, reproductive physiology, animal food products, and environmental health. Special laboratory facilities include eight modern endocrinology, physiology, and molecular genetic laboratories; a modern abattoir; and numerous modern field laboratories.

## COURSES OF STUDY

**ANSC 300. Special Topics in Animal Science**  
 1 – 6 credits, *Lecture. Instructor consent required.*

**ANSC 301. Muscle Biology and Meat Science**  
 A study of muscle tissue as it relates to meat quality. Emphasis is on biochemical and physiological processes occurring during the conversion of muscle to meat. Biochemical changes occurring in products during storage is reviewed. Students review critically scientific literature dealing with this subject area.  
 3 credits, *Lecture. Instructor consent required.*

**ANSC 303. Food Chemistry**  
 Chemical, physical and biological changes in foods and food macromolecules that occur during processing and storage that affect texture, color, flavor, stability and nutritive qualities. Field trips may be required.  
 3 credits, *Lecture. Instructor consent required.*

**ANSC 306. Vaccines: Mechanisms of Immune Protection**  
 The focus is on several different approaches to inducing prophylactic immunity in the host. Both traditional and modern molecular approaches to vaccine design will be discussed. In addition, the mechanisms employed by pathogenic microbes to avoid hosts' immune responses will be examined in the context of vaccine design. The students will gain an appreciation for the transition from basic research to practical applications.  
 3 credits, *Lecture. Instructor consent required.*  
*Also offered as PVS 306.*

**ANSC 322. Physiology of Lactation**  
 Examines anatomical, endocrine and metabolic aspects of lactation, emphasizing lactation in dairy cattle. Mastitis prevention and therapy are discussed.  
 3 credits, *Lecture.*

**ANSC 333. Advancements in Ruminant Nutrition**  
 Critical review of current literature on digestive physiology, metabolism, feed processing and management related to ruminant animals.  
 2 credits, *Lecture. Instructor consent required.*

**ANSC 344. Growth and Metabolism of Domestic Animals**  
 An assessment of animal growth and metabolism interrelated to nutrition, selection, environment, production and idiosyncrasies among species.  
 3 credits, *Lecture.*

**ANSC 360. Research**  
 Independent research in animal science, livestock production, meats, dairy production, animal nutrition, growth, reproductive physiology, animal breeding, or environmental health.  
 1 – 6 credits, *Independent Study. Instructor consent required.*

**ANSC 366. Environmental Health**  
 Focuses on the environmental health consequences of exposure to toxic chemicals, food contaminants and radiation. Basic principles of environmental health are discussed, followed by lectures on specific topics such as: cancer and reproductive risks, occupational hazards, radiation, genetic biomonitoring, risk assessment techniques, risk/benefit analysis, social/legal aspects of regulating toxic chemicals, and other related topics.  
 3 credits, *Lecture. Instructor Consent required.*

**ANSC 390. Graduate Presentation Skills**  
 A discussion-based class which prepares students to make oral presentations.  
 1 credit, *Lecture. Instructor consent required.*

**ANSC 395. Independent Study**  
 1 – 3 credits, *Independent Study. Instructor consent required.*

**ANSC 397. Animal Science Seminar**  
 Students present a seminar on the topic of their thesis research (Plan A) or project (Plan B).  
 1 credit, *Seminar. Instructor consent required.*

†GRAD 395. **Master's Thesis Research**  
 1 - 9 credits.

†GRAD 396. **Full-Time Master's Research**  
 3 credits.

†GRAD 397. **Full-Time Directed Studies (Master's Level)**  
 3 credits.

GRAD 398. **Special Readings (Master's)**  
 Non-credit.

GRAD 399. **Thesis Preparation**  
 Non-credit.

**ANSC 477. Current Topics in Ovarian and Uterine Physiology**  
 An in-depth analysis of current topics in ovarian and uterine physiology, pregnancy and parturition.  
 3 credits, *Lecture.*

†GRAD 495. **Doctoral Dissertation Research**  
 1 - 9 credits.

†GRAD 496. **Full-Time Doctoral Research**  
 3 credits.

†GRAD 497. **Full-Time Directed Studies (Doctoral Level)**  
 3 credits.

GRAD 498. **Special Readings (Doctoral)**  
 Non-credit.

GRAD 499. **Dissertation Preparation**  
 Non-credit.



# ANTHROPOLOGY

*Department Head:* Professor W. Penn Handwerker  
*Professors:* Boster, D'Andrade, Dewar, Linnekin, McBrearty, and Wilson  
*Associate Professors:* Dussart, Erickson, and McBride  
*Assistant Professors:* Martínez and Sosis

The Department of Anthropology offers programs leading to the M.A. and Ph.D. degrees in anthropology. Selected study areas at the Ph.D. level include: Old World and Northeast U.S. prehistory, ecology and evolution, cultural anthropology, and medical anthropology; geographic areas include Africa, North America, Central and South America, the Caribbean, and Middle East Europe. Interdisciplinary study in related fields may be pursued in consultation with the major advisor.

**Admission Requirements.** Applicants must present results of the General Test of the Graduate Record Examinations and three letters of recommendation. These should be sent directly to the Administrative Assistant, Graduate Admissions Committee, Department of Anthropology, Box Unit 2176, 344 Mansfield Road, Storrs, CT 06269-2176.

**The M.A. Program.** An undergraduate major in anthropology is not required for admission to the M.A. program. Qualified students who hold a baccalaureate in various fields may be admitted provided that they meet the requirements of the Graduate School and the department.

**The Ph.D. Program.** The department admits into the Ph.D. program only those students whose past work in anthropology on either the undergraduate or the graduate level shows promise of high scholastic ability and whose research interests are compatible with the areas of specialization represented among the faculty. Students are expected to define at the outset the study area which they wish to emphasize. A period of field research normally precedes the writing of the dissertation.

**Interdisciplinary Study.** The medical anthropology area of emphasis involves course work and research in public health at the Health Center in Farmington.

## COURSES OF STUDY

### †ANTH 301. Proseminar

Current theories and issues in Anthropology.  
 1 credit, Seminar.

### ANTH 303. Issues in Human Evolutionary Theory

Evolutionary theory as it applies to human evolution and the implications of human evolutionary history for modern human physical characteristics, behavior, and social organization.  
 3 credits, Lecture.

### ANTH 305. Investigation of Special Topics

Special topic readings or investigations according to the needs of each student.  
 1 – 6 credits, Seminar. Instructor consent required.

### ANTH 306. Human Behavioral Ecology

This seminar will apply the theory of natural selection to the study of human behavior in an ecological setting, with particular focus on the adaptive features and biological design of human behavior.  
 3 credits, Seminar.

### ANTH 308. Human Evolutionary Theory

Evolutionary concepts applied to human body size and shape, diet, disease, group composition, and reproductive behavior.  
 3 credits, Lecture.

### ANTH 309. Violence, Stress, and Social Support

This seminar surveys theory and observations bearing on the nature, sources and consequences of traumatic stress, stressors, and social support in human populations.  
 3 credits, Seminar.

### ANTH 311. Seminar: Contemporary Theory in Social and Cultural Anthropology

3 credits, Seminar. Instructor consent required.

### †ANTH 312. Seminar: Contemporary Theory in Social and Cultural Anthropology

3 credits, Seminar. Instructor consent required.

### ANTH 315. Gender and Culture

Anthropological perspectives on the analysis of gender with special focus on dynamics of gender, culture, and power.  
 3 credits, Seminar. Instructor consent required.

### ANTH 321. Ethnographic Methods I

Theoretical foundations and basic tools used to conduct professional field studies in anthropology. Research design; moral and ethical dimensions of field work; designing and conducting informal, semi-structured and structured interviews (one-on-one and in groups); managing field notes, questionnaires, and data; computer data management; summary statistics and graphics; identifying and interpreting random variation; modeling and testing explanations.  
 1 – 3 credits, Seminar. Instructor consent required.

### ANTH 322. Ethnographic Methods II

Theoretical foundations and basic tools used to conduct professional field studies in anthropology. Research design; moral and ethical dimensions of field work; designing and conducting informal, semi-structured and structured interviews (one-on-one and in

groups); managing field notes, questionnaires, and data; computer data management; summary statistics and graphics; identifying and interpreting random variation; modeling and testing explanations.

1 – 3 credits, Seminar. Instructor consent required.

### ANTH 332. Cognitive Anthropology

The study of how the content of thought or knowledge, is created, organized, and distributed in human communities. Topics include cultural models of the mind, emotions, personality, and relationships.

3 credits, Seminar.

### ANTH 334. Seminar in Culture and Religion

Theories and problems in the analysis of non-western religious systems.

3 credits, Seminar. Instructor consent required.

### ANTH 335. Seminar in Psychological Anthropology

The seminar explores theoretical and empirical relationships between the individual and sociocultural systems, and it seeks to identify worldwide principles of human behavior.

3 credits, Seminar. Instructor consent required.

### ANTH 336. Seminar in Cultural Ecology

Interrelationships between population organization in contrasting preindustrial societies.

3 credits, Seminar. Instructor consent required.

### ANTH 337. Seminar in Economic Anthropology

Issues of scope, method and epistemology. Economic organization and performance in preindustrial societies. Economic development and underdevelopment.

3 credits, Seminar. Instructor consent required.

### ANTH 339. Seminar in Sociocultural Dynamics

An analysis and comparison of contemporary anthropological theories of sociocultural dynamics, with an investigation of selected problems in the study of change and persistence.

3 credits, Seminar. Instructor consent required.

### ANTH 341. Analysis of Rituals

Examines various theoretical contributions to the anthropological study of ritual. Controversies and ambiguities surrounding the social and symbolic significance of the ritual act for both men's and women's experiences and participation are addressed.

3 credits, Seminar. Prerequisite: Anthropology 311.

### ANTH 343. Seminar in Anthropological Linguistics

Inter-relations of language and culture and applications of linguistic theory and techniques to analysis of ethnographic data.

3 credits, Seminar. Instructor consent required.

**ANTH 350. Seminar in Physical Anthropology**

Critical review of selected topics and current issues in the theory and practice of physical anthropology.

*3 credits, Seminar. Instructor consent required.*

**ANTH 352. Medical Anthropology**

An overview of current theory and practice in medical anthropology.

*3 credits, Seminar. Instructor consent required.*

**ANTH 353. Applied Anthropology**

An overview of various applications of anthropology to solve human problems both internationally and within the United States. Emphasis upon history of applied anthropology, ethical considerations, and specific roles of anthropologists in development.

*3 credits, Seminar.*

**ANTH 354. Contemporary Issues in Archaeology**

A critical review of current trends and developments in archaeological method and theory.

*3 credits, Seminar. Instructor consent required.*

**ANTH 356. History of Archaeological Theory**

A critical review of the development of archaeology, with particular emphasis on the theoretical innovations of the 1960s and 1970s.

*3 credits, Seminar. Instructor consent required.*

**ANTH 357. Settlement Systems**

Approaches to human systems of settlement, including the applications of locational models and hierarchical analysis of settlement system data.

*3 credits, Seminar. Instructor consent required.*

**ANTH 358. Analytical Methods in Archaeology**

The use of qualitative and quantitative techniques in the analysis of archaeological data. Topics covered include seriation, sampling, data screening, statistical testing and numerical taxonomy.

*3 credits, Seminar. Instructor consent required.*

**ANTH 359. Advanced Analysis in Archaeology**

An examination of recent developments in archaeological analysis, with particular emphasis on multivariate techniques, new methods of spatial analysis, chronological seriation, and microcomputer applications.

*3 credits, Seminar. Prerequisite: ANTH 358.*

**ANTH 361. The Ecology of Human Evolution**

Early human ancestors as components of past ecosystems. Recovery of ecological information from fossil sites; reconstruction of ancient behavior; relevance of ethology and the study of contemporary foraging people for reconstruction of the past.

*3 credits, Seminar.*

**ANTH 363. Archaeological Site Formation Processes**

The creation of archaeological sites by human behavior and geological forces. The characteristics of various formation processes and identification of them in the archaeological record.

*3 credits, Seminar*

**ANTH 364. New England Prehistory**

Topics in the prehistory of New England. Regional chronology and cultural history, early Holocene adaptation, ecology of hunter-gatherers, coastal adaptations, development of horticulture, and the evolution of tribal societies.

*3 credits, Seminar.*

**ANTH 365. Northeast North American Ethnohistory**

Ethnohistory of northeastern North America from the Contact Period through the 20th century. Social and political organization, land use, subsistence, trade and exchange, mortuary ritual, native responses to Christianity and European trade and settlement. Contemporary issues of reburial and repatriation, federal recognition, and federal and state trust responsibilities for Indian tribes.

*3 credits, Seminar.*

**ANTH 369. Culture and Reproduction**

A cross-cultural overview of human reproduction. Biological, social, cultural, and behavioral factors; cultural patterning of fertility and perinatal behavior; fertility control; gender and power in reproduction.

*3 credits, Seminar.*

**ANTH 374. Seminar in Political Anthropology**

Power, cultural evolution, and social change; law, global relations, identity and ethnicity, revolution and revitalization, the power of numbers, parents and children, women and men.

*3 credits, Seminar.*

**ANTH 375. Ethnographic Methods Laboratory**

Intensive study of selected tools for ethnographic data collection and analysis. Design and implementation of specialized ethnographic interviews; protocols, event histories, life histories, censuses, identity construction. OLS and logistic regression, demographic methods, triads tests, consensus analysis, ProFit analysis, multidimensional scaling, cluster and factor analysis, scale construction and validation, and text analysis.

*1 - 6 credits, Seminar. Instructor consent required.*

**ANTH 376. Ethnomedicine**

Medical systems in cultural context. Traditional healers, herbal medicine, culture bound systems, the meaning of illness, curing and disease. Impact of biomedicine on traditional and alternative medical systems.

*3 credits, Seminar.*

**ANTH 377. International Health**

The role of anthropology in international health, morbidity and mortality, population, maternal and child health, nutrition, infectious diseases and epidemiology, health care infrastructure and underdevelopment.

*3 credits, Seminar. Instructor consent required.*

**ANTH 381. Sex and Gender**

The historical, structural, and personal influences that shape the biocultural phenomena of sex and sexuality.

*3 credits, Seminar.*

**ANTH 382. Universals in Human Behavior**

Examination of evidence regarding cross-cultural universals in human behavior. Selected topics within the following domains may be reviewed: culture, social and emotional behavior; cognitive behavior and development; language and language acquisition.

*3 credits, Seminar. Instructor consent required.*

**ANTH 383. Seminar on Parent-Child Relations in Cross-Cultural Perspective**

Critical analysis of research and theory regarding the antecedents and effects of major dimensions of parental behavior on child development in the U.S.A. and cross culturally. Possible topics include parental warmth, control, punishment and their interactions.

*3 credits, Seminar. Instructor consent required.*

**ANTH 389. Health Transitions**

This seminar surveys theory and observations bearing on the causes and consequences of changes in fertility and mortality rates, and in the configuration of causes of mortality and morbidity in human populations.

*3 credits, Seminar. Instructor consent required.*

**†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

**†GRAD 396. Full-Time Master's Research**

*3 credits.*

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

**†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

## APPLIED MECHANICS

Courses and research opportunities leading toward the Ph.D. degree in the interdisciplinary area of applied mechanics are offered by the Applied Mechanics Committee of the School of Engineering. This Committee comprises faculty members from both the Civil and Environmental Engineering and the Mechanical Engineering Departments. Study areas include elasticity, plasticity, plates and shells, stability, dynamics, wave propagation, vibrations, and biomechanics.

The facilities of the departments are available and include solid mechanics, vibrations, and photoelasticity laboratories. In addition, the University Computer Center is available.

The major advisors authorized to supervise doctoral work in applied mechanics are M. Accorsi, J. DeWolf, H. Epstein, R. Malla, and E. Smith in the field of study of civil engineering; and R. Jeffers, E. Jordan, H. Koenig, and K. Murphy in the field of study of mechanical engineering.

## ART AND ART HISTORY

*Department Head:* Professor Judith Thorpe  
*Professors:* Craig, Mazzocca, Muirhead, Myers, and Talvacchia

*Associate Professors:* Bock, D'Alleve, DiCapua, Givens, Hagen, Noelker, Orwicz, Ostrow, Scalora, and Sloan

*Assistant Professors:* Bock, Dennis, Deibler, Greeley, Machida, Pritchard, and Zurolo

**The Master of Fine Arts.** The Master of Fine Arts degree, a terminal degree for studio artists, requires a minimum of two years study in residence. Graduate level studio work for the serious artist is desirable to enable intensive aesthetic experimentation assisted by the guidance of established professional artists. As a result of such experience, a student is expected to complete a body of art significant in content and of professional quality. Students develop a plan of study in consultation with a major advisor and advisory committee. While the program emphasizes individualized studies concentrating on and combining studio art areas such as ceramics, drawing, painting, photography, printmaking, and sculpture, there also are courses which will enable the student to engage other resources of the Department of Art and Art History and the University community.

**Admission.** Students are admitted to begin study in the fall semester only. Applicants for the M.F.A. degree must first meet the admission requirements of the Graduate School as specified in this Catalog. Consideration for admission also requires submission of the following to the Department of Art and Art History: (1) examples of recent original art presented in the form of photographic color transparencies, or a portfolio of actual works, or a combination thereof; (2) three letters of recommendation; (3) a personal letter of application; (4) official transcripts of all undergraduate and graduate level studies. The principal criterion for admitting applicants into the M.F.A. program is the quality of the art work submitted and the potential for graduate level development it suggests. Applicants are not required to take the Graduate Record Examinations or the Miller Analogies Test.

**Plan of Study.** Students establish their own direction and goals in consultation with a major advisor and an advisory committee. After such consultation, the plan of study is completed for the approval of the student's advisory committee. Candidates for the M.F.A. are required to complete a minimum of 60 credits of graduate course work. This total typically includes 39 credits of graduate studio art distributed as follows: 21 credits in an area of major emphasis, 12 credits outside the area of major emphasis, and six credits of M.F.A. project. An additional 15 credits are to be taken in non-studio graduate art courses and are distributed as follows: nine credits of graduate art seminar, three credits in historical and contemporary issues in art criticism, and three credits of special topics in art history. The remaining six credits are graduate electives. When deemed appropriate by the advisory committee, additional credits in advanced studio or art

history may be required of students whose undergraduate backgrounds are deficient in these areas.

**M.F.A. Project.** Reserved for the last semester of study after candidacy review, the M.F.A. project requires accomplishment of a body of studio work culminating in a substantial exhibition for public viewing, supported by a written statement, public presentation, and a photographic color-transparency portfolio. The advisory committee conducts an oral defense by the candidate of the completed body of studio work and of the written statement. The exhibition is to emphasize work resulting from the M.F.A. project and courses taken in the final year of study. A public presentation is required in conjunction with the exhibition. The photographic color-transparency portfolio, which is to include each work in the exhibition, and the candidate's written statement should be prepared in duplicate for retention in the Department of Art and Art History and in the Art and Design Division of the Homer Babbidge Library.

**Scholastic Standards.** The advisory committee evaluates the student's program whenever a grade of C or lower is recorded for a graduate course. Progress in all courses is monitored by the advisory committee, particularly if a student's cumulative grade point average falls below 3.00 at any time during the course of study. The M.F.A. is not conferred unless the candidate maintains a cumulative grade point average of at least 3.00 in all course work.



**The Master of Arts in Art History.** The Master of Arts in field of Art History emphasizes the application of a range of investigative methods to historical and contemporary visual practices, exploring the ways they inform and organize our understanding of both Western and non-Western visual traditions. This interdisciplinary program provides students with a focused structure for advanced studies in the history, theory, and criticism of visual art. The program highlights the investigation of a range of theoretical and methodological approaches that engage art-making within its social, political and cultural contexts. The Master of Arts in Art History requires a minimum of two years study in residence.

**Admission.** Applicants for the M. A. degree must meet the admission requirements of the Graduate School as specified in this Catalog. Three letters of recommendation, preferably from members of the academic profession, along with a writing sample and personal statement from the applicant are required. Students are admitted to begin study in the fall semester only.

**Advisory Committee.** The advisory committee includes a major advisor and at least two associate advisors, one a member of the Art History faculty and one from outside the Department of Art and Art History. One associate advisor may be chosen from outside the University in accordance with Graduate School procedures.

**Plan of Study.** Candidates for the M.A. are required to complete a minimum of 30 credits of graduate course work including 18 credits of required work and twelve elective credits. A plan of study listing



the courses to be taken must be prepared by the student, and approved by the advisory committee and the Graduate School. Other requirements including specifics regarding the language requirement, the M.A. Thesis, and the Final Examination are described in the pamphlet, *The Graduate Program in Art History*, which may be obtained from the Department of Art and Art History.

**Foreign Language Requirement.** A reading knowledge of one foreign language appropriate to scholarly research in art history is required. Mastery of French, Italian, Spanish, or German are accepted for this requirement; others will be considered by formal petition. Proficiency may be demonstrated by passing a departmental language exam or by passing a graduate-level literature course at the University of Connecticut in one of the accepted languages with a grade of *B* or above. The language requirement must be completed before the student is eligible to take the M.A. Final Examination (Thesis Defense). Language proficiency is considered by the faculty in making graduate assistantship awards.

**M.A. Thesis.** The required M.A. thesis is a research paper of approximately 50 pages that is intended to demonstrate the candidate's mastery of independent scholarly study and a professional understanding of the discipline of art history.

**Final Examination.** The final examination or thesis defense is an oral examination under the jurisdiction of the advisory committee that deals primarily with the subject matter of the thesis.



**Special Facilities.** Since graduate students are required to work in the immediate University vicinity, individual or shared studio space is available. Technical facilities are available in photography, printmaking, sculpture, and ceramics. Located on the main campus is the William Benton Museum of Art and within two hours of driving time from Storrs are the Wadsworth Atheneum, New Britain Museum of American Art, Boston Museum of Fine Arts, Worcester Art Museum, Yale Art Galleries, Lyman Allyn Museum, Slater Museum, and other notable museums and public collections. New York City is just over three hours travel time from the University campus.

## COURSES OF STUDY

### ART

**ART 301. Graduate Studio Art (Ceramics)**  
*3 – 6 credits, Laboratory. Open to students in Studio Art, others with permission.*

**ART 302. Graduate Studio Art (Graphic Design)**  
*3 – 6 credits, Laboratory. Open to students in Studio Art, others with permission.*

**ART 303. Graduate Studio Art (Painting)**  
*3 – 6 credits, Laboratory. Open to students in Studio Art, others with permission.*

**ART 304. Graduate Studio Art (Photography)**  
*3 – 6 credits, Laboratory. Open to students in Studio Art, others with permission.*

**ART 305. Graduate Studio Art (Printmaking)**  
*3 – 6 credits, Laboratory. Open to students in Studio Art, others with permission.*

**ART 306. Graduate Studio Art (Sculpture)**  
*3 – 6 credits, Laboratory. Open to students in Studio Art, others with permission.*

**ART 307. Graduate Studio Art (Drawing)**  
*3 – 6 credits, Laboratory. Open to students in Studio Art, others with permission.*

**ART 310. Graduate Art Seminar**  
Discussions, readings, and analyses relating current studio work to contemporary trends in art.  
*3 credits, Seminar. Open to students in Studio Art, others with permission.*

**ART 330. Interdisciplinary Study**  
Special course work that combines resources in art and/or areas outside of art.  
*3 – 6 credits, Practicum. Open to students in Studio Art, others with permission.*

**ART 340. Studio Art Instruction and Curriculum Planning**  
Teaching methods, strategies, and curriculum planning in studio art instruction.  
*3 credits, Lecture. Must be taken in the first semester in the initial program year by all graduate students with teaching appointments.*

**ART 392. Independent Study**  
*3 – 6 credits, Independent Study. Open to students in Studio Art, others with permission.*

**ART 397. M.F.A. Project**  
Studio work culminating in required exhibition, supported by a written statement, public presentation and photographic color-transparency portfolio.  
*6 credits, Practicum. Open to students in Studio Art, others with permission.*

### ART HISTORY

**ARTH 320. Historical and Contemporary Issues in Art Criticism**  
Seminar investigating selected issues of significance to the criticism of the visual arts, involving a core of general reading and discussion on the history of art criticism from the eighteenth century to the present day. An individual research project culminating in an oral presentation and a final paper on the research are required.  
*3 credits, Seminar. Open to students in Studio Art, others with permission.*

**ARTH 383. Special Topics in Art History**  
Seminar focusing upon a special, limited topic in the history of art. The content will vary from semester to semester.  
*3 credits, Lecture. Open to students in Studio Art, others with permission.*

### ALL SECTIONS

†GRAD 395. Master's Thesis Research  
*1 - 9 credits.*

†GRAD 396. Full-Time Master's Research  
*3 credits.*

†GRAD 397. Full-Time Directed Studies (Master's Level)  
*3 credits.*

GRAD 398. Special Readings (Master's)  
*Non-credit.*

GRAD 399. Thesis Preparation  
*Non-credit.*

## BIOBEHAVIORAL SCIENCE

*Professors:* Buck and Maxson

M.S. and Ph.D. degrees are offered in the field of Biobehavioral Science; however, **no new students are being admitted.**

### COURSES OF STUDY

#### **BIOB 306. Behavioral Genetics**

Concepts and methods in behavioral genetics and neurogenetics with emphasis on current molecular approaches and animal research. *3 credits, Lecture. Prerequisite: Biobehavioral Sciences 324 or 325.*

#### **BIOB 307. Seminar in Developmental Psychobiology**

Biobehavioral foundations of developmental processes in infra-human and human species. *3 credits, Seminar. Instructor consent required.*

#### **BIOB 308. Hormones and Behavior**

Principles of hormone-behavior interaction throughout the lifespan. Emphasis is placed on mammals, including humans. *3 credits, Lecture. Instructor consent required.*

#### **BIOB 309. Human Behavioral Genetics**

Concepts and methods in human behavioral genetic analyses with emphasis on normal variations, psychopathologies, and ethical issues. Seminar/discussion format. *3 credits, Lecture.*

#### **BIOB 310. Biology of Behavior**

A review of classical and current literature in the area of biology of behavior with emphasis on evolutionary and ontogenetic aspects. *3 credits, Lecture.*

#### **BIOB 313. Neuromorphology**

Anatomy and development of the nervous system and the principles of organization of neuronal microcircuits. *1 - 6 credits, Lecture.*

#### **BIOB 316. Neurochemistry**

Energy sources of the nerve cell - chemistry of electrogenic membranes. Synaptic transmission, chemistry and pharmacology. Biochemical development of the nervous system. RNA and protein synthesis in the neuron. Biochemical basis of learning and memory. *3 credits, Lecture.*

#### **BIOB 317. Seminar on Early Infancy**

Prenatal, perinatal and early postnatal influences on the development of the infant. *3 credits, Seminar. Instructor consent required.*

#### **BIOB 319. Seminar on Comparative and Developmental Aspects of Sleep**

The development of sleep from early infancy, implications of deviancy in states for developmental dysfunction, how sleep and waking states affect and are affected by social experience. *3 credits, Seminar.*

#### **†BIOB 320. Seminar in Psychobiology**

Seminar on current literature and current research. *3 credits, Seminar. Instructor consent required.*

#### **†BIOB 321. Seminar on Cellular and Molecular Neurobiology**

Seminar on current research issues in neuromorphology, neurophysiology, neurochemistry, and neuropharmacology. Other related areas will be critically evaluated from an interdisciplinary viewpoint. *1 credit, Seminar. Instructor consent required.*

#### **†BIOB 323. Seminar in Behavioral Genetics**

Seminar on current literature and current research. *3 credits, Seminar. Instructor consent required.*

#### **†BIOB 324. Biobehavioral Sciences I**

Lectures and discussions on the fundamental issues, concepts, and methods of the biobehavioral sciences. *3 credits, Seminar. Instructor consent required.*

#### **†BIOB 325. Biobehavioral Sciences II**

Seminar on faculty research. *1 credit, Seminar. Instructor consent required.*

#### **BIOB 328. Neuropsychopharmacology I**

This course will review the anatomy and physiology of the CNS and then discuss the effects of pharmacological agents on it. Topics include general anaesthetics, hypnotics and sedatives, anticonvulsants, alcohol, muscle relaxants, tranquilizers, hallucinogens, and narcotics. Student presentations will treat topics relating the CNS and behavioral pharmacology. *2 credits, Lecture. Instructor consent required.*

#### **BIOB 329. Neuropsychopharmacology II**

An overview of psychopharmacology; pharmacology of CNS synapses, psychopharmacology of psychoses and depression, hallucinogenic drugs and the human pharmacology of cannabis derivatives. *2 credits, Lecture. Instructor consent required.*

#### **BIOB 330. Research Seminar in Biobehavioral Sciences**

Literature review and discussion of theoretical issues in major research areas. *3 credits, Seminar. Instructor consent required.*

**BIOB 390. Research**  
Conferences, laboratory work, field work, library work covering selected fields in the biobehavioral sciences.

*1 - 6 credits, Independent Study. Instructor consent required.*

#### **BIOB 395. Special Topics - Biobehavioral Sciences**

Advanced study in a given field in the biobehavioral sciences.

*1 - 6 credits, Seminar. Instructor consent required.*

#### **BIOB 396. Seminar on Current Issues**

A colloquium series supplemented by discussion and by optional term paper.

*1 - 3 credits, Seminar. Instructor consent required.*

#### **BIOB 397. Independent Study**

A reading course for those wishing to pursue special work in the biobehavioral sciences.

*1 - 6 credits, Independent Study. Instructor consent required.*

#### **†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

#### **†GRAD 396. Full-Time Master's Research**

*3 credits.*

#### **†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

#### **GRAD 398. Special Readings (Master's)**

*Non-credit.*

#### **GRAD 399. Thesis Preparation**

*Non-credit.*

#### **†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

#### **†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

#### **†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

#### **GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

#### **GRAD 499. Dissertation Preparation**

*Non-credit.*

## BIOLOGY

Course work and research programs leading to the M.S. and Ph.D. degrees are offered through three departments. Descriptions of the major research programs available in each of these departments as well as interdisciplinary areas and a list of faculty are shown below.

### Ecology and Evolutionary Biology

*Department Head:* Professor Gregory J. Anderson  
*Professors:* Caira, Chazdon, Colwell, Desch, Henry, Holsinger, Les, Schaefer, Schlichting, Schwenk, Silander, Simon, Turchin, Wells, and Yarish  
*Associate Professors:* Adams, DiCecco, C. Jones, Rich, Schultz, Taigen, Trumbo, and Wagner  
*Assistant Professors:* Cardon, Goffinet, Jockusch, L. Lewis, P. Lewis, and Rubega

Ecology and Evolutionary Biology emphasizes the diversity and evolution of animals and plants and their interactions with the environment. The department includes the following major areas of research: (1) *Botany* – angiosperm taxonomy and evolution; paleobotany and anatomy; pollination biology; plant morphology; cytotaxonomy; phycology; ethnobotany. (2) *Ecology* – behavioral ecology; population and community ecology; ecosystem ecology; physiological ecology; theoretical ecology; marine ecology; plant ecology; limnology. (3) *Entomology* – insect systematics, biogeography, and evolution; insect ecology; insect behavior. (4) *Zoology* – animal behavior; herpetology; ichthyology; mammalogy; ornithology; parasitology; vertebrate systematics and morphology; (5) *Evolutionary Biology* – population genetics; evolutionary ecology; speciation theory; systematic theory; molecular evolution and systematics.

### Molecular and Cell Biology

*Department Head:* Professor Philip L. Yeagle  
*Professors:* Albert, Benson, Birge, Chen, Geary, Gogarten, Hightower, Kelly, Kendall, Knecht, Krider, Leadbetter, Lynes, Makriyannis, Marcus, McGrane, Sekellick, Strausbaugh, and Yang  
*Associate Professors:* Cole, Fodor, Freake, Giardina, Goldhamer, Noll, Reiter, Rosenberg, Silbart, Smets, Terry, Teschke, Vinopal, Visscher, Wood, Zhang, and Zinn  
*Assistant Professors:* Alexandrescu, Beck von Bodman, Gage, Graf, Lee, M. O'Neill, R. O'Neill

*Adjunct Professor:* Anderson, Craig, and Laue  
*Adjunct Associate Professor:* Perdrizet  
*Adjunct Assistant Professors:* Adamowicz, Barber, Geiger, and Scherzinger

Molecular and Cell Biology emphasizes research in the following areas: (1) *Biochemistry* – protein transport through membranes, receptor/ligand interactions, biochemical signalling, transcriptional and translational regulation, protein folding, molecular chaperones and response to stress; (2)

*Biophysical Chemistry* – enzyme mechanisms, x-ray structural and kinetic analyses of enzymes, structure of membrane interactive peptides and proteins, macromolecular interactions, mechanisms of virus assembly; (3) *Cell and Developmental Biology* – signal transduction, cytoskeleton and cell motility, hormones and morphogenesis, mechanisms of immune function, stress responses, molecular virology and interferons; (4) *Genetics* – organization and regulation of genes and gene families in microbial, plant, virus and animal model systems; genome analysis; molecular evolution; chromosome structure and function; developmental genetics; transposable genetic elements and gene transfer; genetic responses to stress; applied genetics; (5) *Microbiology* – microbial diversity and ecology, evolution, genetics and physiology, microbial biotransformations; (6) *Plant Cell and Molecular Biology* – biological clocks in plants, membrane function, regulation of carbon fixation, cell wall synthesis, plant stress responses, and plant physiology.

### Physiology and Neurobiology

*Department Head:* Professor Angel de Blas  
*Professors:* Armstrong, Chapple, Crivello, Gallo, Goldman, Korn, Maresh, Moiseff, and Renfro  
*Associate Professors:* Cantino, and LoTurco  
*Assistant Professor:* Conover, Nishiyama, Rubio, and Walikonis

Physiology and Neurobiology includes the following major areas of research: (1) *Neurobiology* – cellular and comparative neurobiology with emphasis on neural integration of behavior patterns, synaptic transmission, developmental neurobiology, glial cell biology, regulation and biophysics of ion channels, neuronal mechanisms of calcium and pH regulation, molecular neurobiology; (2) *Endocrinology* – hormonal regulation of ionic levels in the blood of lower vertebrates, hormonal regulation of gene transcription, hormonal regulation of vertebrate organ development; neuroendocrine regulation of luteinizing hormone release, neuroendocrine basis of biological rhythms; (3) *Comparative Physiology* – evolution of physiological adaptations in higher organisms, comparative aspects of osmotic and ionic regulation in vertebrates, transepithelial ion and water transport, renal physiology, muscle physiology.

### Interdisciplinary Areas, Institutes, and Organizations

**Neurosciences.** This is an interdisciplinary area of concentration. Neuroscience is concerned with the structural and functional characteristics of the nervous system and its relation to the adaptive physiology and behavior of the organism. Students in this program may approach the full range of neuroscience studies through courses and research at the cellular, systemic, and organismic levels. A particular strength of the area is the analysis of behavior, its development, and its neurological bases. This area of concentration is offered in the fields of study of biobehavioral science,

pharmaceutical science, physiology and neurobiology, and psychology. Application is made to the preferred field of study, but the applicant must be acceptable to the Neuroscience Committee.

**Plant Biology.** Course work and research opportunities in plant biology are offered in three separate departments. Plant systematics and evolution, plant ecology, plant physiological ecology, plant morphology, and plant molecular systematics and evolution are offered in the Department of Ecology and Evolutionary Biology. Plant physiology, cellular and molecular biology are offered in the Department of Molecular and Cell Biology. Additional course offerings in plant biology are available in the Department of Plant Science.

**Marine Sciences.** Research and teaching facilities for marine sciences are located in Noank, Connecticut, at the mouth of the Mystic River, at the Avery Point campus of the University of Connecticut, and on the main campus in Storrs. Major areas of research include the ecology, physiology, behavior, and systematics of marine organisms; physical and chemical oceanography; sedimentology; and climatology. Recirculating sea water systems are available for maintaining marine organisms over extended periods for research. Direct inquiries to: Department Head, Marine Sciences, University of Connecticut at Avery Point, Groton, Connecticut 06340-6043.

**Biotechnology Program.** The Master of Science degree program in Biotechnology (Plan B) is interdisciplinary and is administered in the Department of Molecular and Cell Biology. A description of the program is available on the Molecular and Cell Biology page of the University website. Information can be obtained by contacting Rene Bruce (Unit 3044, Storrs, CT 06269-3044; 860-486-4317). Contact Dr. Robert T. Vinopal with further questions by mail at the above address or by e-mail at <vinopal@uconnvm.uconn.edu>.

**Biomedical Engineering Program.** The Department of Physiology and Neurobiology participates in a joint program with the School of Engineering for graduate students interested in interdisciplinary work in which biological and engineering disciplines are interrelated. Applicants may have primary training in biology or physical sciences. For information with regard to the biological engineering program, students should write to Dr. William Chapple, Unit 4156, Storrs, Connecticut 06269-4156.

**Materials Science.** The Department of Molecular and Cell Biology also cooperates with other departments in offering masters' degree programs in materials science. Members of this department serve as advisors for the Ph.D. program in polymer science. For information, write to Dr. James Knox, U-136, Storrs, Connecticut 06269-3136.

**The Institute of Cellular and Molecular Biology** was created to bring together members of the faculty and graduate students interested in cellular and molecular biology. The aim of the Institute is to demonstrate the relationship between the separate disciplines by providing a broad theoretical and technical background in cellular and molecular biology.



**Organization for Tropical Studies.** The University of Connecticut is a member of the Organization for Tropical Studies, which offers graduate courses on tropical ecology in Costa Rica. Qualified graduate students in biology and related areas are eligible to participate in the February-March and July-August sessions. For information, write to Director of Graduate Studies, Department of Ecology and Evolutionary Biology, Unit 3043, Storrs, Connecticut 06269-3043.

## COURSES OF STUDY

### Ecology and Evolutionary Biology (EEB)

**EEB 301. Population and Community Ecology**  
Overview of population and community ecology, including population regulation and dynamics, metapopulations, species interactions, biodiversity, community structure, and evolutionary ecology. Theoretical and case-history approaches, emphasizing plants, invertebrates, and vertebrates. Lecture, discussion, and exercises in analysis and modeling.  
*3 credits, Lecture. Open to graduate students in EEB, others with permission.*

**EEB 302. Organisms and Ecosystems**  
Overview of organismal and ecosystem ecology, including biophysical basics, resource utilization and allocation, life history patterns, energetics, matter and energy flow in ecosystems, and temporal and spatial dynamics at ecosystem and landscape scales. Theory, experiments, and computer modeling.  
*3 credits, Lecture. Open to graduate students in EEB, others with permission.*

**EEB 303. Developmental Plant Morphology**  
Exploration and analysis of diversity in plant form using basic principles of plant construction and development. A research paper is required, in which the principles learned in lecture are applied to the analysis of the development of a plant from seed through reproductive maturity.  
*4 credits, Lecture.*

**EEB 304. Aquatic Plant Biology**  
Field and laboratory-oriented study of the anatomy, morphology, ecology, physiology, systematics and evolution of vascular aquatic and wetland plants. A research paper and class presentation are required on a topic pre-approved by the instructor.  
*4 credits, Lecture.*

**EEB 310. Conservation Biology**  
Case studies and theoretical approaches to conservation of biological diversity, genetic resources, plant and animal communities, and ecosystem functions. Topics emphasize ecological and evolutionary principles that form the scientific basis of this emerging, interdisciplinary field, as well as socio-political, legal, economic, and ethical aspects of conservation.  
*3 credits, Lecture.*

**EEB 335W. Vertebrate Social Behavior**  
Lectures and discussions dealing with various aspects of vertebrate social behavior, including territoriality, mating systems, sexual selection, and group behavior. The emphasis is on reading and critical analysis of original literature.  
*3 credits, Lecture.*

**EEB 340. Biology of Bryophytes and Lichens**  
Diversity, evolution, ecology, development and taxonomy of the bryophytes (mosses, liverworts, and hornworts) and lichen-forming fungi.  
*4 credits, Lecture.*

**EEB 348. Population Genetics**  
This course is designed to provide a theoretical background for studies in evolution. Emphasis is placed on understanding the conceptual foundations of the field and on the application of these concepts to an understanding of the roles of mutation, evolution of populations.  
*3 credits, Lecture.*

**EEB 369. Social Insects**  
Behavior, ecology, and evolution of social insects (especially wasps, bees, ants, and termites) with an emphasis on the evolution of social behavior and on the ecological impact of social insects.  
*3 credits, Lecture. Open to graduate students in EEB, others with permission.*

**EEB 371. Current Topics in Molecular Evolution and Systematics**  
Current concepts, ideas and techniques in the field of molecular evolution, and theoretical problems peculiar to the phylogenetic analysis of molecular data.  
*1 credit, Lecture. Also offered as MCB 371.*

**EEB 372. Computer Methods in Molecular Evolution**  
Practical aspects of molecular data analyses. Databank searches, sequence alignments, statistical analyses of sequence data. Parsimony, distance matrix, and spectral analysis methods. Students compile and analyze a data set of their choice.  
*3 credits, Lecture. Also offered as MCB 372.*

**EEB 375. Evolution and Ecology of Communities**  
The evolutionary consequences of ecological interactions between species and the role of evolution in shaping biological communities. Readings, lectures, and discussions emphasize the importance of descriptive, experimental, and theoretical approaches in community biology.  
*3 credits, Lecture. Instructor consent required.*

**EEB 380. Evolution of Green Plants**  
Introduction to morphological, ultrastructural, and molecular characters used for inferring evolutionary relationships of green plants, from green algae to flowering plants, with emphasis on evolutionary changes involved in the

transition from aquatic to terrestrial habitats.  
*4 credits, Lecture.*

**EEB 385. Functional Ecology of Plants**  
Physiological, morphological, and structural responses of plants to the physical and biotic environment and to environmental change. Readings, lectures and discussions emphasize plant responses at all levels of organization, from cells to whole plants. Themes include: organismal integration, consequences and constraints in plant adaptation, and the functioning of plants within communities and ecosystems.  
*3 credits, Lecture.*

**EEB 390. Biology of the Algae**  
Laboratory and field-oriented study of the major groups of algae, emphasizing structure, function, systematics, and ecology.  
*4 credits, Lecture.*

**EEB 395. Independent Study**  
A reading course for those wishing to pursue special work in biology. It may also be elected by undergraduate students preparing to be candidates for degrees with distinction.  
*1 credit, Independent Study. Instructor consent required.*

**EEB 396. Investigation of Special Topics**  
Advanced study in a field within Ecology and Evolutionary Biology.  
*1 – 6 credits, Lecture. Instructor consent required.*

**EEB 397. Research**  
Conferences and laboratory work covering selected fields of Ecology and Evolutionary Biology.  
*1 – 6 credits, Independent Study. Instructor consent required.*

**EEB 445. Advanced Invertebrate Zoology**  
The functional morphology, ecology and evolution of selected invertebrate groups. Field trips are required.  
*4 credits, Lecture. Instructor consent required.*

**EEB 447. Mathematical Ecology**  
Theory and methods of mathematical modeling as applied to ecological systems. Modeling techniques developed around examples from ecological literature.  
*4 credits, Lecture. Instructor consent required.*

**EEB 449. Evolution**  
A review of our current understanding of the patterns and processes of organic evolution. Class periods will include discussion and critical analysis of primary literature.  
*3 credits, Lecture.*

**EEB 452. Field Ecology**  
A field of study of the biotic communities in selected areas of eastern North America.  
*2 credits, Lecture. Instructor consent required.*

**EEB 453. Helminthology**

Morphology, taxonomy, and physiology of the parasitic worms. Methods of culture, preparation for study, and experimental determination of life cycles.

*3 credits, Lecture. Instructor consent required.*

**EEB 454. Mammalogy**

Lectures cover diversity, natural history (including behavior, ecology, reproduction, etc.), and evolution of mammals; readings from original literature are included. Laboratories cover anatomy, systematics, and distribution of major groups of mammals.

*4 credits, Lecture.*

**EEB 457. Advanced Systematic Entomology**

A research course in advanced taxonomy.

*1 – 6 credits, Lecture.*

**EEB 458. Principles and Methods of Systematic Biology**

The basic concepts and modern procedures employed in systematic biology: literature retrieval, species description, phylogenetic inference, nomenclature, and current conceptual issues. Laboratories include computer techniques in phylogenetic analysis.

*4 credits, Lecture. Instructor consent required.*

**EEB 459. Aquatic Insects**

Taxonomic, habitat, and life history studies of aquatic insects.

*3 credits, Lecture. Instructor consent required.*

**EEB 462. Evolutionary Pattern and Process: Experimental Approaches**

A rigorous introduction to the concepts and methods for systematic and evolutionary studies with an emphasis on genetic, molecular (proteins and DNA), and phylogenetic analyses. The laboratory portion provides the opportunity to gain experience in DNA extraction, amplification, sequencing, alignment, and phylogenetic analyses.

*4 credits, Lecture.*

**EEB 463. Plant Ecology**

An advanced course in plant ecology with emphasis on the effects of environment on development of vegetation, metabolism of the ecosystem, cycling of nutrients, growth and succession. Principles of vegetation dynamics, classification and their ecological interpretation will be discussed.

*4 credits, Lecture. Instructor consent required.*

**EEB 465. Herpetology**

Lectures cover environmental physiology, ecology, and behavior of amphibians and reptiles. Emphasis is on readings from the original literature. Laboratories cover evolution, systematics, and distribution of major groups of the world.

*4 credits, Lecture. Instructor consent required.*

**†EEB 469. Seminar**

Study and discussion of current researches, books and periodicals in the field of Biology.

Subtopic designations: Ec, Ecology; M, Mammalogy; Mec, Marine Ecology; Pr, Parasitology; En, Entomology; Bi, Biogeography; Ev, Evolution; Sy, Systematics.

*1 – 3 credits, Seminar.*

**EEB 477W. Insect Phylogeny**

A review of our current understanding of the evolutionary relationships of the major orders and families of insects, including the phylogenetic position of Insecta within Arthropoda.

*3 credits, Lecture.*

**†EEB 480. Seminar in Vertebrate Biology**

Analysis and discussion of current literature in vertebrate biology.

*1 credit, Seminar*

**†EEB 481. Seminar in Biodiversity**

Provides the opportunity for students to present research plans, reports of work in progress, and full-length seminars on completed research projects in ecology, systematics, and evolutionary biology to a supportive but critical audience.

*1 credit, Seminar.*

**†EEB 482. Seminar in Spatial Ecology**

Analysis and discussion of current literature in spatial ecology.

*1 credit, Seminar.*

**†EEB 483. Seminar in Marine Biology**

Analysis and discussion of current literature in marine biology.

*1 credit, Seminar.*

**†EEB 484. Seminar in Plant Ecology**

Analysis and discussion of current literature in plant ecology.

*1 credit, Seminar*

**†EEB 485. Seminar in Comparative Biology**

Analysis and discussion of current literature in evolution and comparative ecology.

*1 credit, Seminar.*

**†EEB 486. Seminar in Systematics**

Analysis and discussion of current literature in systematic biology.

*1 credit, Seminar.*

**†EEB 487. Seminar in Parasitology**

Analysis and discussion of current literature in parasitology.

*1 credit, Seminar.*

**Molecular and Cell Biology (MCB)****MCB 301. Biochemistry**

Metabolism of carbohydrates, lipids, amino acids, proteins, and nucleic acids, including regulation, and to the structure and function of biological macromolecules. Provides suitable preparation for advanced course work in biochemistry, biophysics, and other areas of molecular biology. Graduate students with considerable laboratory experience may arrange to take only the lecture portion of this course as Biology: MCB 396 with consent of instructor.

*5 credits, Lecture. Instructor consent required.*

**MCB 302. Biochemistry Laboratory**

Theory and application of modern techniques for the separation and characterization of biological macromolecules, including several types of liquid chromatography, liquid scintillation spectrophotometry and SDS polyacrylamide gel electrophoresis. Each student will carry out individual projects using selected techniques.

*3 credits, Lecture. Instructor consent required.*

**MCB 303. Biophysical Chemistry I**

Thermodynamics, electrostatics of polar molecules and ionic solutions, dielectric constants, conductance, acid-base equilibria, molecular interactions.

*3 credits, Lecture.*

**MCB 304. Biophysical Chemistry II**

The physico-chemical behavior of biological macromolecules, their interactions, the forces involved, and the physical methods for studying such systems.

*3 credits, Lecture.*

**MCB 307. Biophysical Techniques**

Laboratory experience in the characterization of macromolecules in solution. Methods such as velocity- and equilibrium-sedimentation, density determination, refractometry and light scattering are covered.

*3 credits, Laboratory. Instructor consent required.*

**MCB 308. Theory of Biophysical Techniques**

The characterization of biological macromolecules (i.e., proteins and nucleic acids) in solution is important to the biotechnology and pharmaceutical industries. Hydrodynamic methods (i.e., diffusion, electrophoresis, sedimentation, light scattering, and viscosity) for molecular size and shape, and spectroscopic methods (such as circular dichroism) for more detailed structure.

*3 credits, Lecture. Instructor consent required.*

**MCB 311. Enzyme Structure and Function**

Information at the molecular level derived from protein chemistry, equilibria, kinetics and X-ray diffraction.

*3 credits, Lecture.*

**MCB 312. Foundations of Structural Biochemistry**

Comprehensive introduction to the molecular aspects and dynamics of structural biochemistry. Examination of nucleic acid, protein, and lipid structures including current topics in conformation and folding, enzyme kinetics, nucleic acid stability, ligand/receptor binding, and bioenergetics. Overviews of experimental strategies used to study macromolecular structure and interactions.

*3 credits, Lecture.*

**MCB 313. Structure and Function of Biological Macromolecules**

Correlation of three-dimensional molecular architecture with biochemical function in proteins, nucleic acids, and large assemblies such as viruses and ribosomes. Folding motifs and domains; molecular ancestry/homology; molecular recognition at the atomic level, as in DNA/protein complexes; structural basis of enzyme specificity and catalysis. Structure prediction from sequence; principles of structure determination by x-ray diffraction, NMR and CD spectroscopies, and electron microscopy. X-ray laboratory and graphics demonstrations.

*3 credits, Lecture.*

**MCB 314. Current Topics in Cell Biology**

Discussion of papers from recent literature. Topics include cytoskeletal function, cell motility, gene expression, and signal transduction, with special focus on their relationship to development, the immune system, and cancer.

*1 – 2 credits, Lecture. Instructor consent required.*

**MCB 315. X-ray Structure Analysis**

The determination of three-dimensional atomic-level structure by diffraction methods. Small-angle solution scattering. Protein crystallography.

*3 credits, Lecture. Instructor consent required.*

**MCB 316. Experiments in Bacterial Genetics**

Experiments in bacterial genetics emphasizing genetic manipulations using modern techniques for mutant isolation, DNA characterization and cloning. These include the use of transposons, DNA isolation, restriction analysis, gel electrophoresis, PCR and DNA sequencing. Each student conducts an independent project.

*3 credits, Laboratory. Instructor consent required.*

**MCB 317. Biosynthesis of Nucleic Acids and Proteins**

Mechanisms of protein and RNA synthesis in prokaryotes and eukaryotes. Topics such as RNA processing, gene splicing, and control of protein and RNA synthesis are discussed.

*3 credits, Lecture.*

**MCB 319. X-ray Diffraction Laboratory**

Analysis of low- and high-angle X-ray data from both synthetic and biological macromolecules in amorphous and crystalline states.

*3 credits, Laboratory. Instructor consent required.*

**MCB 321. Molecular Biology and Genetics of Prokaryotes**

Molecular genetics of bacteria, archaeobacteria, and their viruses. Transcription and replication of DNA, transformation, transduction, conjugation, genetic mapping, mutagenesis, regulation of gene expression, genome organization.

Recommended preparation: a course in general microbiology.

*3 credits, Lecture. Instructor consent required.*

**MCB 322. Human Disease and the Development of Therapeutic Agents**

Molecular basis of human disease and strategies for developing therapeutic treatments. Applications of genetic, cellular, and biochemical information in treating different disease states. Especially appropriate for students interested in biomedical research and the health professions.

*3 credits, Lecture.*

**MCB 323. Experiments in Molecular Genetics**

Modern methods in molecular genetics applied to a research goal. Use of polymerase chain reaction, bacteriophage library screening, molecular cloning, nucleic acid hybridizations, and DNA sequence determinations to isolate and characterize a eukaryotic gene.

*3 credits, Laboratory. Instructor consent required.*

**MCB 325. Structure and Function of Biological Membranes**

Overview of cell membrane structure and function based on a foundation of physical and biochemistry principles. Topics include lipid bilayers, vesicles and liposomes, cholesterol, membrane protein structure and function, transport, membrane fusion, receptors, drug/membrane interactions and membranes in cell regulation.

*3 credits, Lecture.*

**MCB 326. Genetic Engineering and Functional Genomics**

Methods and applications of genetic engineering, including gene manipulation and transfer techniques in prokaryotes and eukaryotes. Emphasis on the application of recombinant DNA technology in the elucidation of gene function. Recent technological developments in molecular genetics and the societal issues related to these developments will also be addressed. Students will prepare a grant application or other written assignment.

*3 credits, Lecture.*

**MCB 327. Laboratory Techniques in Functional Genomics**

Molecular biological techniques utilized in gene discovery and in the functional characterization of genes in animal development.

*3 credits, Lecture. Instructor consent required.*

**MCB 331. Developmental Biology**

Principles of embryogenesis, pattern formation,

and cell differentiation. Focus is on molecular and cellular aspects of development in several experimental systems, including the mouse, nematode, fruit fly, and frog. Students will write a paper or present a talk on selected topics.

*3 credits, Lecture.*

**MCB 332. Molecular and Genetic Approaches to Developing Systems**

Topics of current interest in developmental biology are presented with related developmental and genetic background information.

*2 credits, Lecture.*

**MCB 333. Plant Metabolism**

Biochemistry and physiology of the principal metabolic systems of plants.

*3 credits, Lecture.*

**MCB 334. Human Metabolism and Disease**

A thorough analysis of the inter-relationships of metabolic pathways in connection with human health and disease, including inherited metabolic diseases and the role of hormones in metabolic pathways.

*2 credits, Lecture.*

**MCB 335. Protein Folding**

In-depth examination of protein folding in vitro and in vivo. Kinetics and thermodynamics of protein folding and assembly; chaperones in folding and misfolding; misfolding in human disease and biotechnology. Experimental methods used to study protein folding, including NMR, mutagenic and spectroscopic techniques.

*3 credits, Lecture.*

**MCB 336. Industrial Microbiology**

Biology of industrial microorganisms, including their physiology, selection, and biochemical and genetic manipulation. Primary and secondary metabolite biosynthesis and production.

Pollution microbiology and biodegradation.

*3 credits, Lecture.*

**MCB 338. Techniques in Structural Biology**

A short course to introduce graduate students and selected undergraduates to modern techniques in structural biology. Each course offering covers a specific technique: NMR, computational and graphical analysis of biomolecules, X-ray crystallography, analytical ultracentrifugation, spectroscopy, calorimetry, and others.

*2 credits, Lecture. Instructor consent required.*

**MCB 339. Graduate Seminar in Biochemistry**

*1 credit, Seminar.*

**MCB 340. Virology**

Biological, biochemical, genetic, and physical characteristics of viruses, with an emphasis on molecular and quantitative aspects of virus-cell interactions.

*3 credits, Lecture.*



**MCB 343. Molecular Analysis of Development**  
An analysis of the mechanisms of morphogenesis and differentiation with special emphasis on molecular aspects.  
*3 credits, Lecture.*

†**MCB 349. Molecular Genetics**  
A course of lectures on the molecular basis of heredity. The nature and properties of hereditary materials, including replication, mutation, recombination, and repair.  
*3 credits, Lecture.*

**MCB 350. Genetics of Microorganisms**  
Basic genetic processes in microorganisms including homologous and nonhomologous recombination, chromosome mechanics, and mutation; genome organization; transposable elements, their uses in genetic analyses and their role in microbial evolution.  
*3 credits, Lecture.*

**MCB 352. Problems in Genetics of Eukaryotes**  
Consideration of such problems as chromosomal organization, mechanisms of meiotic drive, epigenetic inheritance, chromosome distribution, and transposable elements in model genetic organisms.  
*3 credits, Lecture.*

**MCB 353. Eukaryotic Molecular Biology**  
Considerations of the molecular and cellular biology of eukaryotes with emphasis on current literature. Presentations by faculty and students.  
*2 credits, Seminar. Instructor consent required.*

**MCB 354. Molecular Aspects of Genetics**  
Integration of the biological effects, molecular structure, expression, and evolution of genes and genomes.  
*2 credits, Lecture.*

**MCB 355. Cellular and Molecular Immunology**  
Genetic, biochemical, and cellular control of the immune system, addressing such topics as antigen recognition, immune regulation, stress and immunity, apoptosis, and signal transduction.  
*2 credits, Lecture. Instructor consent required.*

**MCB 356. Animal Cell Culture Laboratory**  
Lecture and laboratory covering basic aspects of cell culture in vitro, including mammalian, avian, fish and insect cells. Laboratory procedures include: preparation of complex and synthetic media; mass and single cell culture; primary and established cell cultures; large scale growth of cells; culture contaminants; cell preservation; growth factors; measurement of cell growth and viability; cell cloning; cell synchrony; cell cycle analysis; karyotyping; mutant isolation; cell fusion/hybridomas; culture of specialized cells; virus propagation; production of specialized cell products; toxicity testing; cell transformation/immortalization; DNA transfection.  
*5 credits, Laboratory. Instructor consent required.*

**MCB 359. Genetics of Higher Plants**  
Use of tools of molecular genetics to address problems in the biochemistry, cell biology, and physiology of higher plants. Topics covered include organ development, signal transduction, carbon partitioning, plant-microbe interactions, and plant genome projects.  
*2 credits, Lecture.*

**MCB 371. Current Topics in Molecular Evolution and Systemics**  
Current concepts, ideas and techniques in the field of molecular evolution, and theoretical problems peculiar to the phylogenetic analysis of molecular data.  
*1 credit, Lecture.*

**MCB 372. Computer Methods in Molecular Evolution**  
Practical aspects of molecular data analyses. Databank searches, sequence alignments, statistical analyses of sequence data. Parsimony, distance matrix, and spectral analysis methods. Students compile and analyze a data set of their choice.  
*3 credits, Lecture.*

†**MCB 374. Graduate Seminar**  
*1 credit, Seminar.*

**MCB 379. Microbial Physiology**  
Topics in microbial cell organization, growth, and intermediary metabolism with emphasis on specialized physiological adaptations.  
*3 credits, Lecture. Instructor consent required.*

**MCB 380. Advanced Cell Biology**  
Integrative approach to the study of eukaryotic cell biology emphasizing structure, function, and dynamics of the cytoskeleton, membrane, and extracellular matrix.  
*3 credits, Lecture.*

**MCB 381. Mechanisms of Bacterial Pathogenicity**  
An in-depth examination of several host-parasite relationships as models of disease states.  
*3 credits, Lecture. Instructor consent required.*

**MCB 382. Physiological Genetics of Bacteria**  
The use of mutants in investigating metabolic pathways and homeostic mechanisms in bacteria, with extensive reference to *Escherichia coli* and its genetic map.  
*3 credits, Lecture. Instructor consent required.*

**MCB 383. Biotechnology Seminar**  
Current topics in biotechnology.  
*1 credit, Seminar.*

**MCB 384. Fermentation and Separation Technology Laboratory**  
Introduction to techniques used for industrial mass culture of prokaryotic and eukaryotic cells

and methods used to extract useful products from these cultures.  
*3 credits, Lecture. Instructor consent required.*

**MCB 393. Special Topics in Cellular and Molecular Biology**  
Consideration of selected topics in cellular and molecular biology. Presentations are made by invited speakers. Each session is preceded by a discussion of readings related to the subject matter of the presentation.  
*2 credits, Seminar.*

†**MCB 394. Seminar in Microbiology**  
Discussion of current topics in microbiology.  
*1 credit, Seminar.*

**MCB 395. Independent Study**  
A reading course for those wishing to pursue special work in biology. It may also be elected by undergraduate students preparing to be candidates for degrees with distinction.  
*1 credit, Independent Study. Instructor consent required.*

**MCB 396. Investigation of Special Topics**  
Advanced study in a field within Molecular and Cell Biology.  
*1 – 6 credits, Seminar. Instructor consent required.*

**MCB 397. Research**  
Conferences and laboratory work covering selected fields of Molecular and Cell Biology.  
*1 – 6 credits, Independent Study. Instructor consent required.*

†**MCB 404. Special Topics in Genetics**  
Intensive reading and discussion in current topics in genetics.  
*2 credits, Seminar.*

**MCB 412. Advanced Plant Physiology**  
Molecular bases of plant development, plant-environment interactions, transport processes, and photosynthate partitioning. The course covers the biochemical and biophysical foundations of plant physiology; emphasis is on the applications of molecular genetics and molecular biology techniques.  
*2 credits, Lecture.*

## Physiology and Neurobiology (PNB)

**PNB 301. Fundamentals of Neurobiology**  
Major topics in neurobiology, including cellular neurophysiology, synaptic physiology, sensory and motor integration, molecular and developmental neurobiology.  
*3 credits, Lecture.*

**PNB 302. Fundamentals of Physiology**

Introduction to integrative biology. Associations of molecules, cells and tissues and their integrated functions across all organizational levels. Application of language and basic concepts of physiology to the development of problem-solving skills.  
3 credits, Lecture.

**PNB 314. The Physiology of Excitable Cells**

In depth study of the molecular structure, function and regulation of ion channels and the mechanisms that control membrane potential and cell excitability. Reading and discussion focus on primary literature.  
2 credits, Lecture.

**PNB 325. Biological Rhythms**

Neuroendocrine and environmental factors in the control of biological rhythmicity, especially circadian and annual rhythms. Emphasis on animals.  
3 credits, Lecture.

**PNB 330. Hormones and Behavior**

Hormones and regulation of behaviors, reproductive, parental, social and aggressive behaviors, as well as migration, hibernation, and learning and memory.  
3 credits, Lecture.

**†PNB 347. Electron Microscopy**

Lectures and laboratory exercises on the principles and practice of biological electron microscopy.  
1 – 3 credits, Lecture. Instructor consent required.

**PNB 351. Advanced Electron Microscopy**

Electron microscopy as a research method in biological sciences.  
1 – 3 credits, Independent Study. Instructor consent required. Prerequisite: PNB 347.

**PNB 390. Membrane Transport**

Fundamental mechanisms by which water and small molecules are transported across biological membranes. Biophysical and biochemical analysis of transport by diffusion, osmosis, channels, carriers and pumps. Physiological integration of different transport mechanisms.  
3 credits, Lecture.

**†PNB 395. Independent Study**

A reading course for those wishing to pursue special work in biology.  
1 credit, Independent Study.

**PNB 396. Investigation of Special Topics**

Advanced study in a field within Physiology and Neurobiology.  
1 – 3 credits, Independent Study.

**†PNB 397. Research**

Conferences and laboratory work covering selected fields of Physiology and Neurobiology.  
1 – 6 credits, Independent Study.

**†PNB 400. Seminar in Neurobiology**

An in-depth study of selected topics in the molecular, cellular, and central aspects of neurobiology.  
1 credit, Seminar.

**PNB 402. Seminar in Comparative Physiology**

1 credit, Seminar.

**†PNB 403. Seminar in Endocrinology**

1 credit, Seminar.

**PNB 404. Seminar in Biological Rhythms**

1 credit, Seminar.

**PNB 407. Microcomputer Applications in Physiology**

Introduction to techniques for interfacing computers to biological experiments including the acquisition and processing of biological data in real time.  
3 credits, Laboratory.

**PNB 417. Developmental Neurobiology**

Molecular mechanisms of neurodevelopment. Neural induction, cell fate determination, neurogenesis, axon targeting, neuronal migration, synapse formation and activity-dependent synaptic remodeling.  
3 credits, Lecture. Prerequisite: PNB 301.

**PNB 418. Integrative Neurobiology**

Physiology of the central nervous system: information processing and central mechanisms in vertebrates and invertebrates; physiological aspects of behavior.  
3 credits, Lecture. Prerequisite: PNB 301.

**PNB 419. Neurobiology Laboratory**

Modern research techniques in cellular and CNS physiology. Includes training in the use of electronic neurophysiological instruments, and in the design and performance of experiments with several different types of neural and muscular preparations.  
3 credits, Laboratory.

**PNB 423. Human Reproduction**

The physiology of human reproduction.  
3 credits, Lecture.

**PNB 425. Comparative Physiology**

Physiological and biochemical adaptations of animals. Emphasis on the integrative responses of vertebrates.  
3 credits, Lecture

**PNB 426. Molecular and Cellular Neurobiology**

The molecular basis of synaptic transmission and other signaling mechanisms of communication among nerve cells. Extracellular and intracellular molecular messengers and signal transduction mechanisms. Cellular functions involved in differentiation, proliferation and survival of nerve cells.  
3 credits, Lecture. Prerequisite: PNB 301.

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**Thesis and Dissertation Research & Non-Credit Continuous Registration**

**†GRAD 395. Master's Thesis Research**

1 - 9 credits.

**†GRAD 396. Full-Time Master's Research**

3 credits.

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

3 credits.

**GRAD 398. Special Readings (Master's)**

Non-credit.

**GRAD 399. Thesis Preparation**

Non-credit.

**†GRAD 495. Doctoral Dissertation Research**

1 - 9 credits.

**†GRAD 496. Full-Time Doctoral Research**

3 credits.

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

3 credits.

**GRAD 498. Special Readings (Doctoral)**

Non-credit.

**GRAD 499. Dissertation Preparation**

Non-credit.

## BIOMEDICAL ENGINEERING

*Program Director:* Professor John D. Enderle

Biomedical Engineering (BME) is an interdisciplinary profession that encompasses the broad area of interaction among the life sciences, physical sciences, medical science and engineering. It concerns itself with the investigation and solution of problems associated with living systems that go beyond the customary specialization in biology, medicine and engineering. The Web site at [www.bme.uconn.edu](http://www.bme.uconn.edu) further describes the program.

The goal of biomedical engineering graduate program is to provide students the interdisciplinary training in biological and medical sciences, physical sciences, and engineering necessary to solve complex biomedical problems. Faculty members from engineering, biomedical sciences, materials sciences, chemistry, physics, medicine, and dental medicine form an interdisciplinary graduate degree program that spans the University of Connecticut campuses at Storrs and at the Health Center in Farmington. Biomedical engineering can embrace the following diverse yet complementary research areas: biochemical engineering, bioinstrumentation, biomaterials, biomechanics, biomedical imaging/biosignal processing, biosensors, biotechnology, cellular and tissue engineering, clinical engineering, ergonomics, physiological systems modeling, neurobiology, and rehabilitation engineering.

An entering student's primary undergraduate training may be in engineering, the physical sciences, medicine or biology. However, all students must demonstrate competence in mathematical analytical methods, certain basic and advanced skills in engineering and computer science, as well as a knowledge of the fundamentals of physical and biological sciences at the time of their graduation. Because of the diverse interests and varied backgrounds of the students in biomedical engineering, plans of study are flexible and necessarily broad in scope. Plans of study are developed in consultation with the student's advisory committee, are designed to meet individual needs.

**Application Procedure.** Applicants are required to submit to the BME Program Director three letters of recommendation (preferably from members of the academic profession) and a personal letter from the student describing their interest in biomedical engineering.

**The M.S. Program.** Students whose primary training is in engineering can prepare themselves for entrance into one of the biomedical fields by completing a program leading to the master's degree in biomedical engineering. The program also offers the biology and chemistry student a means of achieving the mathematical, engineering, and instrumentation skills necessary for research in certain areas of biological science and biomedical engineering.

Only the Plan A (thesis option) is offered. Eight graduate courses (24 credits), nine credits of Master's Thesis Research (GRAD 395), and the writing and oral defense of a thesis are required. Courses required of all M.S. students include:

- BME 310 – Physiological Systems I
- BME 311 – Clinical Instrumentation [*or* BME 354 – Bioinstrumentation]
- BME 312 – Human Biomechanics
- BME 313 – Introduction to Biomaterials and Tissue Engineering
- BME 315 – Physiological Modeling.

The remaining courses are selected from the BME course offerings and should be consistent with the student's background, interests, and career plans. Exceptions to the specified M.S. course requirements must be approved by the BME Program Director.

**The Ph.D. Program.** Applicants to the Ph.D. program are expected to demonstrate outstanding ability and to show, based on their record of previous scholarship and experience, that they are likely to do superior creative work in their respective fields. Holding a master's degree from this or any other institution does not render the applicant automatically admissible to a doctoral program. In general, doctoral applicants must meet all admission requirements for the master's degree as Regular graduate students and must present evidence that they are capable of doing independent work of distinction.

Beyond the M.S., a minimum of 24 credit hours of BME course work (which must include BME 318 – Physiological Systems II) is required for the Ph.D. Additionally, 15 credits of Doctoral Dissertation Research (GRAD 495) are required.

If a doctoral student has not taken the five required M.S. courses or their equivalents (see "The M.S. Program"), these courses are required in addition to the course work and research credits otherwise required for the Ph.D. The BME Program Director must approve any exceptions to the course requirements.

Research required for the doctoral degree in biomedical engineering involves the use of advanced engineering techniques for the solution of a biological or medical problem. To accomplish this objective, a student whose primary training is in the biological sciences must develop core skills in mathematics, engineering, computer science, and physical sciences through regular courses. Engineers are required to qualify in basic biomedical sciences. All students are brought together in biomedical engineering courses offered in the program. Once a research area has been chosen, the student develops expertise in this area by advanced course work, seminars, and tutorial work in the department of his or her major advisor.

**Clinical Engineering Internship.** This is a hospital-based, two-year program supported by the clinical engineering departments of Hartford Hospital, The John Dempsey Hospital (UCHC), Baystate Medical Center, and West Haven V.A. Hospital. Applications should be received by January 1 for full consideration. As part of the selection process, applicants are invited to the hospital and campus in February and March for interviews. The interview is required to secure a graduate assistantship (paid internship). Final selections are made in April for Fall admission. Each intern is expected to spend 20 hours per week in a hospital's clinical engineering department. The primary objectives are to: (1) provide exposure to hospital organization and administrative

structure; (2) provide an opportunity to apply engineering techniques to patient care and hospital-based research; and (3) provide substantial hands-on experience working with health care technology and hospital personnel, including administrators, nurses, technicians and medical staff. Clinical engineering trainees are supported by stipends contributed by the participating hospitals. Students accepted for the internship earn a Plan A Master's degree.

The following courses are required of all Clinical Engineering interns: BME 310 (Physiological Systems I); BME 311 (Clinical Instrumentation) or BME 354 (Bioinstrumentation); and BME 350 (Clinical Engineering Fundamentals). The remaining courses are taken only from the BME course offerings, and should be from engineering disciplines related to the student's background, interests and future career plans. The BME Program Director must approve any exceptions to the course requirements.

**Industrial Engineering Internship.** The industrial internship offers an in-depth, vigorous, industrial experience that complements the engineering expertise gained in the classroom. Companies located throughout New England participate in the program. The primary objectives of this industrial internship program for the intern are to provide: exposure to the industrial workplace; the opportunity to apply engineering knowledge and expertise to a variety of industrial projects; and the opportunity to interact with a variety of industrial work groups, including administrators, engineers, and technicians.

Applications should be received by January 1 for full consideration. As part of the selection process, applicants are invited to participating industries and to campus in February and March for interviews. The interview is required to secure a graduate assistantship (paid internship). Final selections are made in April for Fall admission.

Two types of internships are offered—one for master's degree candidates and the other for Ph.D. degree candidates.

**Master's Internship:** Typically, the student works for the company and performs appropriate non-proprietary engineering company directed tasks for 20 hours per week and is provided an opportunity to explore activities of interest at the company for an additional 15-20 hours per week. During year 1, it is hoped that this exploration process permits the student to identify an appropriate master's thesis project and to have it endorsed by both academic and industrial coordinators by the end of year 1. It is important to note that the company mentor assumes responsibility for assisting the student in selecting an appropriate research project that is then approved by the major advisor. During year 2, the student works on the M.S. project (during the 15-20 hour period each week) in addition to performing company related tasks (20 hours).

**Ph.D. Internship:** The Ph.D. internship follows the master's model initially with coursework and weekly workload, but it is of greater duration appropriate for the doctoral degree. Typically, the student works for the company and performs appropriate non-proprietary engineering company directed tasks for 20 hours per week. Interns have the opportunity to explore activities of interest at the



company for an additional 15-20 hours per week. During year 1, it is hoped that this exploration process permits the student to identify an appropriate dissertation topic and to have it endorsed by both academic and industrial coordinators by the end of year 1. The industry mentor assumes responsibility for assisting the student in selecting an appropriate research project, which is then approved by the major advisor. During year 2 and beyond, the student works on the dissertation (during the 15-20 hour period each week) in addition to performing company related tasks (20 hours). The expected length of the internship is three years beyond the M.S. degree (the length of time can be as long as four years depending on the student's background).

**Research Facilities.** Because of the interdisciplinary nature of the Biomedical Engineering field of study, graduate research facilities in biomedical engineering are diverse, and can be found in the various academic departments of the biomedical engineering major advisors on the Storrs campus and at the University of Connecticut Health Center in Farmington.

**Graduate Advisors in Biomedical Engineering.** The following faculty serve as graduate major advisors in the biomedical engineering research areas listed below:

*Biochemical Engineering:* M. Epstein, C. Erkey, R. Weiss, R. Srivastava, and T. Wood

*Bioinformatics:* I. Greenshields M. Sarfarazi, D. Shin, and R. Simon

*Biomaterials:* J. Bryers, C. Davis, J. Goldberg, D. Kreutzer, M. Wei, and R. Weiss

*Biomechanics, Rehabilitation Engineering, and Ergonomics:* D. Adams, M. Cherniack, C. Davis, J. Enderle, M. Epstein, P. Faghri, K. Kazerounian, M. L. Newport, N. Olgac, D. Peterson, and N. Warren

*Biosensors and Bioinstrumentation:* M. Escabi, M. Fox, D. Kreutzer, and Q. Zhu

*Biotechnology:* T. Chen, M. Epstein, D. Kreutzer, and T. Wood

*Cellular and Tissue Engineering:* J. Bryers, M. Epstein, D. Kreutzer, M. Sarfarazi, and R. Simon

*Clinical Engineering:* J. Enderle

*Imaging and Biosignal Processing:* J. Enderle, M. Epstein, M. Escabi, M. Fox, S. Lai, L. Loew, D. Kim, D. Oliver, R. Simon, and Q. Zhu

*Physiological and Biomedical Modeling:* L. Bernstein, W. Chapple, V. Clark, D. Das, J. Enderle, M. Epstein, M. Escabi, D. Kim, J. Ligas, L. Loew, A. Moiseff, D. Oliver, and C. Pilbeam

*Neural Systems Engineering:* J. Enderle, Mescabi, and D. Kim

#### **Adjunct Faculty in the Graduate School.**

*Adjunct Associate Professors:* Bronke, Eisenfeld, and McIsaac

*Adjunct Assistant Professors:* Noyes, Painter, and Rosow

**Program Director.** For further information, contact the Program Director and Graduate Admissions Chair of the Biomedical Engineering graduate field of study, Dr. John D. Enderle, Biomedical Engineering, University of Connecticut, 260 Glenbrook Road, Unit 2157, Storrs, CT 06269-2157. Phone: (860) 486-5521. E-mail: jenderle@bme.uconn.edu

## COURSES OF STUDY

### **BME 300. Special Topics In Biomedical Engineering**

Classroom and/or laboratory courses in special topics as announced in advance for each semester.

*1 – 6 credits, Lecture.*

### **BME 310. Physiological Systems I**

The goal of this course is to introduce human physiology with an engineering perspective. Students are expected to know the eleven major human organ systems as well as cell structure and function. Topics covered include: integumentary, endocrine, lymphatic, digestive, urinary, reproductive, circulatory, respiratory, nervous, skeletal, and muscular. A major paper for one of the organ systems is required that highlights the engineering viewpoint and how it relates to the current literature.

*3 credits, Lecture. Also offered as MEDS 471.*

### **BME 311. Clinical Instrumentation Systems**

Analysis and design of transducers and signal processors; measurements of physical, chemical, biological, and physiological variables; special purpose medical instruments, systems design, storage and display, grounding, noise, and electrical safety. These concepts are considered in developing devices used in a clinical or biological environment.

*3 credits, Lecture.*

### **BME 312. Human Biomechanics**

Applies principles of engineering mechanics in the examination of human physiological subsystems such as the musculoskeletal system and the cardiovascular system. Topics drawn for biosolid mechanics, biofluids, and biodynamics, the viscoelastic modeling of muscle and bone, non-Newtonian fluid rheology, blood flow dynamics, respiratory mechanics, biomechanics of normal and impaired gait, and sport biomechanics.

*3 credits, Lecture.*

### **BME 313. Introduction to Biomaterials and Tissue Engineering**

A broad introduction to the field of biomaterials and tissue engineering. Presents basic principles of biological, medical, and material science as applied to implantable medical devices, drug delivery systems and artificial organs.

*3 credits, Lecture.*

### **BME 315. Physiological Modeling**

Unified study of engineering techniques and basic principles in modeling physiological systems. Focuses on membrane biophysics, biological modeling, and systems control theory. Significant engineering and software design is incorporated in homework assignments using MATLAB and SIMULINK.

*3 credits, Lecture.*

### **BME 316. Computational Neuroscience**

Explores the function of single neurons and neural systems by the use of simulations on a computer. Combines lectures and classroom discussions with conducting computer simulations. The simulations include exercises and a term project.

*3 credits, Lecture. Instructor consent required.*

### **BME 318. Physiological Systems II**

A problem based learning course that focuses on in-depth coverage of four human organ systems with an engineering perspective. An extensive literature review is required for each topic which culminates in a major report that highlights the engineering standpoint unified mathematically. Case studies are used to develop each topic. Format: didactic session followed by group problem solving.

*3 credits, Lecture. Prerequisite: MEDS 471 or BME 310 or consent of instructor. Also offered as MEDS 472.*

### **BME 320. Independent Study**

Individual exploration of special topics as arranged by the student with an instructor of his or her choice.

*1 – 3 credits, Independent Study. Instructor consent required.*

### **BME 321. Biochemical Engineering**

Principles and design of processes involving biochemical reactions. Nature of biological materials, biochemical kinetics, heat and mass transfer, application to fermentation and other biological processes.

*3 credits, Lecture. Also offered as CHEG 373.*

### **BME 331. Biofluid Mechanics**

Provides a foundation for continued studies of biofluid mechanical subjects. Topics covered include kinematic principles, the Navier-Stokes equations, the vorticity equation, unsteady fluid flows of physiologic relevance, turbulence and interfacial phenomena. Emphasis is placed on physical analysis of the cardiovascular and pulmonary systems, as well as of other biologic systems of interest.

*3 credits, Lecture. Prerequisite: BME 312.*

### **BME 350. Clinical Engineering Fundamentals**

Provides the fundamental concepts involved in managing medical technology, establishing and operating a clinical engineering department, and the role of the clinical engineering designing facilities used in patient care. Topics covered include managing safety programs, technology assessment, technology acquisition, the design of clinical facilities, personnel management, budgeting and ethical issues of concern to the clinical engineer.

*3 credits, Lecture. Instructor consent required.*

### **BME 351. Engineering Problems in the Hospital**

Aim is to familiarize the student with engineering problems in a modern hospital. Role of the

small computer in the hospital; implanted pacemakers; heart catheterization. Students are expected to investigate and solve an engineering problem associated with clinical medicine as a semester project.

*3 credits, Lecture. Instructor consent required.*

### **BME 353. Biomedical Instrumentation**

#### **Laboratory**

Experimental investigation of electrodes, transducers, electronic circuits and instrumentation systems used in biomedical research and clinical medicine.

*3 credits, Lecture. Instructor consent required.*

### **BME 354. Biomedical Instrumentation I**

Origins of bioelectric signals; analysis and design of electrodes and low noise preamplifiers used in their measurement. Statistical techniques applied to the detection and processing of biological signals in noise, including the treatment of nerve impulse sequences as stochastic point processes. Methods of identifying the dynamic properties of biosystems. Assumes a background in linear systems and electronics.

*3 credits, Lecture. Prerequisite: BME 311.*

### **BME 355. Biosensors**

Principles and design of acoustic imaging transducers, and force, pressure and hearing sensors. Covers also optical biosensors including oxygen monitoring sensors, glucose sensors and optical sensors used in imaging.

*3 credits, Lecture. Prerequisite: BME 311.*

### **BME 357. Communication and Control in Physiological Systems**

Processing, transmission, and storage of information in nerve systems. Mechanisms of neurosensory reception, coding and signal-to-noise ratio enhancement. Analysis of invertebrate and vertebrate visual systems. Neural spatio-temporal filters in feature extraction and pattern recognition. Analysis of control systems and regulators associated with vision: e.g., gaze control, accommodation, pupil area, and intraocular pressure. Assumes a background in linear systems and feedback control systems.

*3 credits, Lecture.*

### **BME 358. Biomedical Imaging**

Fundamentals of detection, processing and display associated with imaging in medicine and biology. Topics include conventional and Fourier optics, optical and acoustic holography, thermography, isotope scans, and radiology. Laboratory demonstrations will include holography and optical image processing. Assumes a background in linear systems.

*3 credits, Lecture.*

### **BME 359. Advanced Ultrasonic Imaging Techniques**

Introduction to advanced techniques of ultrasonic

image formation for biomedical applications. Introduction to acoustic wave propagation. A, B, C, M and Doppler ultrasonic imaging modes. Interaction of ultrasound with biological tissue. Acoustical holography. Ultrasonic transducer design and calibration. Transducer arrays. Ultrasound detection modes. Laboratory demonstrations will include Schieren visualization of ultrasound fields and transducer calibration techniques. Assumes a background in linear systems.

*3 credits, Lecture. Prerequisite: EE 378.*

### **BME 365. Cellular Systems Modeling**

Cellular response to drugs and toxins, as well as normal cell processes such as proliferation, growth and motility often involve receptor-ligand binding and subsequent intracellular processes. Focuses on mathematical formulation of equations for key cellular events including binding of ligands with receptors on the cell surface, trafficking of the receptor-ligand complex within the cell and cell signaling by second messengers. Background material in molecular biology, cell physiology, estimation of parameters needed for the model equations from published literature and solution of the equations using available computer programs are included. Examples from the current literature of cell processes such as response to drugs and proliferation will be simulated with the model equations.

*3 credits, Lecture. Prerequisite: BME 312.*

### **†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

### **†GRAD 396. Full-Time Master's Research**

*3 credits.*

### **†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

### **GRAD 398. Special Readings (Master's)**

*Non-credit.*

### **GRAD 399. Thesis Preparation**

*Non-credit.*

### **†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

### **†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

### **†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

### **GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

### **GRAD 499. Dissertation Preparation**

*Non-credit.*

## **BIOMEDICAL SCIENCE**

*Field of Study Coordinator:* Professor Barbara E. Kream

The following programs leading to the Ph.D. degree in various areas of the biomedical sciences are offered at the University of Connecticut Health Center at Farmington. Further information about these programs may be obtained from the Biomedical Sciences Graduate Admissions Committee, University of Connecticut Health Center, Farmington, Connecticut 06030-3906.

### **Cell Biology**

*Program Director:* Professor Ramadan Sha'afi

*Professors:* A. Arnold, Berlin, Carmichael, A. Fein, Feinstein, Hansen, Hla, Jaffe, Koppel, Liang, Loew, Peluso, Pfeiffer, Rowe, Schenkman, Sha'afi, Watkins, White, and C. Wu, G. Wu

*Associate Professors:* R. Clark, Furneaux, S. King, Pachter, Perdrizet, Pilbeam, Terasaki, Watras, and D. Wu

*Assistant Professors:* Bansal, Caron, Claffey, Cowan, Dorsky, Fong, Goodman, Graveley, Han, Menoret, O'Rourke, Rodionov, and Shapiro

The Cell Biology graduate program offers a program of study for the Ph.D. degree with comprehensive training in the modern molecular and cellular research. The program is composed of Health Center faculty from basic as well as clinical departments, all of whom are conducting state-of-the-art research. The fundamental philosophy of the Cell Biology program is to advance knowledge in basic and clinical problems from the cellular and molecular perspective.

The program is particularly strong in these research areas: angiogenesis, cancer biology, cytoskeleton and molecular motors, gene expression, molecular medicine, optical methods, reproductive biology, sensory transduction, signal transduction, tumor immunology, and vascular biology.

### **Developmental Biology**

*Co-Program Directors:* Associate Professor Stephen

Helfand and Assistant Professor Brenton Graveley

*Professors:* A. Arnold, A. Das, G. King, Hansen, Hla, Jaffe, Kosher, Kream, LaLande, Maxwell, Morest, Peluso, Radolf, Rossomando, Rowe, Sarfarazi, M. Tanzer, Tsipouras, Upholt, White, and Wikel

*Associate Professors:* S. Clark, Dealy, Epstein, Gunzl, Helfand, Kuchel, Lichtler, Mina, Reenan, and Rosenberg

*Assistant Professors:* Ben Mamoun, Claffey, Fong, Graveley, and Kresch

The Ph.D. program in the area of concentration of Developmental Biology stresses cellular and molecular mechanisms of differentiation and development. Primary emphasis is placed upon regulation of gene expression and molecular events in development. Areas of emphasis include: (1) molecular biology of cell differentiation and aging;

(2) molecular endocrinology emphasizing hormonal regulation of gene expression; (3) receptor-mediated processes in cell development; (4) subsidiary programs in human genetics and genetics of human connective tissue disorders. Courses of study include broad training in cell, molecular, and developmental biology.

### Immunology

*Program Director:* Professor Stephen Wikel

*Associate Program Director:* Assistant Professor Leonardo Aguila

*Professors:* Bigazzi, Cone, Das, Goldschneider, Kreutzer, Lefrançois, Lorenzo, Mukherji, J. O'Rourke, Radolf, Rajan, Srivastava, and Wikel

*Associate Professors:* Clark, Huang, Puddington, Thrall, and Zeff

*Assistant Professors:* Adler, Aguila, Li, Menoret, and Vella

The Ph.D. program in the area of concentration of Immunology is focused on the cellular and molecular aspects of immune system structure and function in animal models and in humans. Areas of emphasis include: (1) Molecular immunology: mechanisms of antigen presentation; T cell receptor genes; major histocompatibility complex genetics and function; cytokines and cytokine receptors; tumor antigens; (2) Cellular immunology: biochemical mechanisms and biological aspects of signal transduction of lymphocytes and granulocytes; cellular and molecular requirements of thymic and extrathymic T lymphocyte development, selection and activation; cytokines in B and T cell development; regulation of anti-tumor immunity; immunoparasitology including parasite genetics and immune recognition of parasite antigens; mechanisms of inflammation; (3) Organ-based immunology: immune effector mechanisms of the intestine; lymphocyte interactions in the lung; immune regulation of the eye; and (4) Autoimmunity: animal models of autoimmune disease, or effect mechanisms in human autoimmunity.

### Cellular and Molecular Pharmacology

*Program Director:* Associate Professor Joel Pachter

*Professors:* Cinti, Fein, Feinstein, Liang, Loew, Pappano, Schenkman, and Smilowitz

*Associate Professors:* Epstein, S. Hewett, Hurley, C. Malchoff, Pachter, and Rosenberg

*Assistant Professors:* Gary, J. Hewett, Jansson, Levine, D. Malchoff, and O'Rourke

The Ph.D. program in the area of concentration of Cellular and Molecular Pharmacology includes the study areas of neuropharmacology, cardiovascular and pulmonary pharmacology, endocrine-reproductive pharmacology, immunopharmacology and chemotherapy and enzymes of xenobiotic biotransformation. Signal transduction at the cellular and subcellular level is the theme of the interdisciplinary research that includes faculty from other basic science departments at the Health

Center. Signaling mechanisms from the plasma membrane to the nucleus are represented in the research programs of the faculty.

### Genetics, Molecular Biology and Biochemistry

*Program Director:* Associate Professor Robert Reenan

*Professors:* A. Arnold, Carmichael, Carson, A. Das, Eipper, Eisenberg, Glasel, Hla, G. King, Klobutcher, Koppel, Lalande, Osborn, Ozols, Pfeiffer, Radolf, Rajan, Rothfield, Rowe, Setlow, Shanley, and Weller

*Associate Professors:* Clark, Fureaux, Gunzl, Helfand, S. King, Lichtler, Mayer, Peng, Reenan, and D. Wu

*Assistant Professors:* Ben Mamoun, Cowan, Graveley, Harris, Mohler, and Rogina

The Ph.D. program in the area of concentration of Genetics, Molecular Biology and Biochemistry explores biological phenomena at the molecular level with special emphasis on the genetic and biochemical mechanisms controlling biosynthesis, structure and function of macromolecules and their assembly into organized cellular structures. There are five major study areas: (1) relation of the structure of macromolecules to their function, with special emphasis on the structural base for the activity of enzymes and the interactions of macromolecules in biological systems; (2) biosynthesis of macromolecules, including nucleic acids, proteins, and polysaccharides; (3) control of gene expression in bacteria, viruses and eucaryotic cells; and (4) assembly of macromolecules into complex cellular structures during the processes of cellular development and differentiation; and (5) genetic and molecular basis of complex cellular processes, such as cell division and cellular development and differentiation.

### Neuroscience

*Program Director:* Professor Elizabeth Eipper

*Professors:* Barbarese, Carson, Eipper, Frank, Kim, Kuwada, Loew, Mains, Maxwell, Morest, Oliver, Papermaster, Pappano, Pfeiffer, Potashner, Smilowitz, and Trahiotis

*Associate Professors:* Bernstein, Deckel, Epstein, Helfand, S. Hewett, Pachter, Shoemaker, and Waitzman

*Assistant Professors:* Bansal, Busciglio, Clark, Conti, Covault, Gary, J. Hewett, Lai, Levine, Rasband, Reenan, Schiller, St. Marie, Wang, and Zecevic

The neuroscience program brings an interdisciplinary approach to research with the goal of understanding the normal function and disorders of the nervous system. The interdepartmental program of study encompasses experimental approaches ranging from the molecular to the systems level, including areas of cellular, molecular, and developmental neurobiology, neuroanatomy, neurophysiology, neurochemistry, neuroendocrinology, neuropharmacology, and neuropathology. Specific topics include: biology of neurotransmission; mormonal and transmitter receptors structure and

function; structure and function of voltage-sensitive ion channels; control of gene expression and membrane biogenesis in neurons and glia; gene expression, release and roles of endogenous opioids; electrophysiology of excitable tissue; development of the autonomic nervous system; cell culture of neural tissue; stimulus coding, synaptic organization, development of sensory systems; structure and function of auditory and gustatory systems; mathematical modeling; degeneration, regeneration, plasticity, and transplantation, studying normal and disordered function; molecular basis of neurological disease: stroke, Huntington's disease, Alzheimer's disease, multiple sclerosis, and deafness/hearing loss.

### Skeletal, Craniofacial and Oral Biology

*Program Director:* Professor William Upholt

*Professors:* Arnold, Bryers, Frank, Goldberg, Hand, Hansen, Koshier, Kream, Lalande, Lefrançois, Lurie, Radolf, Rossomando, Rowe, J. Tanzer, M. Tanzer, Tspouras, and Upholt

*Associate Professors:* P. Epstein, Dealy, Gronowicz, Helfand, Hurley, Lichtler, Mina, and Pilbeam

*Assistant Professors:* Delaney, B. Oliver, Reichenberger, and Rogina

This program provides students with interdisciplinary research training in the areas of skeletal, craniofacial, and oral biology, emphasizing contemporary research technologies in cell, molecular, and developmental biology, genetics, and biochemistry. Trainees may enter a Ph.D. Program, a dual D.M.D./Ph.D or M.D./Ph.D, or a combined Dental Residency/Ph.D. Program. Thus the Program prepares trainees for academic or industrial careers in the basic biomedical sciences, or for academic careers in Medicine or Dental Medicine. Areas of research include regulation of the formation, outgrowth, and patterning of the developing limb; control of cartilage differentiation, endochondral ossification, osteogenesis, and joint formation; molecular regulation of gene expression in bone; homeobox gene regulation of osteoblast differentiation; gene therapy of bone diseases; hormonal and cytokine regulation of bone growth, formation, and remodeling; control of craniofacial skeletogenesis and tooth development; biochemistry, function, and regulation of the extracellular matrix; signal transduction and intracellular signaling pathways; cellular and molecular aspects of the pathogenesis of inflammatory disease; microbiology, pathogenesis, and immunology of caries and periodontal disease; neural structure and function in the gustatory system; biomaterial development for tissue engineering; bone cell/implant interactions; and, analysis of oral and mucosal function and disease.

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**Dual M.D./Ph.D. Degree Program.** This program leads to the awarding of dual degrees, the M.D. and the Ph.D. It is designed for a small number of outstanding students who have clearly defined career goals of research and teaching in the general



area of the biological and biomedical sciences and who have the motivation and the ability to pursue a rigorous training program in this area. The program provides basic science and research training as well as the standard medical curriculum, and is designed to produce individuals likely to make important contributions to the solution of problems of significance to the health sciences. The overall program is administered by the Committee on Graduate Programs at the University of Connecticut Health Center. The student applies as a Dual Degree applicant. The Steering Committee of the Dual Degree Program operating in conjunction with the admissions committee of the School of Medicine, reviews the application and admits the student. The student normally completes the program, including the dissertation, in a period of approximately seven academic years, including summers. Assistantship support is provided to highly qualified individuals.

## COURSES OF STUDY

**Medical School Courses.** These courses are offered by the Schools of Medicine and Dental Medicine and are open to qualified graduate students only. Permission from the Course Directors and the Dean for Academic Affairs (Dr. Bruce Koeppen) is required in writing in order to register. The syllabus will not be distributed to any student who does not have written permission. Forms are available in the Graduate School Office, Room LM035.

### MEDS 306. Physiological Digital Imaging

A combination lecture/seminar/project course in *Foundations of Imaging Science*. It covers the principal mechanisms of physiological imaging in digital applications and focuses on critical analysis of the performance of modern imaging sensors, modeling and measuring of visual perception parameters for image information and optimizing of digital imaging for the life sciences, pathology and radiology, including teleradiology. The course is intended for anyone who works with or will use digital images.  
*3 credits, Lecture. Instructor consent required.*

### MEDS 307. Critical Analysis of the Biological Literature

This course is intended to develop and improve each student's capacity for critical analysis of research articles, with special emphasis on the logic used to frame hypotheses and justify conclusions. An understanding of experimental methods will also be emphasized. Each week one or two papers, across a wide spectrum of modern biomedical research, will be discussed in depth in a small group format.  
*2 credits, Seminar.*

### MEDS 308. The Nature of Evidence in Scientific Research

This course will examine the aspects of the scientific process that are common to all levels of biomedical investigations: from biophysics in

cell-free systems to molecular biology in cells, to physiology in whole organisms, to epidemiology and clinical investigation in humans. These features begin with enunciation of the question to be asked, and include (1) Identification of a system to address the question, (2) Specification of the systems and their manipulation, (3) Assessment of outcomes, and (4) Drawing inferences on the basis of results. The course will be designed as a discussion of seminal, published works on the topics. Two to three key papers will be distributed to participants at least one week before the scheduled discussions. There will be no examination for the course. Students are expected to actively participate in critical evaluation and discussion during each of the weekly two-hour sessions. Evaluation of performances will be based solely on such participation.  
*2 credits, Discussion.*

### MEDS 309. Molecular Basis of Disease

This is a seminar and discussion based course that reviews the molecular understanding of human disease.  
*2 credits, Discussion. Prerequisite: MEDS 350 and MEDS 365.*

### †MEDS 310. Responsible Conduct in Research

This course introduces the student to ethical and legal issues associated with the practice and reporting of science. The course uses a case study approach and requires in-class student participation.  
*1 credit, Discussion.*

### MEDS 322. Developmental Biology

Signaling pathways mediated by the Wnt and Hedgehog proteins and tyrosine kinases play many important roles in development. They are involved in processes such as embryonic induction, determination of cell polarity, specification of cell fate and patterning, and their signaling mechanisms and function are conserved from worms to man. In this course we will discuss our current understanding of the signaling mechanisms used by these molecules and their roles in regulation of various developmental processes using examples from *C. elegans*, *Drosophila*, *Xenopus*, and mouse.  
*3 credits, Lecture.*

### MEDS 323. Current Topics in Developmental Biology

Reading and discussion of current research in the field of developmental biology with emphasis on molecular aspects. Periodic presentation of research papers and active discussion will be expected of all participants.  
*1 credit, Seminar.*

### MEDS 325. Practical Applications of Sequence Analysis

Provides an understanding of how to analyze genetic sequence information by computer.

Includes basic analyses such as restriction mapping and detection of coding sequences, to more advanced analyses such as sequence similarity searching, sequence comparisons and multi-sequence alignment, prediction of functional motifs from primary sequence information, and current tools for mapping, assembly, and analysis of genomic sequence information. The course emphasizes NCBI and other Web-based tools currently available for use. Students will be exposed to the Genetic Computer Group (GCG) series of sequence analysis programs, but these are not emphasized. Students are required to complete a series of computer-based exercises to demonstrate proficiency in the application and use of the various computer programs presented in class.  
*2 credits, Lecture. Instructor consent required.*

### MEDS 329. Immunobiology I

An overview of basic concepts in immunology including antibody structure, function and production, molecular genetics of the immune system and cellular regulation of immunity.  
*2 credits, Lecture.*

### MEDS 330. Immunobiology II

This continuation of MEDS 329 will consider effect or mechanisms of the immune system in inflammation, hypersensitivity, transplantation and autoimmunity as well as regulation of the immune system by cells, cellular products and chemical or physical agents.  
*2 credits, Lecture. Prerequisite: MEDS 329.*

### MEDS 333. Immunobiology of Transplantation

Immunogenetics of transplantation, alloantigen reaction lymphocytes, afferent recognition phase of transplantation immunity, cellular effector mechanisms and antibody participation in transplant immunity.  
*2 credits, Lecture. Instructor consent required.*

### MEDS 335. Advanced Molecular and Cellular Immunology I.

Major areas covered include: (1) Development of the immune system with respect to lymphoid organs and lymphocyte subsets; (2) Mechanisms of antigen processing and presentation; (3) Lymphocyte activation including the role of costimulatory molecules and (4) Regulation of the immune response including tolerance induction, cytokine interactions and signal transduction.  
*4 credits, Lecture. Instructor consent required. Prerequisite: MEDS 329 and 330.*

### MEDS 336. Advanced Molecular and Cellular Immunology II.

Major areas covered include: (1) Immunoglobulin genetics and structure; (2) T cell receptor genetics and structure; (3) Molecular nature of antigen recognition by T cell receptor; (4) Structure, function and molecular genetics of lymphocyte accessory molecules; (5) Mecha-

nisms of cytolysis and (6) Complement and complement receptors.

*4 credits, Lecture. Instructor consent required. Prerequisite: MEDS 329 and 330.*

#### **MEDS 337. Immunopathology**

The immediate-type hypersensitivities will be considered, with special emphasis on anaphylactic-type responses, pathologic responses, pathologic responses to immunologic complexes, immunohematologic diseases and models such as virus immunopathology, and rheumatoid arthritis and systemic lupus erythematosus.

*3 credits, Lecture.*

#### **MEDS 341. Molecular Neurobiology of Excitable Membranes**

Emphasizes the relation between structure and function of biological interfaces that comprise electrically excitable and chemically excitable (synaptic) membranes. Models of electrically-and chemically-induced regulation of ion movement via channels and transporters are examined. Genetic manipulation of channel composition is evaluated with attention to altered function and inferences about their structure.

*3 credits, Lecture. Instructor consent required.*

#### **MEDS 346. Cyclic Nucleotide Metabolism - Second Messenger and Signal Transduction**

Reviews second messenger systems involved in receptor mediated signal transduction, including cyclic nucleotides, calcium, inositoltrisphosphate and tyrosine kinases. Proteins involved in signal transduction such as G proteins are also covered. Emphasis is mostly on cyclic nucleotides, with an examination of the enzymes which metabolize them (cyclases, phosphodiesterases), as well as those which mediate their actions (protein kinases).

*2 credits, Lecture.*

#### **MEDS 349. Principles of Pharmacology**

An introductory course covering the basic principles of Pharmacology. Introduces the student to the concept that drugs and chemicals act on the body by binding to receptors. The physico-chemical properties of ligand-binding to macromolecules is examined, followed by an examination of the nature of receptors and the mechanisms whereby they exert their physiological responses to pharmacological agents. The uptake and fate of xenobiotics (compounds foreign to the body) in the body is discussed. The responses to chemicals, as therapeutic agents, i.e., the desired correction of diseased conditions, as well as toxins, carcinogens and teratogens. The mechanisms governing these different responses are examined in detail.

*1 - 3 credits, Lecture.*

#### **MEDS 350. Biochemistry I**

Introductory biochemistry of protein structure, function and synthesis, enzymology, structure and replication of nucleic acids, membrane

structure and function.

*4 credits, Lecture.*

#### **MEDS 351. Biochemistry II**

This course covers fundamentals of biomolecular interactions and protein structure. Additionally, the course covers the structure/function of select proteins and enzymes essential to the following: metabolic pathways, DNA/RNA transactions, gene expression, cell cycle and signal transduction, and the cytoskeleton.

*3 credits, Lecture.*

#### **MEDS 365. Genetics**

Introduction to the principles and practices of molecular genetics of prokaryotes and eukaryotes. Topics include gene structure and function; gene transfer and recombination; gene regulation; molecular genetics of eukaryotic viruses, yeast, *Drosophila*, somatic cells and humans.

*3 credits, Lecture.*

#### **†MEDS 367. Introduction to Molecular Biology and Biochemistry**

This course involves reading and discussing classic papers in Molecular Biology and Biochemistry in order to introduce first year students to the field and to develop critical skills. Topics will vary from year to year but may include nature of the gene, basic principles of transcription, translation, DNA replication, and membrane structure.

*1 credit, Lecture. Instructor consent required.*

*Open only to students enrolled in the Biomedical Science doctoral program.*

#### **†MEDS 368. Topics in Biochemistry and Molecular Biology**

To be offered every semester by a different faculty member on a rotating basis. Topic to be determined by individual faculty member. The purpose of the course will be to discuss and critically evaluate relevant literature in each topic. The topics will include viral replication strategies, membrane molecular biology, growth factors and second messengers, molecular biology of microbial development, membrane receptors, extracellular matrix-cell interactions, and peptide hormones.

*1 credit, Lecture.*

#### **MEDS 369. Advanced Genetics and Molecular Biology**

An advanced course emphasizing approaches to the genetic analysis of eukaryotic systems including yeast, fungi, *Drosophila*, mice, and humans. Topics include genome organization, DNA replication, regulation of gene expression, development, and differentiation.

*3 credits, Lecture.*

#### **MEDS 370. Introductory Neuroscience**

This course will provide an introduction to neuroscience as a discipline and the important concepts and problems that make the nervous

system unique. The nervous system consists of the brain, spinal cord, and peripheral nervous structures. Our scientific understanding of sensation, movement, emotional behavior, homeostatic systems, and cognition each require knowledge and understanding of the nervous system. This course will provide the student with an introduction to the neurobiological bases of these behaviors and the experimental approaches that underlie modern neurobiological research. The course will also introduce the student to the unique cell and molecular biology of the nervous system. Neuroscience, as a discipline, incorporates data from many other scientific fields to address fundamental problems. Therefore, one goal of the course is to show how our understanding of the nervous system requires the integration of data from disciplines like endocrinology, genetics, computation biology, engineering, and biophysics. In addition, this course will introduce common diseases of the nervous system. Diseases are instructional since dysfunction may help explain normal function. More important though is that the cure of diseases, such as stroke, Alzheimers disease, and multiple sclerosis, provide a strong motivation for research in the nervous system.

*1 credit, Lecture. Instructor consent required.*

#### **MEDS 371. Systems Neuroscience**

Part of the core series in the Neuroscience graduate program. This course will address the functional organization of neural systems underlying sensation, movement, language, learning/plasticity, and emotion/arousal. Sensory systems will include the somatosensory, auditory, visual, vestibular, and chemosensory systems. Motor systems will include the spinal cord, brain stem, cerebellum, vestibular system, oculometer system, basal ganglia and cerebral cortex.

*2 credits, Lecture. Instructor consent required.*

*Prerequisite: MEDS 370.*

#### **MEDS 372. Neuroscience: Cellular and Molecular Neuroscience**

Part of a core series in the Neuroscience Program, this course provides an introduction to basic concepts in the study of cell biology, neuroanatomy, neurophysiology, neurochemistry, and molecular biology of the nervous system.

*2 credits, Lecture. Instructor consent required.*

#### **MEDS 374. Neuroscience: Structure, Function, and Development of the Nervous System**

Provides systematic coverage of neuroanatomy, neurophysiology, neuropathology, neurochemistry and developmental neurobiology (including embryology and neural plasticity). Introduction to neuroendocrinology, degeneration and regeneration, communicative sciences (speech, hearing, chemical senses, and psychophysics),

and research methods.

*1 – 6 credits, Lecture. Instructor consent required. Prerequisites: MEDS 372 and 373.*

**MEDS 375. Neuroscience: Current Research Topics**

Review and critique of selected articles from the research literature. Specific topics are selected from each of the following areas; molecular neurobiology, cellular neurobiology, neurochemistry, neuroimmunology, electrophysiology, neuropharmacology, sensory neurobiology, and behavioral and cognitive neuroscience. Students will present oral reports on current literature and participate in discussion.

*1 credit, Seminar. Instructor consent required.*

**MEDS 376. Developmental Neurobiology**

Emphasis on the cellular and molecular mechanisms which underlie the development of the nervous system. Reading and discussion of research papers in the literature is stressed.

*2 credits, Lecture. Prerequisite: MEDS 350.*

**MEDS 377. Neurobiology of Hearing**

Provides in-depth analysis (using the Auditory System as a model system) with application of interdisciplinary approaches of cell and molecular biology, developmental neurobiology, neuroanatomy, neurophysiology/biophysics, neurochemistry, neural modeling, psychophysics, and plasticity, with state-of-the-art methods used in neuroscience research today. The team of faculty members contribute a variety of complementary fields of study.

*3 credits, Lecture. Instructor consent required.*

**MEDS 378. Computational Neuroscience**

Students study the function of single neurons and neural systems by the use of simulations on a computer. The course will combine lectures and classroom discussions with conducting computer simulations. The simulations will include exercises and a term project. Each student will complete a term project of neural simulation to be developed during the second half of the semester. The topic of the term project should be approved by the instructors by the middle of the semester. The grade will be based on the exercises and the term project. Course includes: analysis of electrical circuits modeling neuronal cell membrane and the related differential equations; the Hodgkin-Huxley model of voltage- and time-dependent sodium and potassium conductances in the squid axon; voltage-clamp and current-clamp; the relationship between two rate constants versus the steady-state value and time constant underlying each conductance; neuronal response properties that are related to voltage-dependent and calcium-dependent ion channels; single- and multi-compartment models with ionic conductances simulating specific neuronal response properties described in the literature; excitatory and inhibitory postsynaptic currents and underlying ligand-gated ion channels; dendritic

electrotonus and synaptic integration; temporal and spatial interactions of synaptic inputs to the dendritic tree and the cell body; action potential propagation in axons; neural circuits.

*3 credits, Lecture. Instructor consent required.*

**MEDS 380. Cell Biology**

Basic eucaryotic cell biology. Major topics include: Methods in Cell Biology; Cell Growth and Proliferation; Cytoskeleton; Transport: Hormone Response; Cytoplasmic Organelles and Membrane Structure, Function, Biogenesis, Transport and Sorting; Cell Motility; Chromatin Structure and Organization; and Extracellular Matrix and Cell Adhesion.

*4 credits, Lecture. Prerequisite: MEDS 350.*

**MEDS 381. Cell Biology and Physiology II**

Part I: Lecture format on membrane biophysics (membrane structure and permeability, electrical properties and gated channels, concentration gradients, volume and shape control, energy transduction, membrane dynamics). Part II: Lecture/Seminar format. Topics in receptors and channels, cell biology of the senses, cell junctions in the nervous system, growth factors and cell activation, cell cytoskeleton and matrix. Emphasis on in-depth discussions of specific cell systems through current literature. Final paper required in the form of research proposal.

*4 credits, Lecture. Prerequisite: MEDS 380.*

**MEDS 382. Molecular Mechanisms of Signal Transduction**

Intracellular signaling is one of the most rapidly advancing fields in cell biology. The objective of this course is to introduce to the students the most recent achievements in the field of intracellular signaling and regulation. Each of the participating faculty members will give an introductory lecture to provide an overview of signaling events in their field of expertise and discuss the most important recent papers.

*2 credits, Lecture.*

**MEDS 384. Mammalian Neuroanatomy**

The Mammalian Neuroanatomy course offers the opportunity to learn the mammalian spinal cord and brain and to explore the relationship of structure and function in the nervous system. It is intended to complement courses that cover integrative, functional systems, and cognitive neuroscience. Using an informal, small-group, laboratory-based format, students will undertake an extensive analysis of histological cross sections of the central nervous system to learn to correlate brain and neuron structure with the function of neural systems. Students will explore the entire central nervous system in the human and the rat. Readings and discussions will address how structural information is obtained from the intact nervous system at sub-cellular, cellular, or tissue levels, and the students will learn how this information is applied to the analysis of neural systems. Additional activities will include dissection of the spinal cord and

brain and the analysis of the human brain in magnetic resonance images (MRI) and computerized axial tomography (CAT) scans.

*2 credits, Lecture. Prerequisites: MEDS 370 and MEDS 371.*

**MEDS 385. Advanced Molecular Neuroendocrinology**

This course is a special topics discussion in current "hot topics" in cell and molecular endocrinology and neuroscience. The underlying theme is that the underlying biochemical and molecular events in many endocrine and neurobiological processes are unfolding, often raising more interesting new avenues of research as one area becomes clarified. The course will include studies of lower vertebrates and invertebrates, genetic approaches, a wide variety of molecular and biochemical techniques, as well as some electrophysiology and anatomical mapping as appropriate.

*3 credits, Lecture.*

**MEDS 388. Principles and Techniques of Biological Electron Microscopy**

A lecture/laboratory course on the theory and practice of transmission and scanning electron microscopy as applied in the biological sciences. Topics include instrument design and operation, electron optics, specimen preparation, photography, microscopic image interpretation and special techniques. Laboratory students learn and carry out commonly used preparative techniques, observe and photograph specimens in the electron microscope, and complete an independent project.

*1 – 4 credits, Lecture. Instructor consent required.*

**MEDS 391. Enzymes of Xenobiotic Biotransformation**

Lectures and student presentations of journal articles relevant to the lectures plus one laboratory. Topics include an overview of metabolic routes of drugs and chemicals in the body with an emphasis on the hepatic cytochrome P450 monooxygenases. Other topics include conjugative xenobiotic metabolizing enzymes.

*2 credits, Lecture. Instructor consent required.*

**MEDS 395. Independent Study**

*1 – 6 credits, Independent Study.*

**MEDS 400. Human Biology**

Introduces the histology of the major types of tissues and cellular ultrastructure. Following this introductory material, the students will dissect the limbs, and study epithelia, connective tissue, and skin including the extracellular matrix and body fluid compartments. The course will also cover muscle, bone, peripheral nerves, the neuromuscular junction, blood vessels, and other elements essential to understanding the function of the limbs. For all tissues considered, there will be an integrated presentation of structure,



biochemistry, and physiology. Also, presents the general principles of biochemistry and molecular biology. Fundamental processes involved in cellular growth and division are included as well as an overview of metabolism and energy production. This is followed by consideration of cellular differentiation. Finally, there will be a survey of the general principles of immunology and the lymphoid tissues including the function of blood cells and coagulation.  
*1 – 9 credits, Lecture.*

#### **MEDS 401. Organ Systems I**

Presents, in an integrated fashion, the anatomy, histology, biochemistry, and physiology of the central nervous system. Concurrently, the students dissect the head and the neck.  
*1–9 credits, Lecture. Instructor consent required.*

#### **MEDS 402. Organ Systems II**

Presents, in an integrated fashion, the anatomy, histology, biochemistry, and physiology of the cardiovascular, respiratory and renal-urinary systems. The emphasis is placed on how these organ systems interact and work together to maintain homeostasis. Concurrently, the students dissect the thorax. Introductory biostatistics and epidemiology are also presented at this time.  
*1 – 9 credits, Lecture. Instructor consent required.*

#### **MEDS 403. Organ Systems III**

Presents, in an integrated fashion, the anatomy, histology, biochemistry and physiology of the gastrointestinal, endocrine and reproductive systems. Also presented is material related to principles of human genetics. At the same time, students dissect the abdomen and pelvis.  
*1 – 9 credits, Lecture. Instructor consent required.*

#### **MEDS 404. Correlated Medical Problem Solving - Part A**

This course serves to expand upon and integrate basic science concepts introduced in the Human Systems.  
*2 credits, Lecture. Instructor consent required.*

#### **MEDS 405. Correlated Medical Problem Solving - Part B**

Expands upon and integrates basic science concepts introduced in the Human Systems course.  
*2 credits, Lecture. Instructor consent required.*

#### **MEDS 406. Human Development and Health**

This 170-hour course comprises (a) a multidisciplinary scientific survey of biological, psychological, and social development from conception to death; (b) an investigation of the behavioral and social dimensions of health and illness; (c) an introduction to principles of medical law and ethics applied to doctor-patient relationships and health care problems; and (d) an overview of the structure, function, and services of the American health care system and

the political and economic forces shaping its evolution.

*1 – 9 credits, Lecture.*

#### **MEDS 407. Mechanisms of Disease: Part A**

General pathology, pharmacology and infectious disease.

*1 – 9 credits, Lecture. Instructor consent required.*

#### **MEDS 408. Mechanisms of Disease: Part B**

Diseases affecting homeostatis.

*1 – 9 credits, Lecture. Instructor consent required.*

#### **MEDS 409. Mechanisms of Disease: Part C**

Medicine. Oncology, metabolism, endocrinology, and the nervous system.

*1 – 9 credits, Lecture. Instructor consent required.*

#### **MEDS 410. Mechanisms of Disease: Part D**

Reproduction, immunology, and connective tissue.

*1 – 9 credits, Lecture. Instructor consent required.*

#### **MEDS 411. Clinical Practicum**

Clinical experience in the major disciplines including: Medicine, Surgery, Obstetrics and Gynecology, Psychiatry, Family Medicine, and Pediatrics.

*12 credits, Practicum. Instructor consent required.*

#### **†MEDS 412. Advanced Clinical Practicum**

Advanced clinical work with opportunities in the major clinical disciplines.

*11 credits, Practicum. Instructor consent required.*

#### **MEDS 413. Cancer Biology**

This is a survey course to explore the genetics and pathobiology of cancer by focusing on a variety of current research topics. Understanding the disease process requires studying normal mechanisms of growth control. Emphasis will be on topics such as differentiation, apoptosis, growth factors, oncogenes, tumor suppressor genes, viruses and signal transduction.

*2 credits, Lecture. Prerequisite: MEDS 350 and MEDS380.*

#### **†MEDS 414. Advanced Correlated Medical Problem Solving - Part A**

Expands upon and integrates basic science concepts introduced in Human Development and Health and Mechanisms of Disease.

*2 credits, Lecture.*

#### **†MEDS 417. Advanced Correlated Medical Problem Solving - Part B**

Expands upon and integrates basic science concepts introduced in Human Development and Health and Mechanisms of Disease.

*2 credits, Lecture. Instructor consent required.*

#### **†MEDS 418. Classic Papers in Molecular Biology and Biochemistry**

Students are required to read and critically analyze one or two papers selected by the instructor each week.

*1 credit, Lecture.*

#### **†MEDS 419. Classic Papers in Neuroscience and Immunology**

Students are required to read and critically analyze one or two papers selected by the instructor each week.

*1 credit, Lecture.*

#### **MEDS 421. Classic Papers in Cell Biology and Developmental Biology**

Students are required to read and critically analyze one or two papers selected by the instructor each week.

*1 – 6 credits, Lecture.*

#### **MEDS 422. Classic Papers in Cellular and Molecular Pharmacology**

Students are required to read and critically analyze one or two papers selected by the instructor each week.

*1 credit, Lecture.*

#### **MEDS 423. Cellular and Molecular Biology of the Vascular System**

Systematic survey of classic and current literature in vascular biology, emphasizing the molecular and cellular basis of the development, function, and malfunction of the vascular system.

*2 credits, Lecture.*

#### **MEDS 424. Neuropharmacology**

Highlights the different neurotransmitter and neuromodulator systems and the pharmacological agents that affect them. Emphasis is placed on the mechanisms of drug action in the treatment of nervous system and mental disease, serving to complement other courses in neuroscience, pharmacology, immunology, and pharmaceutical science.

*2 credits, Lecture.*

#### **MEDS 425. Neuroimmune Interactions**

Addresses the chemical and physical relationships between the immune system and the nervous system and emphasizes the coordinate operations of the two systems.

*2 credits, Lecture.*

#### **MEDS 438. Craniofacial Growth and Development**

Part of a core series in the postgraduate program of orthodontics. Provides systematic coverage of basics in growth and development of the human face. Review and critique of selected articles from the research literature of the following areas: Physiology of facial growth, theories in growth mechanisms, pre- and postnatal growth of the face, normal and abnormal courses of the facial growth.

*2 credits, Lecture. Instructor consent required.*

**MEDS 439. Craniofacial Growth and Development**

2 credits, Lecture. Instructor consent required.

**MEDS 444. Fundamental Microbiology**

Provides first and second year graduate students with a broad understanding of contemporary topics in bacteriology and virology. Although the course centers primarily around the more basic aspects of these two disciplines, the outline also includes sessions intended to relate this basic material to important issues in pathogenesis of bacterial and viral diseases.

3 credits, Lecture.

**MEDS 445. Skeletal Biology**

A comprehensive survey of the cellular and molecular mechanisms that regulate the development, growth, differentiation, remodeling, and repair of the skeletal system.

3 credits, Lecture. Instructor consent required.

**MEDS 447. Presentation of Scientific Data**

Through a series of lectures and workshops, this course is designed to improve the ability of students to present scientific data in written and oral format. These skills are essential, not only as a graduate student, but in future careers as scientist. The curriculum covers basic elements and logical order of presentations. Reviewer's perspectives, grant writing resources, workshops, and evaluation of recent seminars help students to design and evaluate research projects.

1 credit, Discussion. Instructor consent required.

**DENT 453. Basic Radiation Sciences I: Radiation Physics and Molecular and Cellular Radiation Biology**

Lecture/seminar course examining the nature and production of radiations, their interactions with matter and their effects on molecular and cellular structure, function and proliferation.

2 credits, Lecture. Instructor consent required.

**DENT 454. Basic Radiation Sciences II: Tissue, Organ and Organismic Radiation Biology**

Seminar course in which the effects of ionizing radiation on tissue and organ systems, whole organisms and genetic integrity as well as the induction of cancer, will be examined.

2 credits, Lecture. Instructor consent required.

**MEDS 471. Physiological Systems I**

Designed for engineers or other graduate students without a life sciences background. Contents: introduction to cell structure and function; the cardiovascular, respiratory, and renal/urinary systems; the basics of hematology, and the interactions between these organ systems to transport oxygen and eliminate wastes. Format: didactic session followed by group problem-solving. Course grade will be determined by level of participation in the

problem-solving session and by two take-home problem-solving exams. This course is available to all students involved in the BEACON (Biomedical Engineering Alliance for Central Connecticut) program

3 credits, Lecture. Instructor consent required. Also offered as BME 310.

**MEDS 472. Physiological Systems II.**

A problem based learning course that focuses on in-depth coverage of four human organ systems with an engineering perspective. An extensive literature review is required for each topic which culminates in a major report that highlights the engineering standpoint unified mathematically. Case studies are used to develop each topic.

Format: didactic session followed by group problem solving.

3 credits, Lecture. Instructor consent required.

Prerequisite: MEDS 471 or BME 310 or consent of instructor. Also offered as BME 318.

**MEDS 479. Chemistry and Biology of Drugs of Abuse**

An in-depth interdisciplinary approach to the neurobiology of drug abuse, integrating basic and clinical sciences. Lectures, student presentations of original research reports, and laboratory exercises dealing with methods to measure neurotransmitter transport, ligand binding to receptors and transmitter action on ligand-activated channels.

5 credits, Lecture.

**MEDS 495. Independent Study**

A reading course for those wishing to pursue special topics in the biomedical sciences under faculty supervision.

1 - 6 credits, Independent Study.

**MEDS 496. Laboratory Rotation**

1 - 6 credits, Laboratory.

**MEDS 497. Graduate Seminar**

Reading and discussion of recent research developments in various areas of biomedical science.

1 - 6 credits, Seminar.

**†GRAD 495. Doctoral Dissertation Research**

1 - 9 credits.

**†GRAD 496. Full-Time Doctoral Research**

3 credits.

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

3 credits.

**GRAD 498. Special Readings (Doctoral)**

Non-credit.

**GRAD 499. Dissertation Preparation**

Non-credit.

## BIOTECHNOLOGY

Biotechnology is the high technology field that applies basic knowledge in biology and materials of biological origin to the development of products and processes with practical applications. Although the basis of biotechnology is in molecular biology, its practice is highly interdisciplinary. Chemists and chemical engineers play essential roles in the design and development of processes, and applications are developed by workers in medicine, agriculture, pharmaceutical science, environmental science, and other fields.

**The M.S. Program.** The Master of Science degree in Biotechnology is directed by an interdisciplinary graduate faculty from the College of Agriculture and Natural Resources, the College of Liberal Arts and Sciences, the School of Engineering, and the School of Pharmacy, and is administered in the Department of Molecular and Cell Biology. The program stresses both theory and current laboratory practice in molecular biology and other central areas of biotechnology. Major use is made of the core laboratory research facilities of the University of Connecticut Biotechnology Center. The Biotechnology M.S. is Plan B, based on course work; although students complete a substantial number of laboratory courses and spend a research period in a university or industrial laboratory, no research thesis is required. Students are prepared for challenging positions in industry and for entry into Ph.D. programs.

Entering students' undergraduate training should be in science, with biology, chemistry, and chemical engineering especially appropriate. A complete description of the program with recommended preparation and instructions for applying may be obtained from Dr. Robert T. Vinopal, Department of Molecular and Cell Biology, Unit 3044, Storrs, Connecticut 06269-3044. Telephone: (860) 486-4886. E-mail: vinopal@uconnvm.uconn.edu

## BUSINESS ADMINISTRATION

*Interim Dean:* C. F. Sirmans  
*Associate Deans:* Jeffrey Rummel and Richard N. Dino  
*Director, M.B.A. Program:* Lane Barrow  
*Director, Executive M.B.A. Program:* Afshin Ghiaei  
*Director, M.S. in Accounting Program:* Andrew J. Rosman  
*Director, Ph.D. Program:* John E. Mathieu  
*Professors:* Biggs, Cann, Carrafiello, J. Clapp, K. Fox, Garfinkel, Ghosh, Giaccotto, Gutteridge, Hegde, Hussein, S. Jain, Kochanek, Lubatkin, Marsden, Mathieu, Nair, O'Brien, Powell, Ratneshwar, Scott, Sewall, Sirmans, Tucker, and Veiga  
*Associate Professors:* Coulter, Dechant, Diaby, Dino, Dolde, Floyd, Goes, Gopal, Gupta, Hoskin, Klein, LaPlaca, Nunn, Palmer, Punj, Rosman, Rummel, Seow, Spiggle, Srinivasan, Thakur, and Willenborg  
*Assistant Professors:* Beliveau, Dunbar, Earley, Gilson, Goodman, Harding, Martins, Phillips, and Rich

The School of Business offers course work and research leading to the degrees of Master of Business Administration (M.B.A.), Master of Science in the field of Accounting, and to the Ph.D. in Business Administration. Detailed descriptions of these programs (as well as the Executive M.B.A.) can be found in brochures available from the School of Business.

### The Ph.D. Program

The Ph.D. Program prepares students to conduct state-of-the-art research and to take faculty positions in business schools at leading universities and research positions in government and industry. Students select an area of concentration from the following: accounting, finance, management, marketing or operations and information management. The program emphasizes: (1) student/faculty interaction; (2) flexibility in designing a program to meet individual needs; and (3) timely completion of the degree.

**Degree Requirements.** The Ph.D. program has four major components: Course work, qualifying research paper, written general qualifying examination, and dissertation. While specific course work will vary depending upon the student's area of concentration (students should confer with their major advisors to obtain specific information), all students must complete a minimum of 37 credits in the following categories: Orientation (1 credit), research methods (9 credits), major area of concentration (12 credits), and supporting courses (15 credits). Students concentrating in Marketing must complete a minimum of 40 credits while those in Accounting must complete a minimum of 49. All courses must be at the graduate level and the twelve

credits in the major area typically are Ph.D. level seminars. Interdisciplinary courses are encouraged in the supporting electives. Completion of the qualifying research paper is required by the end of the second year. The general qualifying examination is administered by the faculty in the student's area of concentration. The dissertation is the final requirement.

**Admission.** Admission to the Ph.D. program is based upon the applicant's potential to conduct research and commitment to a rigorous program of study. Applicants must submit a score on the Graduate Management Admission Test. Students who have not previously acquired knowledge of the subject matter of the Common Body of Knowledge courses of the AACSB are expected to acquire that knowledge as part of their program. In addition, applicants should have satisfactorily completed one year of calculus. Letters of recommendation also are considered in the admission decision and a campus interview is desirable. International applicants must submit scores on the Test of English as a Foreign Language and Test of Spoken English.

**Special Facilities.** All doctoral students are assigned to offices equipped with personal computers with a full array of software, and ready access to laser printers. Students also have access to terminals connected to the University's mainframe computer. Data bases include Compustat, CRSP and other tapes routinely used in business research. The School of Business Administration also houses research centers that employ graduate students for collaborative research.

### The M.S. Program in Accounting

The Master of Science Program in the field of Accounting is an online degree which will provide students with the skill set critical to a successful professional career in public and private accounting. A dynamic online community has been created that supports and nurtures student-centered learning and information literacy, also known as "learning to learn". Information literacy is the process of identifying a problem and information sources, evaluating information to make a judgment, and then communicating that judgment. Student-centered learning shifts the focus for learning from the instructor to the student, with the instructor facilitating and guiding the learning experience. Both information literacy and student-centered learning produce individuals who can succeed in challenging work environments.

The online community allows students to readily access other students in the online class as well as pertinent faculty members. Completion of this program, combined with an undergraduate degree with at least 30 credit hours in business or economics other than accounting, will fulfill the 150-hour educational requirements in preparation for the CPA exam in most U.S. states.

Students can complete the degree in eight months on a full-time basis or within 16 months on a part-time basis. The part-time program provides a wide range

of summer course offerings minimizing the coursework taken during the fall semester.

The program offers two areas of emphasis for part-time students: reporting issues and assurance services and tax. The reporting issues and assurance services emphasis is the only choice for full-time students.

**Admission.** Admission is highly selective. General targets for admission are: a GMAT score of 550 (with a reasonable balance between verbal and quantitative scores), and an undergraduate grade point average of 3.2 on a 4.0 scale. In addition, applicants must have completed at least 24 semester hours of accounting courses and received a baccalaureate degree at a college or university accredited by a regional accounting commission subscribing to established national policies and procedures or of equivalent accreditation as determined by the Connecticut State Board of Accountancy. Students with fewer than 24 credits in accounting should contact the program director or manager to discuss acquiring the necessary background courses.

Applicants with significant work experience and applicants who add to the cultural and geographic diversity of the student body are encouraged to apply even if they do not possess typical GMAT scores or undergraduate grade-point averages.

Students enter the program in May of each year. Applications and all accompanying materials should be received as early as possible, since admissions decisions are made on a rolling basis until the entering class is filled. The deadline for submitting the application and all materials is March 1.

### The M.B.A. Program

The M.B.A. Program emphasizes the role of information technology and globalization across all functional disciplines. The curriculum requires a total of 19 courses (57 credits) to earn the degree. This typically takes two academic years to complete.

The M.B.A. Program requires a laptop computer as a tool of the trade, and the laptop's use is completely integrated into the curriculum.

The first-year M.B.A. curriculum during the fall semester consists of core introductory courses in managerial statistics, financial accounting and reporting, managing organizations, and management information systems. The spring semester consists of core introductory courses in financial management, operations management, cost analysis and control, and market-driven management.

As part of the first-year curriculum, students are grouped into functional teams. These teams undertake a comprehensive Integration Project which solves business problems faced by a partner company. As the term "integration" implies, students synthesize knowledge and skills from all first-year courses and past professional experiences to develop solutions. Recent projects include experiential learning with such firms as Pratt & Whitney, Xerox, Engineering Systems, and General Electric Capital Financial Services (GE Capital).

In the second year, students complete courses toward their chosen concentrations. Concentrations



enable M.B.A. candidates to explore areas of business in greater depth to prepare for specific careers. By March of their first year, full-time M.B.A. students are required to choose a primary concentration (in which the M.B.A. degree is to be awarded) and a secondary concentration. These concentrations are to be chosen from the five that have been designated for the full-time M.B.A. Program: Finance, Health Care Management, Information Technology, Interactive Marketing, and Management Consulting. Students are required to take four specific courses in their primary concentration and three courses in their secondary concentration.

Second-year students also benefit from a partnership with General Electric through which the School of Business operates a 10,000 square foot IT facility called *edgelab*. M.B.A. students participate in real-time IT/e-business research projects, mentored by faculty and by GE executives. By “pushing the envelope” of cooperative research and analysis, by employing student teams on substantive “live” projects, and by providing a creative, collaborative environment, *edgelab* is redefining the partnership between business and education at UConn.

**Admission.** All applicants must take the Graduate Management Admission Test (GMAT) and must meet the general requirements for admission to the Graduate School. Interviews may be requested by the M.B.A. admissions committee. Non-degree students are permitted, in exceptional cases, to register for a total of not more than 15 credits. They also are required to take the GMAT before enrolling in courses.

**Scholastic Standards.** Ordinarily, a student will not be permitted to continue in the M.B.A. program if he or she: receives two or more grades of *B-* or below with a cumulative average below 3.0 after completing four courses in the program, accumulates four grades of *B-* or below at any point in the program with a cumulative average below 3.0, or receives an *F* at any point in the program.

Under no circumstances will the M.B.A. degree be conferred if the student has a mark of Incomplete (*I*) or Absent (*X*) on his or her record even though the course may not be listed on the plan of study.

### The Executive M.B.A. Program

The objective of the Executive M.B.A. program is to provide experienced managers with the opportunity to broaden and update their managerial knowledge and skills. The program is designed for individuals with significant managerial experience. By using a Friday/Saturday format for classes, managers are able to retain their positions in their companies while pursuing graduate studies. Completion time is approximately 20 months. Class size is limited to provide a highly interactive classroom environment.

The program leads to the degree of Master of Business Administration. The School of Business at the University of Connecticut is accredited by the AACSB - The American Assembly of Collegiate Schools of Business. Admission takes place only once per year. Classes are held in two locations - Farmington and Stamford, Connecticut.

**Admission.** All applicants must take the Graduate Management Admission Test (GMAT) and must meet the general requirements for admission to the Graduate School. Interviews may be requested by the Executive M.B.A. Admissions Committee.

### Curricular Program for the Full-Time M.B.A. Degree

Students are required to complete the following general curricular program unless they enter the specialized M.B.A. program in health care management.

#### 57 Credit General Program

Candidates for the general M.B.A. degree are required to complete 57 credits of graduate study: 39 credits prescribed and 18 elective/breadth credits as follows:

Required Courses - 39 Credits:

- ACCT 321 - Financial Accounting and Reporting
- ACCT 323 - Cost Analysis and Control
- BLAW 375 - Business, Law, and Ethics in Modern Society
- FNCE 301 - Financial Management
- FNCE 317 - Economic Analysis for Business
- MGMT 338- Managing Organizations
- MGMT 390- Strategy, Policy, and Planning
- MKTG 315 - Market-Driven Management
- OPIM 303 - Managerial Statistics
- OPIM 310 - Operations Management
- OPIM 365 - Management Information Systems
- BADM 300 - Integration Project

In their second year, full-time M.B.A. students choose a primary concentration (in which the M.B.A. degree is to be awarded) and a secondary concentration. Concentrations include: Finance, Information Technology, Interactive Marketing, Management Consulting, and Health Care Management. The primary concentration consists of four courses and the secondary concentration consists of three courses.

Based upon prior preparation, substitution of up to 6 credits of required courses, other than MGMT 390, may be possible. Each student in the 57 credit general program is required to establish an area of emphasis consisting of at least six credits of course work beyond the required courses.

A college-level calculus course covering limits, functions, integration, and differentiation must have been completed at or prior to the time of admission to the M.B.A. program. Each student who transfers from another institution must earn a minimum of 42 credits of graduate work at the University of Connecticut.

**Health Care Management Concentration.** The M.B.A. with an area of concentration in Health Care Management is a 57-credit graduate program integrating the dynamics of a well-defined general business program with theoretical and applied studies specifically related to health care management processes. This program is offered in

cooperation with the Department of Community Medicine and Health Care at the University of Connecticut Health Center in Farmington. Students pursuing the M.B.A. in this area of concentration satisfy the general as well as the health care management curricular requirements.

The full-time program is offered only on the Storrs Campus. The part-time evening program is offered at the West Hartford, Stamford, and Waterbury Campuses. Individuals can then take their Health Systems electives at the West Hartford Campus. Within the general framework of the program, sufficient flexibility is provided to accommodate specific areas of sub-specialization and career interests. In addition to the normal M.B.A. curriculum requirements, individuals specializing in Health System Management will enroll in HSMG 380 - Introduction to Health Care Systems, HSMG 381 - Health Care Law and Regulation, HSMG 383 - Health Care Financial Management and HSMG 384 - Health Care Planning.

**Dual M.B.A. and J.D. Degree Program.** This program offers the student the opportunity to combine academic training in the fields of Business Administration and Law by combining into four years of study the three-year J.D. program offered by the School of Law and the two-year M.B.A. program offered by the Graduate School. Fifteen credits from the J.D. program are used to meet the M.B.A. requirements. Twelve credits from the M.B.A. program are used to satisfy the J.D. requirements. To be admitted to the joint M.B.A./J.D. program, a student must meet the admission requirements of both schools. For additional information, interested students should review the materials of the regular programs contained in the catalogs of the respective schools.

**Dual M.B.A. and M.D. Degree Program.** Rapid changes in the health care industry as well as the increasing size and complexity of health care organizations have created a demand for physicians who also are effective managers. The Doctor of Medicine program is offered at the University of Connecticut Health Center. Usually, students complete the first two years of study in the School of Medicine, enroll in the full-time M.B.A. program in Storrs for the third year, and then return to the Health Center to take electives in both the School of Medicine and the M.B.A. program in Hartford. M.D./M.B.A. students are required to complete 42 credits in the M.B.A. program. For more information, contact the Director of the Storrs M.B.A. program or the Office of Admissions, School of Medicine.

**Dual M.B.A. and M.S.W. Degree Program.** This program is designed for students who anticipate careers in the management and administration of social work services in either governmental or private agencies. Application to each school is made independently. Nine credits in the M.B.A. program are used to meet the M.S.W. requirements. Fifteen credits in the M.S.W. program are used to meet the M.B.A. degree requirements. Additional details are available from the Storrs M.B.A. Director and the School of Social Work.

**Dual M.B.A. and M.A. in International Studies Degree Program.** This program is designed for students interested in the management

of international organizations in African, Latin American and Caribbean, and European areas. Fifteen credits of course work in area studies in the School of Liberal Arts and Sciences are used to meet both M.B.A. and M.A. degree requirements. More details are available from the Directors of the Storrs M.B.A. Program, the Center for Contemporary African Studies, the Center for Latin American and Caribbean Studies or the Center for European Studies.

**Dual M.B.A. and M.S. in Nursing.** This dual degree program is available for students in the administrative track in the Nursing Program. The M.S. in Nursing usually includes a minimum of 39 credits. Fifteen credits of course work in the Nursing Program are used to meet both M.B.A. and M.S. degree requirements.

**Dual M.B.A. and M.I.M. Degree Program.** A two-year program, with one year in the University of Connecticut Graduate School and one year in France, permits the student to earn the University of Connecticut M.B.A. and the Master's In Management from the Ecole Supérieure de Commerce (ESC) de Lyon. Classes at ESC Lyon are taught in French.

**Continuous Registration for Degree Students.** All continuing M.B.A. students not registered for credit courses during the fall or spring semesters must register for **GRAD 398 Special Readings (Master's)**.

## COURSES OF STUDY

Well qualified non-degree students are admitted into M.B.A. courses only in very special cases and only if they have taken the GMAT.

### Accounting

#### ACCT 300. Special Topics in Accounting

Investigation and discussion of special topics in accounting.

*1 – 3 credits, Seminar.*

#### ACCT 303. Advanced Accounting

An in-depth study of accounting for business combinations. Coverage also is given to accounting for nonprofit entities and contemporary issues in financial accounting.

*3 credits, Lecture. Requisites: Prerequisite: ACCT 322. Not open to students who have passed ACCT 203.*

#### ACCT 304. Assurance Services

Issues relevant to the public accounting profession, such as legal liability and ethics, audit risk analysis, planning of audit engagements, audit reports, and other assurance services and reports. Students learn to think critically about issues facing the audit profession, primarily by analyzing cases and completing a number of individual and research group projects.

*3 credits, Lecture. Not open to students who have passed ACCT 243.*

#### ACCT 305. Understanding the Responsibilities of an Accounting Professional

The groundwork for three fundamental issues that are embedded throughout the curriculum in the M.S. in Accounting Program will be set. First, students will explore the foundations of the accounting professional ethics and ethical ideals in the conduct of a professional, the importance of an auditor in serving the public interest, the cultural significance of accounting, and the regulatory environment governing the accounting profession. Second, students will be exposed to the use of technology within the profession and learning environments. Third, they will apply the concept of information literacy to help ensure continued professional development throughout their careers as they develop the skill set to identify an information need, efficiently select information resources relevant to that need, effectively retrieve pertinent information from those relevant resources, astutely synthesize that information into a form that responds to their initial information need, and lastly, articulate the fit of that response as they seek to become critical users of a variety of information sources within the profession.

*3 credits, Seminar. Instructor consent required.*

*Open to students in the M.S. in Accounting program.*

#### ACCT 321. Financial Accounting and Reporting

Accounting is an information system. This course is designed to introduce students to accounting concepts essential to the preparation and interpretation of financial statements issued to management and to external users such as stockholders and creditors. While appropriate consideration is given to procedural aspects of accounting, more emphasis is placed on understanding the conceptual bases of generally accepted accounting principles and the effects of using alternative accounting methods on financial statements.

*3 credits, Lecture. Open to MBA and non-degree business students, others with permission.*

#### ACCT 322. Financial Accounting

Study of the financial accounting principles which determine financial statements and the uses of the financial statements. The course adopts a broad perspective to understanding major accounting concepts contained in the intermediate accounting curriculum. Emphasis is placed on financial statement presentation and the meaning of resulting balance sheet and income statement amounts.

*3 credits, Lecture. Prerequisite: ACCT 321.*

#### ACCT 323. Cost Analysis and Control

Internally, managers need timely information in order to plan and control operations. This course focuses on managerial uses of accounting information for decision-making within the

business enterprise. Decisions considered include product pricing, transfer pricing, make or buy, and capital budgeting. Formation of budgets establishing an internal control structure, performance evaluation, and cost control techniques are also discussed.

*3 credits, Lecture. Open to MBA students, others with permission. Prerequisite: ACCT 321.*

#### ACCT 325. The Federal Income Tax and Business Decisions

Designed for the business manager who wants an awareness of tax considerations involved in business decisions. It involves a symptom/recognition level of learning rather than a detailed analysis of each section of the law. The course involves an examination of the definition of income, evaluation of different business entities, methods of reporting income and deferral transactions. Students examine how slight changes in a transaction can materially alter the tax consequences. The course includes discussion of the social, economic, and political aspects of taxation as well as an opportunity to familiarize the student with tax research techniques.

*3 credits, Lecture. Prerequisite: ACCT 321.*

#### ACCT 331. Contemporary Financial Accounting Issues

Study of major financial accounting issues, including the conceptual framework of accounting, the standard-setting process, asset valuation, and income determination. Concentrates on developing theories of the usefulness of accounting information in financial markets. This theoretical perspective is used to evaluate the conceptual framework, specific accounting standards, and issues related to international harmonization of accounting standards.

*3 credits, Lecture.*

#### ACCT 333. Contemporary Managerial Accounting Issues

Study of major managerial accounting issues. Overall focus is on the use of internally generated accounting data to support business strategy and maintain competitive advantages. Current research in the constantly evolving area of managerial accounting is emphasized.

*3 credits, Lecture.*

#### ACCT 335. Global Financial Reporting and Analysis

Develops skills in analyzing and interpreting accounting information about multinational enterprises from both a preparer and user perspective. Special attention is given to the impact of examining accounting information on (1) culture and differences in measurement and disclosure practices across countries, (2) type of industry, (3) stage or maturity of business life cycle, and (4) form of business activity, such as joint ventures and strategic alliances.

*3 credits, Lecture.*

**ACCT 339. Financial Services Reporting and Analysis in the Financial Services Industry**

Introduces the nature of and accounting for financial services firms. The major emphasis is on insurance and banking. In each section of the course the student will learn about the nature of the business and the basic transactions in which the business engages. The unique accounting aspects of the businesses are discussed, including any special regulatory accounting rules. The analysis of firms in the industry will be covered.

*3 credits, Lecture.*

**ACCT 343. Advanced Assurance Services**

Advanced treatment of significant assurance services issues. Intended for students with previous coursework in assurance services and/or auditing. Emphasis is placed on: (1) planning and performing audits of financial information systems, (2) computer applications of auditing and assurance services, (3) statistical applications in auditing and assurance services, and (4) contemporary ethical and legal issues confronting the professional accounting environment.

*3 credits, Lecture.*

**ACCT 351. Systems Control and Risk Analysis**

This course focuses on the importance of well-designed internal controls for the prevention, detection, and correction of information processing errors and related fraudulent activities. The course provides a broad overview of information systems development and management along with a more detailed study of the specific control structures necessary to minimize the risk to information systems and their related accounting and business information.

*3 credits, Lecture.*

**ACCT 352. Enterprise Systems**

This course focuses on the impact of enterprise systems integration on traditional and contemporary business processes. This includes exploration of the technology that drives enterprise systems (such as enterprise resource planning (ERP) systems and e-business systems) and the resulting impact on organizational internal control structures.

*3 credits, Lecture.*

**ACCT 371. Taxation of Business Entities**

Application of basic tax concepts to business entities, with particular emphasis on C corporations, partnerships, and S corporations. At the end of the course, students should be able to identify and address the tax and non-tax issues faced when choosing operating, and liquidating a business entity.

*3 credits, Lecture.*

**ACCT 372. Research in Taxation**

Application-oriented tax research, which has the objective of determining the defensible correct tax treatment of a transaction based on the

existing law. Tax research is a process of two basic activities: (1) the conceptualizing process to decide what research is needed and then to evaluate any information located through tax research, and (2) the search process, which requires the ability to use the massive quantity of tax authority available in electronic format. Students further develop their communication skills, both oral and written.

*3 credits, Lecture.*

**ACCT 373. Advanced Corporate Taxation**

Focus is on topics relating to the taxation of corporations: taxable sales and acquisition of going concerns; tax-free reorganizations; multistate taxation; and international taxation of U.S. multinational corporations. The objective is to familiarize the student with the applicable tax rules. Students learn to identify applicable tax planning strategies and tax issues present in business decisions such as those involving the sale or acquisition of a going business, the location or expansion of operations, the repatriation of foreign earnings, and the setting of transfer prices for goods and services provided to related parties.

*3 credits, Lecture. Prerequisite: ACCT 371.*

*Accounting 372 preferred but not required.*

**ACCT 374. Advanced Individual Taxation**

Focus is on topics relating to taxation of individuals: estate and gift taxation; income taxation of estates and trusts; estate planning; compensation planning including, but not limited to, equity-based compensation; income taxation of and planning for high-income taxpayers, including taxation of investments and charitable planning. Students learn tax rules and tax planning strategies necessary for individuals to create, preserve, and transfer wealth to future generations.

*3 credits, Lecture. Prerequisite: ACCT 371.*

*Accounting 372 preferred but not required.*

**ACCT 380. Financial Planning for Accounting Professionals**

Designed for the accounting professional in the role of financial planner, this course covers all facets of a professional in financial planning practice. Topics include personal income tax planning, debt management, investment and retirement planning, risk management and insurance, and estate planning.

*3 credits, Lecture. Prerequisite: ACCT 371.*

*Accounting 372 preferred but not required.*

**ACCT 396. Independent Study in Accounting**

Faculty-student interaction on a one-to-one basis involving independent study of specific areas of accounting. Emphasis, selected by the student, may be on theoretical or applied aspects. A written report is required.

*1 – 6 credits, Independent Study. Instructor consent required.*

**ACCT 400. Investigation of Special Topics**

*1 – 3 credits, Lecture.*

**ACCT 401. Introduction to Accounting Research**

This seminar introduces students to three major elements of accounting research. First, students are introduced to philosophy of science and how that translates into the major research paradigms in accounting. Second, students are introduced to basic research design issues and how those issues are illustrated in the accounting literature. Finally, students are introduced to the major research paradigms in accounting.

*3 credits, Seminar. Instructor consent required.*

**ACCT 402. Seminar in Accounting Research II: Organizational Behavior**

Continuation of study in current research topics in accounting.

*3 credits, Seminar.*

**ACCT 403. Accounting and Capital Markets**

This seminar provides a broad survey of capital markets research in accounting and related fields. Students are introduced to major theoretical and methodological issues in this line of research. The seminar focuses on theoretical and intuitive constructs that frame accounting research questions and the methods that are used to address those research questions.

*3 credits, Seminar. Instructor consent required.*

**ACCT 404. Judgment and Decision Making in Accounting**

The seminar examines theories and empirical research related to individual judgment and decision making in accounting. Students are introduced to the major theoretical and methodological issues involved in this line of research, and develop the background for reading the literature and for further study.

*3 credits, Seminar. Instructor consent required.*

**ACCT 411. Seminar in Special Research Topics**

Students are exposed to a broad range of accounting research through reading and critiquing research papers presented at the Accounting Department Research Workshop (papers are presented by local scholars as well as scholars from other institutions). The seminar also focuses on how to present effective written and oral criticisms of research papers.

*1 credit, Seminar. Instructor consent required.*

**Business Administration****BADM 300. Special Topics**

*1 – 9 credits, Lecture. Open to M.B.A. students, others with permission.*

**BADM 401. Introduction to Research and Teaching**

This course introduces students to important dimensions of an academic career. The role and importance of research and teaching is stressed with emphasis on philosophy of science, as well



as appreciation of research in other business administration areas of concentration. Teaching methods and values in higher education are covered. Guest speakers discuss research in their areas. Practical aids such as how to write a research proposal and how to manage a dissertation are covered.

*1 credit, Lecture. Open to Ph.D. students in the School of Business only.*

## Business Law

### BLAW 300. Seminar

Investigation and discussion of special topics in law.

*1 – 3 credits, Seminar.*

### BLAW 375. Business, Law, and Ethics in Modern Society

In order to survive, business must meet the legal and ethical standards being imposed by a changing society. This course emphasizes that the business enterprise is not an island and that business decision-making must be undertaken in light of current legal and ethical demands. Such demands may take the form of globalization of business enterprise, reactions to hostile takeovers, concerns with market concentration and efficiency, changes in legal philosophy and corporate ethics and developments in international law and administrative regulation. By examining the philosophical, legal, social, historical, and political/economic regulatory environments, this course places business decision-making in the legal and ethical perspective so critical in today's markets.

*3 credits, Lecture. Open to MBA and nondegree business students, others with permission.*

### BLAW 376. Law for the Manager

All business activity must be conducted with a sensitivity toward both the requirements of the law and the legal ramifications that flow from discretionary action. Whether such activity involves the formation of a contract, the choice of a business organization, the use of an agent, the purchase or sale of securities, or the institution of a lawsuit, legal considerations are pervasive. This course exposes students to some of the basic tenets of business law including the judicial process, contracts, partnerships, corporations, securities regulation, labor law, torts, and the principal-agent relationship.

*3 credits, Lecture.*

### BLAW 396. Special Topics in Business Law

Faculty-student interaction on a one-to-one basis involving independent study of specific areas of law. Emphasis, selected by the student, may be on theoretical or applied aspects. A written report is required.

*1 – 6 credits, Independent Study. Instructor consent required.*

## Finance

### FNCE 300. Seminar

Investigation and discussion of special topics in finance, risk and insurance and/or real estate and urban economic studies.

*1 – 3 credits, Seminar.*

### FNCE 301. Financial Management

All major business decisions have financial implications, and therefore, the financial manager's contribution to directing the operations of the firm has become increasingly critical in the last decade. This course provides an overview of techniques for effectively studying financial decisions and their impact on the company. The course covers the basic concepts and tools necessary to understand the financial decision-making process. The fundamental issues of timing and uncertainty are integrated into the problem of asset valuation. Financial analysis models for determining appropriate sources of capital and effective use of long term and short term assets are discussed.

*3 credits, Lecture. Open to MBA students, others with permission. Prerequisite: ACCT 321.*

### FNCE 302. Investment and Security Analysis

A rigorous foundation in risk/return analysis, asset valuation, the use of derivatives, and financial engineering techniques in risk management and overall portfolio management. Information technology is applied, including computerized financial modeling and asset management software.

*3 credits, Lecture. Open to MBA students, others with permission. Prerequisite: FNCE 301.*

### FNCE 303. Corporate Finance

A markets-oriented approach to corporate finance issues, especially capital structure and dividend policy. Modern concepts of agency theory and asymmetric information are integrated.

*3 credits, Lecture. Open to MBA students, others with permission. Prerequisite: FNCE 301.*

### FNCE 304. Derivatives

Analysis and valuation of speculative securities including options and futures with emphasis on their use for hedging and speculative motives. Major valuation models are discussed and applications of contingent claim valuation framework to corporate finance problems are also explored.

*3 credits, Lecture. Prerequisite: FNCE 301 or permission of instructor.*

### FNCE 305. Global Financial Management

An exploration of global finance topics such as 1) international trade, 2) balance of payments, 3) exchange rate determination, 4) currency exposure, and 5) the cost of capital in global

financial markets. Information technology is applied.

*3 credits, Lecture. Open to MBA students, others with permission. Prerequisite: FNCE 301.*

### FNCE 306. Financial Institutions: Management and Capital Markets

Investigation of the structure financial services companies (banks, insurance companies, securities firms, and so forth). Emphasis is on the tools used by these firms to compete to provide basic financial services like pooling resources, managing risk, transferring economic resources, pricing information and clearing and settling payments. Financial services product development and the role of information technology in financial services, including software and data.

*3 credits, Lecture. Open to MBA students, others with permission. Prerequisite: FNCE 301.*

### FNCE 307. Working Capital Management

Working capital management is critical in determining whether a firm is competitive and profitable. Each component of working capital cash, marketable securities, receivables, inventories, and payables is studied and is related to the firm's operations. The course concentrates on applications and includes lectures by working capital managers from major corporations.

*3 credits, Lecture. Prerequisites: FNCE 301 and OPIM 303.*

### FNCE 308. Asset Allocation and Capital Market Theory

Provides an integrative overview of issues in financial theory. Contemporary theoretical developments in corporate finance and financial markets are addressed. Major topics include agency theory, option theory, term structure theory, CAPM, APT, market efficiency, capital structure, and dividend policies under full and asymmetric information.

*3 credits, Lecture. Prerequisite: FNCE 301 or permission of instructor.*

### FNCE 310. Personal Financial Planning

This course is for the professional working in the area of financial services as well as for one's personal planning. It is the application of finance theory to the individual and family. This integrated approach covers lifetime cash flows, asset accumulation and allocation, debt management, retirement planning, and risk management.

*3 credits, Lecture. Prerequisite: FNCE 301 or permission of instructor.*

### FNCE 311. Financial Modeling

This course is a "hands-on" use of computerized decision aids to analyze a variety of financial problems. Applications will be drawn from corporate financial planning, modern portfolio theory, options pricing, dynamic trading, and so forth. No computer experience is required; this

course will help students develop the necessary programming skills to build fairly sophisticated models.

*3 credits, Lecture. Prerequisite: FNCE 301.*

### **FNCE 312. Fixed Income Instruments and Markets**

This course examines contemporary portfolio management of fixed income institutional investors, issuers, and broker-dealers. It assesses current practice and presents a theoretical framework for anticipating change. Coverage includes pricing, assessment of return and risk, and the development of overall strategies, for these markets: government, corporate, municipal, and international bonds; mortgage-related and other asset-backed securities; and derivative securities including futures, options, swaps, and other interest rate contracts.

*3 credits, Lecture. Open to MBA students, others with permission. Prerequisite: FNCE 301.*

### **FNCE 313. Advanced Corporate Finance: Capital Investment Finance**

This course in dynamic capital budgeting applies corporate finance theory to the real-world problems that financial analysts face every day, integrating theory and practice, facilitated through the use of simulation analysis. These tools include both an understanding of the theoretical underpinnings of sound capital budgeting techniques and a mastery of the technology necessary to practically implement this knowledge in a real-world setting.

*3 credits. Prerequisite: FNCE 301.*

### **FNCE 317. Introduction to Economics, Financial Markets, and Information**

Provides a foundation in the economics of markets, with particular application to financial markets and the role of information. Specific topics include the following: (1) the basic principles of supply, demand, profit maximization, price determination, international trade, and exchange rates; (2) the basic structure of modern, global financial markets, as an application of the basic economic principles; (3) the use of information and information technology in financial markets, including use of the internet, Bloomberg, Dow Jones and other computerized sources of information; and (4) a review of the "efficient market hypothesis."

*3 credits, Lecture. Open to MBA and nondegree business students, others with permission.*

### **FNCE 321. Risk and Insurance**

A study of the recognition, analysis, and treatment of pure risk from the viewpoint of the enterprise. This course considers various methods of risk management but emphasizes the role of insurance.

*3 credits, Lecture. Prerequisite: FNCE 301 or permission of instructor.*

### **FNCE 330. Real Estate: A Personal Investment Perspective**

Real estate is a major component of household wealth. Important household real estate decisions include, for example, where to buy a house; renting versus owning a home; choosing between alternative mortgage instruments; understanding the house purchase transaction; and the risks and returns of real estate investing. This course surveys the fundamentals of real estate from a personal investment perspective.

*3 credits, Lecture.*

### **FNCE 331. The Internet and Information Systems Applied to Real Estate**

Specialized information technology is now available for all segments of the real estate industry. For example, investment firms are particularly interested in information technology that helps them monitor, understand, and manage risks associated with mortgage-backed securities. Database management systems and geographic information systems (GIS) give the decision-maker unprecedented power to manage data and analyze risks. The Internet opens up vast new sources of timely information. This course stresses the use of GIS and of the Internet. Students will gain hands-on experience with these tools through projects that are organized around business problems.

*3 credits, Lecture.*

### **FNCE 332. Real Estate Capital Markets**

This course covers the structure and operation of the mortgage market. Topics include the identification, measurement and management of risk from the perspective of borrower, lender, and investor. The course stresses the integration of the real estate debt markets with the global capital market, and considers the role and impact of mortgage-backed securities for residential and commercial real estate lending.

*3 credits, Lecture. Prerequisite: FNCE 301 or permission of instructor.*

### **FNCE 333. Real Estate Investment and Portfolio Management**

This course provides an overview of real estate investment decision-making. Topics include: risk-return analysis of alternative types of real estate investments; leases, operating costs, and tax consequences; valuation techniques, including discounted cash flow and option pricing; real estate portfolio management; and alternative forms of equity securitization such as real estate investment trusts.

*3 credits, Lecture. Prerequisite: FNCE 301 or permission of instructor.*

### **FNCE 396. Special Topics in Finance**

Faculty-student interaction on a one-to-one basis involving independent study of specific areas of finance, risk and insurance, and/or real estate and urban economic studies. Emphasis, selected by the student, may be on theoretical or applied

aspects. A written report is required.

*1 – 3 credits, Independent Study. Instructor consent required.*

### **FNCE 400. Investigation of Special Topics**

*1 – 2 credits, Seminar. Prerequisite: FNCE 308.*

### **FNCE 401. Introduction to Finance Theory and Evidence**

Topics include: efficient market hypothesis, utility theory, portfolio theory, CAPM, arbitrage pricing theory, option pricing, capital structure / tax theory, capital budgeting under uncertainty, current empirical studies.

*3 credits. Instructor consent required.*

### **FNCE 402. Corporate and Institutional Finance**

Topics include: information asymmetry, agency, internal capital markets, governance, market microstructure, moral hazard / adverse selection. Concepts are applied in both corporate and financial institution settings.

*3 credits. Instructor consent required. Prerequisite: FNCE 308.*

### **FNCE 403. Theory of Financial Markets and Valuation**

Topics include: fundamental pricing theorems, state preference theory, martingale pricing, dominance, spanning and arbitrage restrictions, consumption models, and continuous-time approaches to asset pricing, interest rate models, and derivatives pricing.

*3 credits, Lecture. Instructor consent required.*

### **FNCE 404. Empirical Methods in Finance Research**

Topics include: predictability of asset prices, time series models of market microstructure, event study methodology, tests of asset pricing models and derivative pricing models, market efficiency, volatility of asset returns, and term structure interest rates.

*3 credits, Lecture. Instructor consent required.*

*Prerequisite: FNCE 308.*

## **Health Systems Management**

### **HSMG 380. Health Care Delivery Systems**

This course examines the organization and management of health care services. Content areas focus on issues related to cost, accessibility, availability and quality of health care services, and its impact on the nation's economic development.

*3 credits, Lecture.*

### **HSMG 381. Health Care Law and Policy**

Examines the legal and regulatory requirements of the health care delivery system and the formation of health care policy. Emphasis is placed on understanding issues related to administrative and institutional liability, labor law, licensure, antitrust and ethics. Case studies

are used extensively.

*3 credits, Lecture. Prerequisite: HSMG 380.*

**HSMG 382. Decision Models in Health Administration**

Application of systems analysis and management science to managerial decision-making in health care institutions.

*3 credits, Lecture. Prerequisite: HSMG 380.*

**HSMG 383. Health Care Insurance and Finance**

This course examines financial management and insurance practices within the health care industry. Content areas include finance, economics, risk management, and insurance and their applications as they pertain to the health care industry. Main subject areas covered are the economics of health care, health insurance and compensation mechanisms, and financial management of health care organizations.

*3 credits, Lecture. Prerequisites: FNCE 301 and HSMG 380.*

**HSMG 384. Health Care Strategic Management and Technology**

This course examines theories, concepts and practices related to strategic management and planning within health care organizations. Key health-care related external and internal environmental factors are discussed, and their implications for health care strategic management. A project to design and implement a business planning process for a health care related organization is required.

*3 credits, Lecture. Prerequisites: HSMG 380, HSMG 381, and HSMG 383.*

**HSMG 385. Management of Long-Term Health Care Organizations**

This course examines administrative processes within the long-term health care facility including issues related to organizational effectiveness, financial management, the regulatory structure, operational procedures, policies and practices.

*3 credits, Lecture. Prerequisite: HSMG 380.*

**HSMG 386. Health Care Information Technology**

This course is designed to familiarize students with issues, trends, and applications related to information technology in the health care setting. Information technology systems decision-making will be stressed, including how it fits into business marketing plans the importance of ROI, and the examination of information technology from an industry perspective.

*3 credits, Lecture. Prerequisite: HSMG 380.*

**HSMG 389. Health Care Internship**

Under the guidance of a qualified preceptor, students are provided opportunities to study and analyze an organization's characteristics, functions, goals, strategies, and decision-making processes. Managerial skill is developed

through the performance of administrative tasks and through participation in problem-solving processes. A research paper is required.

*1 – 3 credits, Practicum. Instructor consent required.*

**HSMG 391. Management of Long-Term Health Care Organizations**

This course examines administrative processes within the long-term health care facility including issues related to organizational effectiveness, financial management, the regulatory structure, operational procedures, policies and practices.

*3 credits, Lecture. Instructor consent required. Not open to M.B.A. degree students.*

**HSMG 392. Internship in Health Care Management**

Under the guidance of a qualified preceptor, the student participates in the administrative process in the long-term health care organizational structure. A project is required.

*1 – 9 credits, Practicum. Instructor consent required. Not open to M.B.A. degree students.*

**HSMG 396. Special Topics in Health Care Management**

Faculty-student interaction on a one-to-one basis involving independent study of specific areas of health care management. Emphasis, selected by the student, may be on theoretical or applied aspects. A written report is required.

*1 – 6 credits, Independent Study. Instructor consent required.*

**Management**

**MGMT 300. Seminar**

Investigation and discussion of special topics in management.

*1 – 3 credits, Seminar. Instructor consent required.*

**MGMT 334. Entrepreneurship**

Entrepreneurship is concerned with more than creating, starting and growing small business ventures. Entrepreneurial issues and decisions occur long after the start-up phase has ended and an organization has grown large. Many larger organizations are trying to start and grow smaller units along with maintaining the entrepreneurial spirit. This course is concerned with these issues along with concepts related to acquiring, franchising and operating various types of entrepreneurial ventures. An applied approach is taken in the course through the study of cases.

*3 credits, Lecture.*

**MGMT 337. Managing Organizations for the Future**

Today's business climate demands that organizations be innovative, flexible, adaptive,

capable of maximizing the contributions of all their members, and above all, future-oriented. This course examines how to design effective organizations for the future by taking into account the hard-won lessons of both successful and failed business firms. Participants in this course develop an understanding of the fit among an organization's structure, environment, technology, and human resources. Topics such as organizational evolution, learning, survival, adaptation, innovation, and change management are addressed. The impact of organizational culture, conflict and politics are also considered. Using structured exercises, simulations and case studies of real life organizational dilemmas, participants gain insights and acquire practical tools for analyzing, designing, and changing organizations.

*3 credits, Lecture. Open to MBA and non-degree business students, others with permission..*

**MGMT 338. Enhancing Leader and Team Effectiveness**

Effective managers must possess the leadership and interpersonal skills necessary to manage an increasingly diverse work force. Knowing how to reap maximum benefit from an organization's human capital is essential for today's manager. This course focuses exclusively on the development and improvement of the participant's "people skills" as they relate to managing others and working on teams with others. Participants learn not only the latest concepts, but also receive constructive feedback on their own management and leadership style. Topics such as establishing interpersonal presence and rapport, managing diversity in a multi-cultural workforce, coaching and conducting performance appraisal sessions, managing group dynamics, building an effective decision-making team, developing a motivational climate, and exercising transformational leadership are explored. Through the use of experiential exercises and role playing, participants are given a "hands-on" opportunity to practice and refine their leadership and team skills as well as to gain significant insight into their own strengths and weaknesses as a manager.

*3 credits, Lecture. Open to MBA and nondegree business students, others with permission.*

**MGMT 339. Gender and Diversity in the Workplace**

The demographic composition of the international labor force is changing. In the United States, the proportions of both women and people of color have steadily increased in recent years. This course chronicles and examines the transition that is taking place in the workplace due to the increased diversity in employees. It examines gender-related issues such as sex differences and sex role development, occupational choice and organizational entry, peer and manager-subordinate interactions, sexual harassment, career development, the interface between work and family, and strategies for



promoting equal opportunity in organizations. It examines diversity issues stemming from differences in individual characteristics such as race, ethnicity, and national origin.  
*3 credits, Lecture.*

#### **MGMT 340. International Business**

The growing impact of a rapidly changing international business environment on organizations today means that few managers can afford to remain indifferent to the issues of international business. It is important to understand the changing patterns of international business, the dynamics of international competition, government-business interactions in other countries, and the organizational challenges of managing strategically across borders. This course addresses these issues through an applied approach in the discussion of cases.  
*3 credits, Lecture.*

#### **MGMT 350. Managerial Communications**

Designed to improve effective oral and written communication skills for managers. Topics in written communications include: organization, structure, and clarity of business communications; practice in writing formal papers and research reports; establishing style and tone in different types of written business communications. Topics in oral communications include: analysis of audiences, presentations to small and large groups, persuasion and motivation techniques, using audio-visual aids, and improving delivery and style using video feedback.  
*3 credits, Lecture.*

#### **MGMT 360. Management of Technology and Innovation**

In today's dynamic organizations, management of research, technology and change are generic processes which constitute irresistible and critical elements of the overall environment of business. Awareness of these processes can be a powerful force for an organization's management of its future. This course introduces the student to the management of innovation in several contexts, dealing with products and services, tangible and intangible outputs.  
*3 credits, Lecture. Open to MBA and nondegree business students, others with permission.*

#### **MGMT 372. Career Dynamics**

As individuals pass through organizations, they both shape them and are shaped by them. This course looks at the issues involved in integrating the individual with the organization through the process known as career development. In particular, it focuses on the realities of entry, membership, and advancement that occur in organizations. Topics cover career stages and life stages; career stages and organizational stages; individual self-assessment including personal characteristics, interests, values and interpersonal styles; individual career mapping; and changing jobs and careers.  
*1 – 3 credits, Lecture.*

#### **MGMT 373. Organizational Renewal Development**

Organizational renewal must be a regular part of the job of every manager. This course focuses on the management skills needed to diagnose, change and develop an organization. Participants learn not only the latest concepts but also are required to engage in organizational development (OD) exercises. Topics to be covered include methods of diagnosing organizations, planning and OD effort, deciding on a change strategy, fitting the intervention to the client's needs, managing an intervention and obtaining evaluative feedback. Through the use of exercises, presentations and hands-on-training, participants have the opportunity to practice their OD skills.  
*1 – 3 credits, Lecture.*

#### **MGMT 374. Negotiation Strategies**

Developing and implementing effective negotiation strategies and tactics is an increasingly important activity in a wide range of managerial positions. This course deals with negotiations both within and between organizations. Effective negotiations skills are essential for successful managers in complex contemporary organizations characterized by changing structures, temporary task forces, multiple demands on resources, and the increased importance of interdepartmental cooperation. Critical negotiation situations with other organizations range from those dealing with labor unions, purchasing, mergers, acquisitions, and joint ventures. During this course, participants plan and conduct negotiations simulations, as well as receive feedback on their performance.  
*3 credits, Lecture.*

#### **MGMT 375. Strategic Management of Human Resources**

Effective human resources management (HRM) is one of the most decisive factors in the success of any organization. This course examines how to manage human resources effectively in the dynamic legal, social, and economic environments currently constraining organizations. Among the topics included are: formulation and implementation of human resource strategy, job analysis, methods of recruitment and selection, techniques for training and management development, performance appraisal, compensation analysis and administration, and evaluation of the effectiveness of HRM systems. Attention is also given to the need for adjusting human resource strategies and tactics when applying them in a foreign setting. Emphasis is placed on integrating human resource management with other key aspects of management. A variety of teaching methods are used to help students acquire an understanding and appreciation of HRM.  
*3 credits, Lecture.*

#### **MGMT 381. Business and Managerial Ethics**

Recent observers of the business scene have questioned whether today's modern executive has lost his/her "moral compass." Clearly all businesses and their managers must be held accountable to ethical standards. At issue then is what is ethical behavior and what problems are created in trying to exercise such behavior. This course examines in detail the processes of policy formulation and implementation as they relate to ethical problems. Alternative responses to expressed and anticipated social needs, expectations and demands that arise in the daily conduct of business are considered.  
*3 credits, Lecture.*

#### **MGMT 382. Management Consulting**

This course introduces students to the roles individual consultants and consulting firms play in enhancing the effectiveness of their clients. The course draws on a wide range of management theory and practice to help students develop the interpersonal, analytical, and technical skills required in consulting interventions. The course will provide an overview of the consulting industry and address such topics as relationship and client management, intervention frameworks and their application, project management, ethical issues in consulting, and implementation issues.  
*3 credits, Lecture. Open to MBA and nondegree business students, others with permission.*

#### **MGMT 383. Organizational Development and Managing Change**

This course focuses on the planned, systematic process in which applied organizational theory and behavioral science principles and practices are introduced into organizations, toward the goal of increasing both individual and organizational effectiveness. Additionally, this course is designed to prepare students to become effective change agents at the individual, group, and organizational levels. The course addresses such topics as assessing organizational effectiveness/performance measurement, fundamental organizational development techniques, change methodologies, individual, group, and organizational change processes, applied research methods for analysis of change problems, process interventions, the power and politics of change, and strategic change.  
*3 credits, Lecture. Open to MBA and nondegree business students, others with permission.*

#### **MGMT 384. Management Consulting Practicum**

The goal of this practicum is to give students hands-on experience with clients and the rigors of consulting interventions — whether they be strategic, information systems, or change management oriented. Students are required to prepare a consulting proposal for a client (scope of work, timeline, etc.), negotiate an end-product with the client, perform the proposed intervention, prepare a final report and present findings

and recommendations to the client for evaluation and critique.

*3 credits, Practicum. Open only to MBA students in the Management Consulting concentration.*

**MGMT 389. Formal Corporate Planning Systems**

Planning is a corporate, group, and business function whose character has changed markedly and whose importance is universally recognized. Special attention is given to particular topics: environmental forecasting, corporate vs. business planning, staff vs. line functions, cycling/rolling systems, planning's impact on results, and others. In order to emphasize the essential nature of creating a managerial system which is efficient and effective through tailoring it to the specific requirements of the organizational setting, the work of the course centers on case analyses, but it employs also, as appropriate, lectures, discussions, and field projects and reports.

*3 credits, Lecture.*

**MGMT 390. Strategy, Policy, and Planning**

A firm's ability to survive and succeed in an increasingly competitive global arena depends on its ability to develop and maintain an effective strategy. This capstone course deals with the two major aspects of strategy: formulation and implementation. Strategy formulation examines such issues as environmental threats and opportunities, the values and priorities of management and societal stakeholders, and the strengths of company resources and competencies relative to principal competitors. Strategy implementation covers such topics as strategic leadership, organizational structure, resource allocation, and building a strategy-supportive culture. The course uses cases and readings to develop the knowledge and skills necessary to prepare students to deal with strategic issues. The student must have completed basic courses in the functional areas of business in order to be ready to assume the holistic perspective required of those who address this important topic.

*3 credits, Lecture. Open to MBA and nondegree business students, others with permission.*

**MGMT 391. Advanced Strategy, Policy, and Planning**

This advanced strategy course offers practical tools to evaluate sources of a firm's competitive advantage. A supplement to the capstone course, This course offers an in-depth look at special strategic problems such as the implementation of strategy, corporate renewal, strategy formulation in decline contexts, and/or political elements of strategy.

*3 credits, Lecture.*

**MGMT 396. Special Topics in Management**

Faculty-student interaction on a one-to-one basis involving independent study of specific areas of management. Emphasis, selected by the student,

may be on theoretical or applied aspects. A written report is required.

*1 – 3 credits, Independent Study. Instructor consent required.*

**MGMT 400. Directed Readings in Special Topics**

*1 – 6 credits, Independent Study. Open to Ph.D. students in the School of Business only.*

**MGMT 401. Seminar in Organizational Behavior**

A survey of research in organizational behavior and theory. Topics include learning and cognition in organization, attribution theory, satisfaction and performance, leadership, motivation and group dynamics.

*3 credits, Seminar.*

**MGMT 402. Research Methods in Strategic Management**

This course is an in-depth review of the content of policy research. The course is designed to cover several "streams" of research currently popular in the strategic management literature. The course will cover the major findings within each stream.

*3 credits, Seminar.*

**MGMT 403. Contemporary Research in Organizational Behavior**

Focus is on several of the contemporary research themes popular in Organization Behavior. Students critique the methodology and future potential of each theme.

*3 credits, Seminar.*

**MGMT 404. Seminar in Strategic Management**

Reviews the research of strategic management that emphasizes macro explanatory models. Students review recent dissertations and critique the content and methodology of each.

*3 credits, Lecture.*

**MGMT 405. Research Design**

Examination of research methods utilized in management research. Topics include the laboratory-field distinction, randomized experiments in field settings, content analysis and interrater reliability, log-linear analysis, instrument design and reliability analysis, survey design and sampling techniques, meta-analysis, quasi-experimental design, nonequivalent group design, interrupted time-series design and correlational analysis.

*3 credits, Lecture.*

**MGMT 406. Applied Research in Management**

Students, individually or in groups, formulate, conduct and prepare a written report in publishable format on a research project pertaining to the area of management. Meetings will be devoted to discussion of issues which arise in the conduct of student projects and to presentation of projects.

*3 credits, Lecture.*

**Marketing**

**MKTG 300. Seminar**

Investigation and discussion of special topics in marketing.

*1 – 6 credits, Seminar.*

**MKTG 315. Market-Driven Management**

The purpose of a business is to create a satisfied customer. To accomplish this objective managers must incorporate both their customers' and competitors' perspectives into their decision-making. This course focuses on the necessity to become a market-driven organization. Topics covered in this course include: market segmentation and target marketing, marketing research for obtaining critical customer information, development of marketing strategies, product development and the key linkage between marketing and R&D, pricing strategies and implementation, working with distribution partners, developing effective promotional programs, control and evaluation of the marketing function. These and other topics are applied in a wide range of market arenas such as global marketing, the new service economy, industrial and high technology products, consumer goods and services, financial services, and health care.

*3 credits, Lecture. Open to MBA and non-degree business students, others with permission.*

**MKTG 320. Strategic Relationship Marketing**

This course discusses the scope of interactive marketing strategies and programs and introduces business models that are suited for this purpose. It covers the concept of customer lifetime value and its linkage to various customer relationship forms including customer, partner, stakeholder, and employee relationship marketing. Cross-marketing strategies for maximizing customer lifetime value are emphasized. Brand development and brand equity management are also explored from a relationship marketing perspective. Integrated marketing communications and interactive marketing tools including digital marketing are discussed. Students obtain hands-on experience of creating detailed marketing plans with appropriate financials for typical interactive marketing situations. Case studies of actual companies are used to better illustrate the concepts.

*3 credits, Lecture. Prerequisite: MKTG 315.*

**MKTG 325. Marketing for Global Competitiveness**

The United States is the largest market for consumer goods in the world, yet it is also one of the slowest growing markets. Faced with increasing competition from American, Japanese, European and other global competitors, all companies are faced with the necessity of developing truly global marketing strategies. This course helps prepare the manager for these

challenges by investigating specific success criteria in the world's major markets. Cultural, political, economic and institutional factors are discussed and their implications for marketing strategies are explored.

*3 credits, Lecture. Prerequisite: MKTG 315.*

**MKTG 330. New Product and Innovation Management**

This course takes a "whole enterprise" approach to the management of innovation, based on the perspectives of product managers and a CEO. The course's primary objective is to develop effective conceptual frameworks and analytical tools for managing innovation throughout the firm. The analytical tools used in the course range from traditional methods for forecasting new product performance (e.g. Bases, Assessor, etc.) to more sophisticated methods that use virtual reality lab environments. Topics include the nature of innovation, new product development processes, new product sales forecasting, successful integration of marketing and R&D, and acceleration of the new product process from design to commercialization advantages.

*3 credits, Lecture. Prerequisite: MKTG 315.*

**MKTG 335. Marketing for Non-Profit Institutions**

With reduced financial support from the government, non-profit organizations must adopt a marketing orientation to successfully survive in the turbulent environments which they face. This course explores techniques to analyze market needs and environmental opportunities as the basis for planning the products, services and communications of such non-profit organizations as government agencies, social action groups, universities, hospitals, religious organizations, charities, museums, public arts organizations, and civic groups. The course utilizes extensive case studies as well as field projects.

*3 credits, Lecture. Prerequisite: MKTG 315.*

**MKTG 340. Integrated Marketing Communications**

The implementation of integrated marketing communications is increasingly important for an organization's competitiveness. This course covers: communications models; the communications mix; communications strategy - including setting objectives, designing and implementing communications programs, and evaluation. Emphasis upon: customer response models; interactive marketing; direct marketing; information driven marketing; measuring customer life-time value, creation and use of marketing data bases in communications strategy, the emergence of one-to-one marketing, and measurement of marketing productivity.

*3 credits, Lecture. Prerequisite: MKTG 315.*

**MKTG 345. Business and Industrial Marketing**

Explores the differences between consumer markets and business-to-business or industrial markets. Organizational buying models are

discussed as they apply to a variety of purchasing situations. Special consideration is given to industrial and high technology market segmentation, industrial distribution, industrial sales practices, and requirements of cross functional marketing.

*3 credits, Lecture. Prerequisite: MKTG 315.*

**MKTG 350. Marketing Research and Information Systems**

This course discusses the collection and use of information on customers and their needs for designing marketing programs. The course develops skills in obtaining and using customer input for product design, communications, pricing, distribution, and customer service decisions. Some of the topics covered include: research design; use of secondary information sources; decision support systems; sampling techniques; questionnaire design; scaling and measurement; and multivariate data analysis procedures. The applications discussed in the course include the creation and use of data-warehouses; customer satisfaction measurement; customer-based brand equity measurement; and the use of the Internet as an information-gathering tool.

*3 credits, Lecture. Prerequisites: MKTG 315 and OPIM 303.*

**MKTG 351. Database Marketing**

Introduces students to the concepts, methods, and quantitative tools for creating and exploiting customer databases. The course will have a strong hand-on methodological orientation with emphasis on applications involving real customer data. Students will learn quantitative tools for estimation of customer lifetime value, customer response modeling (e.g., multiple regression, logistic regression, cluster analysis, discriminant analysis, and neural network analysis) and experimentation in test markets. Applications will include prospecting, market segmentation and targeting, product customization, cross-selling, and customer loyalty programs. The applications will span several different types of businesses, such as Internet retailing, financial services, computers, and knowledge-intensive enterprises.

*3 credits, Lecture. Prerequisite: MKTG 315.*

**MKTG 355. Pricing Strategies**

One of the most closely scrutinized aspects of the marketing mix, pricing is a critical factor in the success of both new and old products and services. This course examines the price-setting process and the role of marketing, engineering, manufacturing and other business functions in price determination. Students will integrate economic and behavioral aspects of customer response to pricing, legal constraints as they impact the marketing manager's pricing flexibility, and the particular problems of pricing within the context of a global marketing strategy.

*3 credits, Lecture. Prerequisite: MKTG 315.*

**MKTG 360. Customer and Market Behavior**

Current theories and research of buyer behavior from marketing, psychology, sociology, cultural anthropology, and economics are analyzed with special attention to their application in managerial decision-making. Specific theories of buyer learning, attitude development, perception, group interactions and decision-making, organizational dynamics, personality and culture are used to explain and predict customer response to market offerings.

*3 credits, Lecture. Prerequisite: MKTG 315.*

**MKTG 362. Services Marketing**

An examination the application of marketing principles to the service arena. Exploration of the differences between the marketing of goods and services. Development of appropriate decision models for services in consumer and industrial market segments and the use of services as a differentiation tool for product marketers. Topics include new service development; the service-profit chain; evaluating service quality; strategic service management; and the impact of customer satisfaction and loyalty on company profits. A variety of service industries are used as points of illustration, including telecommunications; insurance and financial services; health care; and business-to-business services such as advertising, temporary employees, and accounting.

*3 credits, Lecture. Prerequisite: MKTG 315.*

**MKTG 365. Digital Marketing**

An exploration and evaluation of the potential for digital technology, especially the Internet, to enhance the marketing of goods and services. Emphasis is on strategies and tactics for creating, retaining, and enhancing customer relationships via the World-Wide-Web, and on integrating the digital environment into other elements of the marketing mix. Business models for cyberspace are compared and contrasted with those for physical space. Heavy reliance on the Internet as a teaching tool.

*3 credits, Seminar. Prerequisite: MKTG 315.*

**MKTG 396. Special Topics in Marketing**

Faculty-student interaction on a one-to-one basis involving independent study of specific areas of marketing. Emphasis, selected by the student, may be on theoretical or applied aspects. A written report is required.

*1 - 6 credits, Independent Study. Instructor consent required.*

**MKTG 400. Investigation of Special Topics**

*1 - 6 credits, Lecture. Open only to students in the Marketing doctoral program.*

**MKTG 401. Seminar in Research Methods in Marketing**

Provides an introduction to key issues in research design and philosophy of science as they apply to marketing and to the applied social sciences in general. Methods to assess and



ensure reliability and validity in designs, procedures, and measures are examined. Seminar readings and discussion also provide an overview and appreciation of different research styles and orientations in marketing. Relationships among conceptual, methodological, and substantive domains in marketing are explored. *3 credits, Seminar. Instructor consent required.*

**MKTG 402. Advanced Seminar in Buyer Behavior**

Covers skills necessary for conceptualizing and evaluating contemporary research in buyer behavior. Covers substantive areas such as: attitude theory, affect, information processing, buyer decision making, advertising, and cultural meanings of goods. Also covers the use of appropriate quantitative and interpretive methods in buyer behavior. *3 credits, Seminar. Instructor consent required.*

**MKTG 403. Quantitative Models in Marketing**

This seminar provides an introduction to mathematical models in marketing. The focus is on a selective survey of the literature in some of the major modeling areas in marketing. The discussion emphasizes model applications rather than the mathematics underlying model development. Market definition and response models, decision-support models, and models of marketing phenomena are covered. *3 credits, Seminar. Instructor consent required.*

**MKTG 410. Seminar in Theory and Practice in Marketing**

Seminar discussions focus on scholarly research on substantive problems in marketing strategy and in marketing program decisions. The seminar also examines the conceptual foundations of marketing and the evolution of marketing thought and practice. Conceptual and empirical contributions toward the understanding of marketing phenomena are discussed. *3 credits, Seminar. Instructor consent required.*

**MKTG 496. Special Topics: Progress Toward Qualifying Paper**

Independent study under faculty supervision in area chosen for doctoral student's qualifying paper. Satisfactory progress on qualifying paper (including literature review and research conceptualization) is required. Student can also determine research design, conduct pilot studies, and refine questionnaires and measures. A written report is required. *3 credits, Independent Study. Open only to students in the Marketing doctoral program.*

**Operations and Information Management**

**OPIM 300. Seminar**

Introduces many of the most exciting concepts emerging in the field of consumer oriented Internet-working, including high speed access

[cable modem, satellites and digital subscriber lines (DSL)] and infrastructure developments such as gigabyte networking with asynchronous transfer mode (ATM). Evaluates the emerging directions in EC that are expected to shape both consumer and business applications in the coming decade. A "macro perspective" is used to examine the technical and managerial aspects of electronic commerce. Focus is on questions such as: What are or will be the key attributes of current and future digital products, payment systems, online retailing, and banking? How are these systems designed and implemented? What are the different mercantile processes and tradeoffs associated with these processes? What impact has global connectivity made on traditional supply-chain(s)? *1 - 6 credits, Seminar.*

**OPIM 302. Mathematical Analysis for Business**

Review of algebra followed by introduction to functions, limits, differentiation, integration, vectors, matrices and linear programming. Examples and applications of mathematical topics to business problems. *3 credits, Lecture.*

**OPIM 303. Managerial Statistics**

A manager is concerned with recognizing and formulating statistical problems in business decision-making. This course covers some of the more familiar classical inference procedures and the basic statistical concepts that are often essential to the interpretation of business data. Methods of understanding variability, and detecting changes are explored using descriptive, exploratory, and inferential statistics found in widely available statistical packages. Topics include: discrete and continuous random variables, sampling, confidence intervals, hypothesis testing, and linear regression. *3 credits, Lecture. Open to MBA and non-degree business students, others with permission.*

**OPIM 304. Advanced Managerial Statistics**

Study of intermediate statistical analysis for managerial control. Includes multiple linear regression, time series analysis, sample designs, and analysis of variance. *3 credits, Lecture. Prerequisite: OPIM 303.*

**OPIM 310. Operations Management**

An operations manager is concerned with designing, operating and controlling a system for producing goods and services. Design decisions include selecting a process technology, organizing jobs, selecting vendors, and developing the location and layout of facilities. Operating the system involves planning and scheduling work and material flow, controlling quality, and managing inventories. General systems concepts and models are developed and applied. Topics include process flow analysis, inventory systems, waiting line analysis, quality design, capacity resource planning, project management, and integrating operations with the

firm's strategic plans. *3 credits, Lecture. Open to MBA students, others with permission. Prerequisite: OPIM 303.*

**OPIM 341. Operations Research in Management**

Study of managerial applications of operations research, using mathematical programming, systems analysis, and simulation methods. *3 credits, Lecture.*

**OPIM 365. Management Information Systems**

A manager is concerned with the solution of business problems by exploiting the information resources that are becoming available through the explosion in information technology. The emphasis is on business applications and how to structure the development and use of information systems for maximum benefit to the organization. Topics include: decision support systems, impact of the computer upon individual and organizations, competitive implications, technology change, telecommunications, and control of information systems resources. *3 credits, Lecture. Open to MBA and non-degree business students, others with permission.*

**OPIM 368. System Simulation**

Development, application, and evaluation of systems simulation models. The use of simulation languages in conjunction with digital computers. *3 credits, Lecture. Prerequisites: OPIM 303, OPIM 304, and OPIM 365.*

**OPIM 370. Systems Development**

Builds upon the student's acumen in business, IT programming, data structures/data-base, and electronic commerce. Integrates the areas of computer technology, information systems analysis, systems design, and organizational behavior to aid in the design of large scale systems and systems applications. Various approaches to information systems design and specification are presented. Topical coverage includes infrastructure issues, IT enabled virtual organizations, and systems to facilitate electronic commerce. Students identify an actual systems problem, and analyze and design a small system. *3 credits, Lecture. Open to MBA students, others with permission. Prerequisite: OPIM 365.*

**OPIM 371. Decision Support Systems**

Examines computer based decision support modeling technologies for loosely structured problems. Emphasis is placed on "hands on" involvement with commercially available decision support systems and on designing and implementing simple decision support systems for special managerial problems. *3 credits, Lecture. Prerequisite: OPIM 365.*

**OPIM 372. Data Base Systems**

Introduces concepts of databases and how they can be leveraged to manage data for improving business competitiveness. The industry standard relational database model is covered in detail,

with hands-on examples on database design, implementation, data storage, retrieval and processing, using a leading DBMS tool. Also introduces SQL, the *de facto* language for building and querying large-scale databases. Database integrity, security and administration issues are discussed. Features and selection criteria of DBMS tools for various business purposes are highlighted.

*3 credits, Lecture. Open to MBA students, others with permission. Prerequisite: OPIM 365.*

#### **OPIM 380. Managing and Controlling Information Systems**

Examines the management control problems and systems development processes from the dual perspective of (a) managers of the computer information system, and (b) the organization as a whole, including persons who interact extensively with the systems personnel or are administratively in a position to influence the information system.

*3 credits, Lecture. Prerequisite: OPIM 365.*

#### **OPIM 396. Special Topics in Information Management**

Faculty-student interaction on a one-to-one basis involving independent study of specific areas of operations management, operations research and/or information management. Emphasis, selected by the student, may be on theoretical or applied aspects. A written report is required.

*1 - 3 credits, Independent Study. Instructor consent required.*

#### **OPIM 401. Research Methods for Operations and Information Management**

Several advanced analytical methods that are relevant to students' areas of research will be studied in depth in this seminar. Topics may include special mathematical programming; complex decision making; linear models; advanced statistical analysis; and stochastic processes.

*3 credits, Seminar.*

#### **OPIM 402. Seminar in Operations Management**

Introduces doctoral students to the current research concerns in the field of Operations Management. The course will also acquaint students with the variety of research tools used in the field, enable them to critically evaluate the research of other scholars in the field as well as to develop research skills in identifying potential research problems to be analyzed.

*3 credits, Seminar.*

#### **OPIM 403. Seminar in Management Information Systems**

A topic on a significant applied or theoretical aspect of information systems will be chosen. Broadly, these aspects will encompass modeling, design, implementation, testing, and operation of computer information systems, and the implications of information technologies for the organization.

*3 credits, Seminar.*

### ■ All Sections

#### †GRAD 395. Master's Thesis Research

*1 - 9 credits.*

#### †GRAD 396. Full-Time Master's Research

*3 credits.*

#### †GRAD 397. Full-Time Directed Studies (Master's Level)

*3 credits.*

#### GRAD 398. Special Readings (Master's)

*Non-credit.*

#### GRAD 399. Thesis Preparation

*Non-credit.*

#### †GRAD 495. Doctoral Dissertation Research

*1 - 9 credits.*

#### †GRAD 496. Full-Time Doctoral Research

*3 credits.*

#### †GRAD 497. Full-Time Directed Studies (Doctoral Level)

*3 credits.*

#### GRAD 498. Special Readings (Doctoral)

*Non-credit.*

#### GRAD 499. Dissertation Preparation

*Non-credit.*

## CHEMICAL ENGINEERING

*Department Head:* Associate Professor Joseph Helble

*Professors:* Cooper, Coughlin, Cutlip, Fenton, M. Shaw, and Weiss

*Associate Professors:* Achenie, Anderson, Erkey, Parnas, and Wood

*Assistant Professor:* Mather, Srivastava, and Zhu

The Department offers studies and research programs leading to the degrees of Doctor of Philosophy and Master of Science in chemical engineering. Areas of special interest include: environmental engineering, electrochemical engineering, biochemical engineering, polymer science and engineering, kinetics, catalysis and reaction engineering, computer simulation of chemical processes, process optimization, and process dynamics and control.

**Requirements for the Ph.D. Degree.** Ph.D. candidates must pass both written and oral qualifying examinations taken after the first semester of graduate study. The written exam covers the areas of thermodynamics, transport phenomena, and kinetics (CHEG 301, 315 and 321 are recommended preparation for this exam). The oral exam involves the critique and discussion of a paper from the literature assigned to the student after passing the written exam. The doctoral plan of study developed jointly by the student and his/her advisory committee usually includes one year of full-time course work beyond the master's degree. Doctoral students also must fulfill a foreign language requirement of the Graduate School (which may be satisfied by courses in a related or supporting area such as math or computer science). In addition to the qualifying exams, the student must complete a General Examination and the writing of a Ph.D. dissertation proposal, which is defended orally. The Ph.D. dissertation must contain the results of original research in chemical engineering. An oral defense of the dissertation is required.

**Special Facilities.** The Department maintains large, well-equipped laboratories. Facilities and research opportunities are available through a number of other departments and University Institutes as well, including Chemistry, the Institute of Materials Science, the Pollution Prevention Research and Development Center, the Environmental Research Institute, the Biotechnology Center, Booth Research Center and the Advanced Technology Institute. Examples of equipment available in these research laboratories include: clean room for surface and interface research, polymer preparation and characterization instrumentation, surface analysis equipment, a wide variety of analytical and visualization equipment, electrochemical instrumentation and reactors, electro dialysis units, fuel cell lab, injection molding machine, and a variety of biological reactors. Computing resources are widely available, including those in the University Computer Center and the Booth Computer Applications and Research Center. Machine, glass and electronics shops provide services for the construction of specialized equipment.

## COURSES OF STUDY

**CHEG 300. Independent Study**

Independent study under the supervision of a Chemical Engineering faculty member.

*1 – 3 credits, Independent Study. Instructor consent required.*

**CHEG 301. Chemical Engineering Thermodynamics I**

An advanced study of classical thermodynamics with emphasis on phase and chemical equilibria and applications to the chemical process industries. Kinetic theory and statistical thermodynamics with emphasis on the prediction and correlation of physical and chemical properties of gases and liquids, including mixtures. Theory and application of flames, plasmas, and shock waves.

*3 credits, Lecture.*

**CHEG 302. Chemical Engineering Thermodynamics II**

An advanced study of classical thermodynamics with emphasis on phase and chemical equilibria and applications to the chemical process industries. Kinetic theory and statistical thermodynamics with emphasis on the prediction and correlation of physical and chemical properties of gases and liquids, including mixtures. Theory and application of flames, plasmas, and shock waves.

*3 credits, Lecture.*

**CHEG 311. Transport Phenomena**

An advanced study of transport phenomena and rate processes with emphasis on a differential balance approach. Designed for non-chemical engineers and chemical engineers with an inadequate background in differential balances.

*3 credits, Lecture.*

**CHEG 315. Transfer Operations I**

An advanced study of momentum, heat and mass transfer with application to complex problems. Cartesian tensors, non-Newtonian flow, statistical theory of turbulence. Mass transfer in multicomponent systems and with chemical reaction. Mass transfer in drops and bubbles; two-phase flow and fluidization.

*3 credits, Lecture.*

**CHEG 316. Transfer Operations II**

An advanced study of momentum, heat and mass transfer with application to complex problems. Cartesian tensors, non-Newtonian flow, statistical theory of turbulence. Mass transfer in multicomponent systems and with chemical reaction. Mass transfer in drops and bubbles; two-phase flow and fluidization.

*3 credits, Lecture.*

**CHEG 320. Investigation of Special Topics**

This course is designed for special topics, or for individual students who desire to pursue

investigations in a specialized field.

*1 – 3 credits, Lecture.*

**CHEG 321. Reaction Kinetics I**

Chemical kinetics and reactor design. An advanced study of chemical reaction engineering with emphasis on catalysis. Applications to stirred-tanks, fixed-bed, and fluidized bed reactors.

*3 credits, Lecture.*

**CHEG 322. Reaction Kinetics II**

Chemical kinetics and reactor design. An advanced study of chemical reaction engineering with emphasis on catalysis. Applications to stirred-tanks, fixed-bed, and fluidized bed reactors.

*3 credits, Lecture.*

**CHEG 325. Equilibrium Stage Operations**

Principles of the design of multicomponent stage processes. Emphasis on distillation, but with applications to extraction and absorption. Azeotropic and extractive distillation, batch distillation and transient behavior of processes, tray efficiencies.

*3 credits, Lecture.*

**CHEG 331. Process Engineering**

Applications of thermodynamics, kinetics, unit operations, mechanics, and economics to the design of process plant equipment and complete plant design.

*3 credits, Lecture.*

**CHEG 332. Process Engineering**

Applications of thermodynamics, kinetics, unit operations, mechanics, and economics to the design of process plant equipment and complete plant design.

*3 credits, Lecture.*

**CHEG 336. Process Dynamics and Control I**

Dynamic behavior of chemical process operations. Distributed parameter and non-linear processes. Specification of control systems. Stability analysis. Optimal operation of chemical processes. Design of feedback and feedforward control schemes for multiloop processes. Adaptive control.

*3 credits, Lecture.*

**CHEG 337. Process Dynamics and Control II**

Dynamic behavior of chemical process operations. Distributed parameter and non-linear processes. Specification of control systems. Stability analysis. Optimal operation of chemical processes. Design of feedback and feedforward control schemes for multiloop processes. Adaptive control.

*3 credits, Lecture.*

**CHEG 345. Chemical Engineering Analysis I**

Techniques for the solution of chemical engineering problems including the solution of ordinary and partial differential equations,

numerical analysis, and computer simulation.

*3 credits, Lecture.*

**CHEG 346. Chemical Engineering Analysis II**

An advanced study of the mathematics and computation of optimization of chemical engineering problems. Linear and non-linear applications.

*3 credits, Lecture. Prerequisite: CHEG 345.*

**CHEG 347. Optimization**

Advanced topics in optimization such as linear and nonlinear programming, mixed-integer linear and non-linear programming, deterministic and stochastic global optimization, and interval global optimization. Example applications drawn from engineering.

*3 credits, Lecture. Department consent required.*

**CHEG 350. Nuclear Reactor Design**

Involves the complete design of a reactor: conception, core design, critical parameters, heat removal, shielding, instrumentation.

*3 credits, Lecture. Prerequisite: CHEG 345.*

**CHEG 351. Polymer Physics**

Modern concepts relating to glassy, rubbery and organized states of bulk polymers. Considers rubber elasticity, glass-to-rubber transitions, networks, elements of crystallization, blends and interfacial phenomena.

*3 credits, Lecture.*

**CHEG 352. Polymer Properties**

Interrelationships between solid state structure, dynamics, and mechanical properties of non-crystalline and semi-crystalline polymers. Considers polymer viscoelasticity, diffusion, failure mechanism, and elementary polymer rheology.

*3 credits, Lecture.*

**CHEG 355. Polymer Structure and Morphology**

A fundamental study of the various levels of structure and morphology in polymers from the molecular to the macroscopic level, and how this structure influences the overall material properties. The principle methods used to characterize morphology are described for the analysis of amorphous and crystalline homopolymers, polymer blends, and copolymers.

*3 credits, Lecture. Prerequisite: CHEM 381.*

**CHEG 356. Adhesion**

A study of both physical and chemical factors controlling adhesion behavior. Thermodynamics, surface energy and surface tension. Intermolecular forces. Surface roughness effects. Mechanical evaluation of bond strength. Factors controlling adhesion durability. Chemical coupling agents.

*3 credits, Lecture. Prerequisite: CHEG 351.*

**CHEG 357. Surface and Interfacial Properties of Polymers**

A comprehensive coverage of the fundamental



behavior of polymers at surfaces and interfaces from a molecular perspective. Techniques are described for the characterization of interfacial properties. Topics include polymer adsorption, surface segregation in multiconstituent polymers, polymer-polymer interface structure, wetting and contact angles, surface and interfacial tension, and Langmuir-Blodgett monolayers.

*3 credits, Lecture. Prerequisite: CHEM 381.*

#### **CHEG 358. Composite Materials**

An introduction to the mechanical properties of fiber reinforced composite materials. Included are discussions of the behavior of unidirectional composites, short fiber composites and laminates. Special topics such as fatigue, fracture and environmental effects are also included.

*3 credits, Lecture.*

#### **CHEG 361. Nuclear Chemical Engineering**

Scientific and engineering principles involved in processes and materials of importance in nuclear chemical technology. Chemical processing of nuclear feed fuels. Separation of isotopes, purification of metals, solvent extraction, separation of reactor products, radioactive waste disposal and utilization in chemical processes.

*3 credits, Lecture. Formerly CHEG 360.*

#### **CHEG 363. Electrochemical Engineering**

Principles underlying electrochemical processes. Transformation of chemical and electrical energy. Applications of fundamental electrochemical laws to industrial processes, energy conversion, and electrometallurgical operations.

*3 credits, Lecture. Instructor consent required.*

#### **CHEG 367. Polymer Rheology**

Analysis of the deformation and flow of polymeric materials. Topics include non-Newtonian flow, viscoelastic behavior and melt fracture with application to polymer processing.

*3 credits, Lecture.*

#### **CHEG 368. Polymer Rheology and Processing Laboratory**

Classical and modern experimental techniques for measuring the viscoelastic properties of polymers. Experiments include: creep, dynamic mechanical analysis, cone and plate viscometer, single-screw extruder, capillary rheometer, and extensional viscosity.

*3 credits, Lecture. Prerequisite: CHEG 367.*

#### **CHEG 373. Biochemical Engineering**

Principles and design of processes involving biochemical reactions. Nature of biological materials, biochemical kinetics, heat and mass transfer, application to fermentation and other biological processes.

*3 credits, Lecture. Also offered as BME 321. Formerly CHEG 383.*

#### **CHEG 374. Bioremediation**

Application of engineering and biological principles toward remediation of hazardous wastes. Degradation of toxic chemicals using genetically-engineered microorganisms. Biological contacting devices for waste remediation.

*3 credits, Lecture. Department consent required.*

#### **CHEG 375. Fermentation and Separation Technology Laboratory**

Introduction to techniques used for industrial mass culture of prokaryotic and eukaryotic cells, and methods used to extract useful products from these cultures. Metabolic processes, energetics, growth kinetics and nutrition of microorganisms. Synthesis of cellular material and end products. Heat exchange, oxygen transfer, pH control, sterilization and design of fermentors. Culture of eukaryotic cell mass.

Immobilized enzyme and cell reactors. Product recovery methods of precipitation centrifugation, extraction filtration and chromatography.

*3 credits, Laboratory. Instructor consent required. Also offered as MCB 384. Formerly CHEG 384.*

#### **CHEG 381. Water Purification Principles**

An advanced study of the application of thermodynamics, transfer operations, and chemical kinetics to disposal and recovery of aqueous industrial and municipal wastes.

*3 credits, Lecture.*

#### **CHEG 382. Environmental Systems Engineering**

The analysis and design of water and wastewater treatment systems using optimization techniques and control theory.

*3 credits, Lecture.*

#### **CHEG 385. Air Pollution**

Sources and properties of air pollutants, atmospheric chemistry, dynamics of atmospheric pollution, analytical and sampling techniques, control and abatement processes and air pollutants.

*3 credits, Lecture. Prerequisites: CE 390 or ENVE 300 for non-CHEG majors.*

#### **CHEG 387. Aerosol Science**

Physics and chemistry governing aerosols. Particle formation and growth, aerosol particle dynamics, and population balances. Techniques for particle characterization are also addressed. Systems include ambient particulate matter and materials

*3 credits, Lecture. Department consent required.*

#### **CHEG 389. Chemical Transport Processes in the Environment**

Movement and fate of chemicals within the air, water, and soils in the environments. Emphasis on interfacial processes and exchange rates involving surface water, groundwater and air pollution problems.

*3 credits, Lecture.*

#### **†CHEG 391. Seminar**

*1 credit, Seminar.*

#### **†CHEG 392. Seminar**

*1 units min / 1 units max, Seminar.*

#### **CHEG 393. Seminar**

*0 credits, Seminar.*

#### **CHEG 394. Seminar**

*0 credits, Seminar*

#### **†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

#### **†GRAD 396. Full-Time Master's Research**

*3 credits.*

#### **†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

#### **GRAD 398. Special Readings (Master's)**

*Non-credit.*

#### **GRAD 399. Thesis Preparation**

*Non-credit.*

#### **†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

#### **†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

#### **†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

#### **GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

#### **GRAD 499. Dissertation Preparation**

*Non-credit.*

## CHEMISTRY

*Department Head:* Professor Steven L. Suib

*Professors:* W. Bailey, Basu, Birge, Bohn, David, Frank, S. Huang, Kumar, Michel, Mueller-Westerhoff, Rusling, M. Smith, Stuart, Sung, and Tanaka

*Associate Professors:* Howell, Papadimitrakopoulos, Seery, and B. Shaw

*Assistant Professors:* Brückner, Peczuh, and Sotzing

The Department of Chemistry offers course work and research in the areas of analytical, biological, environmental, inorganic, organic, physical, and polymer chemistry leading to the M.S. and Ph.D. degrees in Chemistry. Research projects within these general areas include: Analytical – atomic spectroscopy, analytical and physical electrochemistry, biomedical and environmental analysis, mass spectrometry, microanalytical techniques, separations, and surface and colloid chemistry; Biological – bio-analytical, bio-inorganic, bio-organic, bio-physical, bio-polymer, and bio-materials; Environmental – lab and field methods for rapid analysis of hazardous materials, petroleum, and pesticides, pollution prevention, chemical waste treatment and recycling; Inorganic – bioinorganic and coordination chemistry, catalysis, crystal growth and structure, organometallic and transition metal chemistry, physical methods, solid state chemistry, structure determination, synthesis and characterization, and surface analysis; Organic – bioorganic, medicinal and toxicological chemistry, natural products, synthetic and physical organic chemistry, and organic polymer chemistry; Physical – kinetics, biophysical chemistry, spectroscopy, physical methods, theoretical chemistry, thermodynamics, x-ray crystal structure; and Polymer – organic and inorganic polymers, and synthesis and characterization of materials. A detailed description of the research programs of individual faculty members is available in a departmental brochure, a copy of which may be obtained by writing to the department.

In addition to the basic requirements for admission to the Graduate School, an applicant should submit scores from the General and the Advanced Test in Chemistry of the Graduate Record Examinations at the time of application. All entering graduate students must take comprehensive proficiency examinations in analytical, inorganic, organic, and physical chemistry at the advanced undergraduate level. The results of these examinations are used to determine the appropriate course level for the student.

The student must qualify in the four areas listed above either by passing the proficiency examinations upon entry, or by earning a grade of B or higher (not B-) in a graduate course in the discipline(s) in which the examination was not passed. Students lacking undergraduate background in an area, may elect to take an undergraduate course or sequence and retake the proficiency examination. Students who do not qualify for

admission to the Ph.D. program may be allowed to continue towards a master's degree.

**Requirements for the Ph.D. Degree.** There are no specific course requirements for the Ph.D. degree in chemistry beyond those established by the student's advisory committee. The department has starred (\*) courses in each of the divisions as guidelines in preparing for the Ph.D. general examination, and ordinarily students are also expected to demonstrate reasonable competence in an area or areas outside their major program emphasis.

After the successful completion of the qualification requirements (see above), the student must pass the General Examination for the Ph.D. degree, consisting of a written and an oral portion as determined by the student's chosen Division (analytical, biological, environmental, inorganic, organic, physical and polymer). The General Examination (see the department's Graduate Student Handbook for details) usually is completed during the second or third year of graduate study.

Students working toward the Ph.D. degree must complete the related area or foreign language requirement of the Graduate School before taking the Ph.D. General Examination. Foreign languages appropriate for fulfilling this requirement include: Chinese, French, German, Japanese, Korean, Russian, and Spanish. Upon passing the written portion of the General Examination, the student takes an oral examination based on a research proposal written by the student.

The Ph.D. dissertation must contain the results of original research in chemistry and make a substantial contribution to the particular field. Upon completion of the dissertation, the student takes an oral examination in its defense.

**Special Facilities.** In addition to the usual equipment in a department of chemistry, the facilities available for research include: electrochemical instrumentation, electron spin resonance (esr) instruments, FT-IR and Raman spectrometers, high resolution FT-NMR, gas and liquid chromatographs, flash photolysis apparatus, laser spectroscopy instrumentation (atomic and molecular), Mössbauer instruments, magnetic susceptibility balances, mass spectrometers, 400 and 270 MHz nuclear magnetic resonance spectroscopy, polymer preparation and characterization instrumentation, GC-MS, surface analysis equipment (Auger, SAM, XPS, ISS-SIMS), scanning electron microscope, thermal analysis equipment, ultra-high temperature and pressure equipment, uv-visible spectrophotometers, spectrofluorimeters, and x-ray diffraction equipment. Molecular graphics work stations and general computing facilities are available within the Department; computer services are also available at the University of Connecticut Computer Center on campus. Some faculty members are also members of the University's Materials Science Institute or the Environmental Research Institute where additional research facilities are available, especially for polymer synthesis, characterization, and processing, or environmental analysis and research, respectively.

## COURSES OF STUDY

### †CHEM 300. Independent Study

*1 – 3 credits, Independent Study. Instructor consent required.*

### CHEM 305. Computerized Modeling in Science

Development and computer-assisted analysis of mathematical models in chemistry, physics and engineering. Topics include chemical equilibrium, reaction rates, particle scattering, vibrating systems, least squares analysis and quantum chemistry.

*4 credits, Lecture. Instructor consent required.*

### †CHEM 310. Seminar

Reports and discussion of topics of current interest in a variety of fields of chemistry.

*1 credit, Seminar.*

### CHEM 311. Research Methods

An introduction to the operations of major department instruments and to the applications of these to research.

*1 – 3 credits, Practicum. Instructor consent required.*

### CHEM 316. Crystal Growth of Inorganic Compounds

Theory and problems of crystal growth of inorganic compounds and factors affecting morphology and habit; thermodynamic and phase equilibria factors important in the growth from different media; extensive discussion of practical techniques of crystal growth.

*3 credits, Lecture.*

### CHEM 324. Advanced Inorganic Chemistry I

Synthetic methods in inorganic chemistry; the application of physical methods to the investigation of inorganic compounds.

*3 credits, Lecture.*

### CHEM 325. Advanced Inorganic Chemistry II

In depth study of general principles of inorganic chemistry; the structure of the elements and of inorganic compounds; group theory; different approaches to understanding the chemical bond.

*3 credits, Lecture. Prerequisite: CHEM 324.*

### CHEM 326. Advanced Inorganic Chemistry III

Main group and transition metal compounds with inorganic and organic ligands; the study of the transition metals is in preparation for Chemistry 327.

*3 credits, Lecture. Prerequisite: CHEM 325.*

### CHEM 327. Advanced Inorganic Chemistry IV

Transition metal chemistry; organometallic and coordination compounds of the transition elements, including the lanthanides and actinides; selected topics in bioinorganic chemistry.

*3 credits, Lecture. Prerequisite: CHEM 326.*

**CHEM 335. Theoretical Analytical Chemistry**

A problem oriented course, involving hands on computer use, which incorporates modern methods of analyzing data obtained from the various analytical techniques. Use of theoretical and empirical models and chemometrics is stressed.

3 credits, Lecture.

**CHEM 336. Electroanalytical Chemistry**

A study of the theoretical and practical basis for electroanalytical methods. Topics include voltammetric methods of analysis (including polarography, cyclic voltammetry, rotating disk voltammetry, pulse and square-wave methods, and stripping analysis), coulometric, and chronoamperometric methods. Recent advances using micro- and modified electrodes, thin-layer and flow cells, electrochemical sensors and detectors, and bioelectrochemistry may be included.

3 credits, Lecture.

**CHEM 337. Optical Methods of Analysis**

A discussion of fundamental principles, instrumentation and applications of some spectroscopic techniques of analytical chemistry including Raman spectroscopy, molecular fluorescence spectroscopy, atomic spectroscopy.

3 credits, Lecture.

**CHEM 338. Separation Methods**

A study of the theoretical and practical basis for modern separation methods. Topics to be discussed include the various methods dealing with gas-liquid, liquid-liquid, liquid-solid, gas-solid, ion-exchange, size exclusion, chromatography, electrophoresis, and mass spectrometry.

3 credits, Lecture.

**CHEM 340. Electronic Interpretation of Organic Chemistry**

Approaches to writing organic reaction mechanisms

1 credit, Lecture.

**CHEM 341. Advanced Organic Chemistry**

This course will review the fundamentals of bonding, stereochemistry and conformations and basic reactions from undergraduate organic chemistry. These fundamental principles will then be elaborated to include more advanced concepts of reactions and reactivity.

3 credits, Lecture.

**CHEM 343. Organic Reactions**

Nomenclature. Classes of compounds. A focus upon those reactions in which C-C bonds are formed. Emphasis on the fundamentals of each reaction, their utility and applications. A background of functional group exchanges; reaction control by steric, electronic, and topological considerations

4 credits, Lecture.

**CHEM 344. Concepts in Organic Chemistry**

Structure and mechanism. Such topics as chemical bonding, stereochemistry, conformation, molecular orbital theory and applications, acids and bases, and study of organic reaction mechanisms, including kinetics, substitutions, rearrangements and photochemical reactions.

3 credits, Lecture. Prerequisite: CHEM 343.

**CHEM 345. Determination of Organic Structures**

Structural problem solving using fundamental data including spectroscopic and wet chemical techniques.

3 credits, Lecture. Prerequisite: CHEM 343.

**CHEM 347. Organic Synthesis**

An investigation of efficient strategies for the synthesis of natural and unnatural organic molecules. Topics include: retrosynthetic analysis, synthetic strategies, common carbon-carbon bond formation reactions, multiple bond disconnection strategies (applications of pericyclic reactions), organometallic coupling reactions, radical and carbene reactions in organic synthesis, strategies to construct carbocyclic and heterocyclic ring systems.

3 credits, Lecture. Prerequisite: CHEM 343 and CHEM 344.

**CHEM 349. Readings in Organic Chemistry**

Informal discussions of the current literature. Formal oral presentations of current topics.

1 credit, Lecture.

**CHEM 351. Quantum Chemistry I**

The concepts of the quantum theory starting with an historical introduction and proceeding to the formulation of the Schrödinger equation and its exact solutions. Other topics include group theory, angular momentum, and approximate methods with applications to atomic and molecular structure and spectroscopy.

3 credits, Lecture.

**CHEM 352. Quantum Chemistry II**

Selected topics in quantum chemistry, building on the concepts developed in Chemistry 351.

3 credits, Lecture. Prerequisite: CHEM 350 or CHEM 351.

**CHEM 353. Chemical Kinetics**

The empirical and theoretical treatment of reaction rates. Experimental methods and treatment of data. Simple kinetic forms. Deduction of reaction mechanisms. Reaction energetics. Theories of elementary reaction rates. Diffusion. Homogeneous and heterogeneous catalysis. Extrakinetic probes of mechanism.

3 credits, Lecture.

**CHEM 354. Photochemistry**

The interaction of light with organic and inorganic molecules. Dynamical processes of excited states. Kinetics and mechanism of photochemical reactivity. Excimers. Lasers.

Experimental techniques.

3 credits, Lecture. Prerequisite: CHEM 350 or CHEM 351.

**CHEM 355. Chemical Thermodynamics**

An understanding of the standard methods of calculus, e.g. partial differentiation, is required. Classical thermodynamics applied to pure substances and solutions.

3 credits, Lecture.

**CHEM 356. Statistical Thermodynamics**

The relationship between the micro and macro world is explored and discussed.

3 credits, Lecture. Prerequisite: CHEM 355.

**CHEM 359. Introduction to X-ray Crystallography**

Crystallographic symmetry including macroscopic and microscopic symmetry elements, point groups and space groups. Microscopic examination of crystals. Interaction of X-rays with matter. Powder diffraction methods and identification of crystalline substances. Single crystal diffraction techniques and methods of structure determination.

3 credits, Lecture.

**CHEM 360. Biological Chemistry I**

Recent advances in understanding the mechanisms of chemical processes in biological systems. Chemical perspectives or problems of biological significance at the interfaces of the various divisions of chemistry.

3 credits, Lecture. Instructor consent required.

**CHEM 361. Biological Chemistry II**

Selected topics in Biological Chemistry building on the concepts developed in Chemistry 360.

1 - 3 credits, Lecture. Instructor consent required.

**CHEM 370. Environmental Chemistry I**

Recent advances in studies of sources, reactions, transport, effects and fate of chemical species in air, water and soil environments. Emphasis on analytical methods for studying environmental phenomena and sampling methods.

3 credits, Lecture.

**CHEM 371. Environmental Chemistry II**

Environmental sampling and methods of chemical contaminant analyses, sources and types of chemical pollution, pollution prevention, waste management, waste reduction, recycling, and ultimate chemical destruction.

3 credits, Lecture. Prerequisite: CHEM 370.

**CHEM 380. Polymer Synthesis**

Chemistry of the formation of high polymers, including kinetics, mechanisms, and stereochemistry of step growth and addition polymerization. Recent advances in polymer synthesis.

3 credits, Lecture.

**CHEM 381. Polymer Physical Chemistry**

A molecular description of the fundamental



physico-chemical aspects of polymer solutions and solids. Considers thermodynamics, chain statistics, dynamics, and structure of polymer molecules.

3 credits, Lecture.

#### CHEM 382. Polymer Characterization I

Experimental techniques for characterizing polymers on a molecular level, with emphasis on the provision of a working knowledge of instrumental analysis. Experiments include dilute solution viscosity, vapor pressure osmometry, gel permeation chromatography, chemical and spectroscopic analysis.

3 credits, Lecture.

#### CHEM 384. Polymer Characterization II

Experimental techniques for characterizing polymers on a macroscopic scale, with emphasis on provision of a working knowledge of instrumental analysis. Experiments include calorimetry, mechanical analysis, surface characterization, and structure determination.

3 credits, Lecture.

#### CHEM 385. Reactions of Polymers

A comprehensive coverage of theories of reactions of high polymers, as applied to reaction mechanisms and the relationships of structure with physical properties and reactivity. Topics include modification of polymers, degradation of polymers, polymer reagents and polymer catalysis.

3 credits, Lecture.

#### CHEM 386. Microscopy and Morphology of Polymers

Instrumental methods of optical and electron microscopy and their applications to the study of polymers, including polarized light, phase contrast, interference, dark field, micro-thermal analysis, automatic image analysis, photomicrography and micrometry; electron microscopy. Applications to measuring optical properties of polymers, birefringence, orientation, polymer single crystals and polymer texture.

3 credits, Lecture.

#### CHEM 387. Polymer Photophysics and Photochemistry

Lectures and experimental projects on molecular photochemistry and photophysics of polymers. Topics include fluorescence energy transfer and migration, excimers, phosphorescence, photo- and radiation chemistry of polymers.

3 credits, Lecture. Prerequisite: CHEM 381.

#### CHEM 388. Infrared Spectroscopy of Polymers

The nature of the interaction of IR radiation with molecules, modern spectrometer design, non-conventional sampling techniques, and applications to polymer-related problems.

3 credits, Lecture.

#### CHEM 393. Special Topics in Physical Chemistry

1 - 3 credits, Lecture. Instructor consent required.

#### CHEM 394. Special Topics in Polymer Chemistry

1 - 3 credits, Lecture. Instructor consent required.

#### CHEM 395. Special Topics in Analytical Chemistry

1 - 3 credits, Lecture.

#### CHEM 396. Special Topics in Inorganic Chemistry

1 - 3 credits, Lecture.

#### CHEM 397. Special Topics in Organic Chemistry

1 - 3 credits, Lecture. Prerequisite: CHEM 343.

#### †GRAD 395. Master's Thesis Research

1 - 9 credits.

#### †GRAD 396. Full-Time Master's Research

3 credits.

#### †GRAD 397. Full-Time Directed Studies (Master's Level)

3 credits.

#### GRAD 398. Special Readings (Master's)

Non-credit.

#### GRAD 399. Thesis Preparation

Non-credit.

#### †GRAD 495. Doctoral Dissertation Research

1 - 9 credits.

#### †GRAD 496. Full-Time Doctoral Research

3 credits.

#### †GRAD 497. Full-Time Directed Studies (Doctoral Level)

3 credits.

#### GRAD 498. Special Readings (Doctoral)

Non-credit.

#### GRAD 499. Dissertation Preparation

Non-credit.

## CIVIL ENGINEERING

Department Head: Professor Erling Smith  
Associate Department Head & Graduate Program

Director: Associate Professor Ramesh B. Malla  
Professors: Accorsi, Davis, DeWolf, Epstein, Frantz, Hoag, and Or

Associate Professors: Abboud, Demars, Garrick, Ivan, Nikolaidis, Ogden, Smets, and Uthgennant  
Assistant Professors: Anagnostou, Aultman-Hall, Holmén, and MacKay

Adjunct Professors: Grasso and Nikolaidis

Adjunct Associate Professor: Curtis

The Department of Civil and Environmental Engineering offers graduate courses and research opportunities for students seeking the M.S. or Ph.D. Research areas include environmental, geotechnical, structural and transportation engineering. In addition, the Department participates in interdisciplinary programs in applied mechanics, environmental engineering and fluid dynamics.

**Special Requirements for the Master's Degree.** Master's degrees may be earned under either of two plans. Plan A requires not fewer than 21 credits of graduate program course work and the writing of a Thesis, while Plan B requires not fewer than 30 credits of graduate program course work and a final examination (but no thesis). For outstanding students who have completed six credits of approved graduate-level course work (300's level or higher) as part of an undergraduate program (as electives and/or as professional requirements) prior to entry to the master's degree program (with grades of *B+* or higher in all such courses) the advisory committee may reduce the course work to 15 credits for Plan A and to 24 credits for Plan B.

**Special Requirements for the Ph.D. Program.** By the end of the first year of study, the Ph.D. student must have passed a qualifying examination and have submitted evidence of his or her capacity for independent study in the form of a master's thesis or a comparable achievement. In many cases the final examination of the student's M.S. program serves as the qualifying examination (See also "Applied Mechanics" and "Fluid Dynamics.")

**Special Facilities.** The Department has fully-equipped, state-of-the-art laboratories for graduate research in applied mechanics, environmental, geotechnical, structural and transportation engineering. In addition to the typical laboratories, special departmental facilities include a 40' x 65' fully-equipped structures testing strong floor, state-of-the-art computer lab for computer aided design (CAD) and geographical information systems (GIS) laboratory, specialized asphaltic and bituminous materials laboratories and controlled environment rooms for both environmental and geotechnical research laboratories. Equipment is also available for conducting experimental research in the field. Specialized laboratories of the Environmental

Research Institute (ERI) are also available for research in environmental engineering. Departmental research is funded by national and state agencies and by the private sector.

**Special Courses.** For additional mathematical analysis and fluid mechanics courses students should consider ME 307, 308, and 312.

## COURSES OF STUDY

### CE 300. Independent Graduate Study in Civil Engineering

Special problems in civil engineering as arranged by the student with a supervisory instructor of his or her choice.

*1 – 6 credits, Independent Study. Instructor consent required.*

### CE 301. Engineering Aspects of Urban and Regional Planning

Growth patterns, land use, transportation location and development, municipal utilities. Geographic Information Systems.

*3 credits, Lecture.*

### CE 302. Case Studies in Transportation Engineering

Analysis of transportation case studies in transportation design, and transportation and land use planning. Application of transportation engineering and planning skills. Oral and written group reports, group discussions, individual papers.

*3 credits, Lecture. Department consent required. Not open to students who have passed CE 255.*

### CE 304. Probabilistic Methods in Engineering Systems

Common probabilistic models used in engineering and physical science design, prediction, and operation problems; derived distributions, multivariate stochastic models, and estimation of model parameters; analysis of data, model building and hypothesis testing; uncertainty analysis

*3 credits, Lecture. Also offered as ENVE 304.*

### CE 305. Transportation and Air Quality

Mobile source emissions models in theory and practice. Regulatory framework. Emissions control technology. Field and laboratory measurement techniques. Roadway dispersion modeling. Current topics in mobile source emissions.

*3 credits, Lecture. Also offered as ENVE 305.*

### CE 312. Civil Engineering Graduate Seminar

Presentation and discussion of advanced civil engineering problems.

*1 credit, Lecture.*

### CE 320. Advanced Topics in Civil Engineering

Classroom or laboratory courses as announced for each semester. For independent study, see Civil Engineering 300.

*1 – 3 credits, Lecture. Instructor consent required.*

### CE 322. Advanced Mechanics of Materials

Stress and strain, combined stress, and theories of failure. Torsion of non-circular sections. Shear center, unsymmetrical bending, curved flexural members, and beams on elastic foundations.

Energy methods.

*3 credits, Lecture.*

### CE 324. Applied Elasticity

Theory of elasticity; two-dimensional solutions of beams, wedges, disks, and rings under load; stress concentrations; strain-energy methods; torsion of bars; stresses in bodies of revolution.

*3 credits, Lecture.*

### CE 325. Plates and Shells

Stresses and deformations in flat plates and curved shells; bending of circular and rectangular plates; energy methods; buckling; shells of revolution.

*3 credits, Lecture.*

### CE 326. Elastic Stability

Buckling of elastic and inelastic columns; lateral buckling of beams; buckling of plates, rings and tubes; stability of frames.

*3 credits, Lecture.*

### CE 327. Numerical Methods in Civil Engineering

Solution of linear and nonlinear systems of equations and algebraic eigenvalue problems. Interpolation, numerical integration, and regression. Ordinary and partial differential equations by finite difference method. Computer programming.

*3 credits, Lecture. Instructor consent required.*

### CE 332. Advanced Fluid Mechanics I

Dimensional analysis; vector analysis, circulation and vorticity; irrotational motion and velocity potential; two-dimensional flow and stream function; complex variable theory; conformal mapping; airfoils; sources and sinks; free streamline flow; water waves; three-dimensional flow.

*3 credits, Lecture. Also offered as ENVE382.*

### CE 334. Advanced Fluid Mechanics II

Turbulent boundary layer. Dimensional analysis. Free shear flows. Flows in pipes and channels. Boundary layers on smooth and rough surfaces.

*3 credits, Lecture. Also offered as ENVE 383.*

### CE 338. Open Channel Hydraulics

Unsteady, nonuniform flow; energy and momentum concepts; flow control; de St. Venant equations; unsteady flow modeling of channels and natural rivers.

*3 credits, Lecture. Also offered as ENVE 384.*

### CE 341. Advanced Soil Mechanics

Principles of soil mechanics, effective stresses, shear strength, consolidation, permeability, seepage effects, phase relations.

*3 credits, Lecture.*

### CE 343. Advanced Foundation Design

Soil behavior in retaining systems, shallow foundations, deep foundations.

*3 credits, Lecture.*

### CE 344. Geosynthetics in Geotechnical Design

The properties of geotextiles, geomembranes, geocomposites, and geogrids and their use in road construction, retaining structures, drainage, hazardous waste sites, etc. Design, testing and selection.

*3 credits, Lecture.*

### CE 345. Earth Structures

Embankments, earth dams, earth and rock slopes, consolidation, vertical drains, soft deposits, landslides, subsurface investigations.

*3 credits, Lecture.*

### CE 346. Ground Water Flow and Drainage

Permeability, flow nets, ground water flow and filter design, excavation dewatering, foundation drains, slope stabilization, highway drainage.

*3 credits, Lecture.*

### CE 347. Soil Behavior

Clay mineralogy and interfacial properties, electro-osmosis, thixotrophy, shear strength, consolidation, permeability, frost heave, and swelling.

*3 credits, Lecture.*

### CE 348. Soil Settlement and Consolidation

Settlement predictions, theories of consolidation, secondary compression, numerical solutions, analysis of field data.

*3 credits, Lecture.*

### CE 349. Soil Shear Strength

Failure theories for particulate media, plastic equilibrium, laboratory testing and interpretation.

*3 credits, Lecture.*

### CE 351. Classical Structural Analysis

Classical indeterminate analysis, displacement analysis, consistent deformations, energy methods, elastic center and column analogy, slope-deflection, moment and shear distribution, second order effects.

*3 credits, Lecture.*

### CE 352. Bridge Structures

Steel, reinforced concrete, prestressed concrete, and girder, box girder bridges; curved bridges; loadings; durability; fatigue; vibrations. Design project.

*3 credits, Lecture.*

### CE 353. Advanced Steel Structures

Behavior, stability and design of steel columns, beams, beam-columns, plates, bracing, frames; torsional behavior; fatigue and brittle fracture; review of design specifications.

*3 credits, Lecture.*

**CE 354. Prestressed Concrete Structures**

Analysis, design, and behavior of pretensioned and post-tensioned concrete; simple and continuous span structures; time dependent behavior; review of design specifications.  
*3 credits, Lecture.*

**CE 355. Advanced Reinforced Concrete Structures**

Behavior and design of reinforced concrete for flexure, shear, torsion, bond, and axial loads; two way slabs; beam-column joints; general flexure theory; seismic considerations; review of design specifications.  
*3 credits, Lecture.*

**CE 356. Thin Shell Concrete Structures**

Folded plate structures, barrel shells, hypars, shells of revolution and translation, strength, stability and deflections; methods of construction.  
*3 credits, Lecture.*

**CE 357. Nonlinear Structures**

Plastic and inelastic analysis of beams, frames, grids, plates and slabs; plastic hinge, collapse configurations, upper and lower bound theorems, deflection, incremental collapse; nonlinear analysis methods.  
*3 credits, Lecture.*

**CE 358. Theory of Shells**

Curvilinear coordinates. Surface geometry. Thin shell theory. Comparison of various theories. Shells of revolution. Variational principles. Approximate methods. Shallow shell theory.  
*3 credits, Lecture.*

**CE 359. Structural Vibrations**

Vibrating systems; application to design; discrete and continuous systems, free and forced vibrations; response to periodic and non-periodic loads; analytical and numerical techniques; earthquake loading; response spectra.  
*3 credits, Lecture.*

**CE 360. Matrix Analysis of Structures**

Matrix methods; force and displacement methods; energy principles; analysis of indeterminate structures, rigid frames, trusses and grids; settlement of supports, lack of fit, and temperature stresses; computer programming.  
*3 credits, Lecture.*

**CE 361. Advanced Matrix Analysis of Structures**

Review of matrix methods. Methods of substructures and modification of structures, and structural synthesis; non-prismatic and non-linear structures; buckling and vibrations of structures. Computer programming.  
*3 credits, Lecture.*

**CE 362. Finite Element Method in Engineering**

Calculus of variations, Euler-Lagrange, Rayleigh-Ritz methods. Least energy and virtual work principles. Application to heat and wave

propagation, fluid and solid mechanics problems, time-space and eigenvalue problems.

*3 credits, Lecture. Instructor consent required. Prerequisite: CE237 or CE 360.*

**CE 363. Finite Element Analysis**

Analysis of structures using plane stress, plane strain, plate and solid finite elements. Applications using available programs.  
*3 credits, Lecture.*

**CE 364. Ductility of Reinforced Concrete**

Design for ductility; limit design; yield line analysis; seismic considerations.  
*3 credits, Lecture.*

**CE 365. Advanced Finite Element Analysis**

Modal and transient dynamic analysis. Implicit and explicit algorithms and stability analysis. Fluid-structure interaction. Nonlinear solution algorithms. Contact analysis using Lagrange multiplier and penalty methods. Hierarchical finite element method. Infinite elements. Applications using commercial finite element code.  
*3 credits, Lecture.*

**CE 370. Transportation Planning**

Transportation economics, urban transportation planning process, local area traffic management, evaluation of transportation improvements, land use and transportation interaction.  
*3 credits, Lecture.*

**CE 371. Highway Engineering - Design**

Urban street and highway design: vertical and horizontal alignment, cross-section elements, traffic barriers, interchanges and intersections, pedestrian and bike facilities, traffic calming, community and roadside elements.  
*3 credits, Lecture.*

**CE 372. Bituminous Materials**

Properties, performance and design of bituminous materials for highway and airport paving; physical and chemical properties of binders; testing methods; specifications; production and construction.  
*3 credits, Lecture. Instructor consent required.*

**CE 373. Pavement Design**

Analysis and design of flexible and rigid pavements; testing and characterization of paving materials.  
*3 credits, Lecture.*

**CE 378. Traffic Engineering Characteristics**

Relationships among traffic flow characteristics; microscopic and macroscopic representations of traffic flow; capacity of highways; traffic stream models; shock wave analysis; queueing analysis; traffic simulation.  
*3 credits, Lecture.*

**CE 379. Traffic Engineering Operations**

Driver, pedestrian and vehicle operating

characteristics. Traffic data collection. Accident and safety analysis. Highway capacity analysis. Traffic signs and markings. Traffic signal timing and operation. Traffic management.  
*3 credits, Lecture.*

**CE 380. Travel Demand Forecasting**

Alternative formulations and calibration of trip generation, trip distribution and travel mode choice prediction models. Traffic network equilibrium and assignment.  
*3 credits, Lecture.*

**CE 381. River Mechanics**

Erosion and sedimentation, physical properties of sediment, dimensional analysis, mechanics of sediment laden flows, particle motion, incipient motion, bedforms, bed load, suspended load.  
*3 credits, Lecture.*

**CE 383. Hydrometeorology**

Global dynamics of aquatic distribution and circulation. Hydrologic cycle, atmospheric circulation, precipitation, interception, storage, infiltration, overland flow, distributed hydrologic modeling, and stream routing  
*3 credits, Lecture. Also offered as ENVE 385.*

**CE 384. Hydraulic Machinery and Transients**

Pumps and turbines. Surging, water hammer, cavitation, hydraulic machinery for hydroelectric plants, water supply, irrigation, and river navigation.  
*3 credits, Lecture. Also offered as ENVE 386.*

**CE 385. Hydraulic Structures**

River regulation and development. Hydroelectric plants, storage and turbines, canals, locks, and penstocks, dams, regulation of power, flood control, navigation and irrigation.  
*3 credits, Lecture. Also offered as ENVE 387.*

**CE 386. The Flood Problem**

Flood hazards. Preventing or alleviating damages. Flood frequency analysis. Effect of land-use/land-cover and soil moisture on flooding. Remote sensing in flood prediction. Flood and dam-break modeling. Multiple purpose projects.  
*3 credits, Lecture.*

**CE 387. Environmental Physicochemical Processes**

Reactor dynamics, applications of interfacial phenomena and surface chemistry, processes for separation and destruction of dissolved and particulate contaminants. Scholarly reviews.  
*3 credits, Lecture. Also offered as ENVE 321.*

**CE 388. Environmental Biochemical Processes**

Major biochemical reactions; stoichiometric and kinetic description; suspended and attached growth modeling; engineered biotreatment systems for contaminant removal from aqueous, gaseous, and solid streams; process design.  
*3 credits, Lecture. Also offered as ENVE 322.*



**CE 389. Environmental Transport Phenomena**  
Movement and fate of chemicals: interfacial processes and exchange rates in environmental matrices.

*3 credits, Lecture. Also offered as ENVE 310.*

**CE 390. Environmental Engineering Chemistry - I**

Quantitative variables governing chemical behavior in environmental systems. Thermodynamics and kinetics of acid/base coordination, precipitation/dissolution, and redox reactions.

*3 credits, Lecture. Also offered as ENVE 300.*

**CE 391. Advanced Environmental Engineering Laboratory**

Analysis of water and waste water. Experimental laboratory and plant investigation of water, wastewater and industrial waste treatment processes.

*3 credits, Lecture. Also offered as ENVE 302.*

**CE 392. Industrial Wastes**

Origin and characteristics of industrial wastes. Engineering methods for solving industrial waste problems.

*3 credits, Lecture. Also offered as ENVE 324.*

**CE 394. Biodegradation and Bioremediation**

Biochemical basis of the transformation of key organic and inorganic pollutants; quantitative description of kinetics and thermodynamics of pollutant transformation; impact of physiochemical and ecological factors on biotransformation.

*3 credits, Lecture. Also offered as ENVE 306.*

*Prerequisite: CE 390 or ENVE 300, and CE 490 or ENVE 301.*

**†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

**†GRAD 396. Full-Time Master's Research**

*3 credits.*

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**CE 400. Seminar in Environmental Sciences and Engineering**

Extended discussions on presentations contributed by staff, students and outside speakers. A certificate of completion will be issued from the Environmental Engineering Program.

*1 credit, Seminar. Also offered as ENVE 400.*

**CE 401. Ocean Engineering I**

Dynamics of the ocean, including waves, tides and currents; shore processes and protection works; chemical and physical characteristics of seawater; estuarine flushing, mixing and diffusion; sedimentation; engineering applications.

*3 credits, Lecture. Also offered as ENVE 389.*

**CE 403. Wastewater Engineering for Unsewered Areas**

Management, planning and design criteria. Recycling, water consumption reduction, soil clogging and treatment methods. Pollutational loads and treatability of each pollutant.

*3 credits, Lecture. Also offered as ENVE 325.*

**CE 404. Solid Waste Engineering**

Methods of collection, transport and disposal, design of solid waste treatment, disposal and recycle systems, management, pollution effects, literature research.

*3 credits, Lecture. Also offered as ENVE 326.*

**CE 405. Environmental Systems Modeling**

Modeling pollutants in natural surface waters. Advective, dispersive, and advective-dispersive systems. Modeling water quality, toxic organic and heavy metals pollution.

*3 credits, Lecture. Also offered as ENVE 311.*

**CE 406. Groundwater Flow Modeling**

Basics of modeling with Finite Difference and Finite Element Methods. Modeling flow in saturated and unsaturated zones. Model calibration and validation. Parameter estimation. Treatment of heterogeneity. Basic geostatistics. Modeling surface-groundwater interactions. Application to field sites.

*3 credits, Lecture. Also offered as ENVE 388.*

*Prerequisite: CE 410 or ENVE 320.*

**CE 407. Subsurface Contaminant Transport Modeling**

Fate and transport of contaminants in groundwater. Convection, dispersion, adsorption, and biological and radioactive decay. Field scale modeling. Galerkin finite elements. Application to field sites.

*3 credits, Lecture.*

**CE 408. Transport and Transformation of Air Pollutants**

Transport and deposition of gaseous and aerosol pollutants; chemical formation and reactions of oxidants and acidic compounds.

*3 credits, Lecture. Also offered as ENVE 343.*

*Prerequisite: CE 390 or ENVE 300.*

**CE 410. Ground Water Assessment and Remediation**

Quantitative evaluation of field data in assessing nature and extent of groundwater contamination. Subsurface control and remediation. Case studies.

*3 credits, Lecture. Also offered as ENVE 320.*

**CE 411. Contaminant Source Remediation**

Regulatory framework. Soil clean-up criteria. Treatment technologies: soil vapor extraction, solidification - stabilization, soil washing - chemical extraction, hydrolysis - dehalogenation, thermal processes, bioremediation. Risk analysis.

*3 credits, Lecture, Also offered as ENVE 323.*

*Prerequisite: CE 387 or ENVE 321, and CE 388 or ENVE 322.*

**CE 490. Environmental Engineering Chemistry - II**

Environmental organic chemistry: ideal and regular solution thermodynamics; linear free energy relations; estimation of vapor pressure, solubility, and partitioning behavior; abiotic organic compound transformations; chemical fate modeling.

*3 credits, Lecture. Also offered as ENVE 301.*

*Prerequisite: CE 390 or ENVE 300*

**†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

**†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

## COMMUNICATION SCIENCES

*Department Head:* Professor Harvey R. Gilbert

*Professors:* Buck and Musiek

*Associate Professors:* Coelho, Hamilton, Jalbert, Snyder, and VanLear

*Assistant Professors:* Cienkowski, Cornetto, D'Alessio, Farrar, Gaztambide-Geigel, Grela, Johnson, Krcmar, Moncrieff, Max, Nowak, and Rios

The field of communication science deals with the process and analysis of human communication. The Department of Communication Sciences has two major sections: Communication Disorders and Communication Processes, each of which offer M.A. and Ph.D. degree programs. The Communication Disorders Section offers both M.A. and Ph.D. concentrations in Speech, Language, and Hearing. The Communication Processes Section offers an M.A. concentration in Communication and a Ph.D. concentration in Communication Processes and Marketing Communication.

**Communication Disorders.** Three areas of emphasis leading to the M.A. degree are offered in the concentration of speech, language, and hearing: (1) speech-language pathology, (2) audiology, and (3) the general emphasis. Students may elect either the thesis or non-thesis option in speech-language pathology and/or audiology. The general emphasis requires a thesis. The emphases in speech-language pathology and audiology lead to clinical certification and are accredited by the American Speech-Language Hearing Association's (ASHA), Council on Academic Accreditation (CAA). The general emphasis is designed for students interested in speech, language, and hearing processes and their disorders, but not planning a career as certified clinicians. The mission of these areas of emphasis is to provide an understanding of human communication disorders and their clinical management emphasizing a scientific approach. Academic courses and clinical education experiences encourage a theoretical perspective and experimental orientation to develop an appreciation of current knowledge and future research needs.

The Ph.D. also is offered in the area of concentration of speech, language, and hearing. Five areas of emphasis within this concentration are available: (1) speech pathology, (2) language, (3) audiology, (4) speech science, and (5) hearing science. Doctoral students are expected to obtain a broad mastery of the area of concentration (speech pathology and audiology) and an in-depth knowledge of one of the five emphases through advanced course work and research.

**Communication.** Master's level work in communication emphasizes the empirical investigation of human communication. Students receive a basic foundation in communication theory and research methodology. Those pursuing the M.A. in communication prepare to carry out independent research in communication and to

evaluate communication programs, either at institutions offering doctoral-level work in communication or in business or government. Areas of emphasis include: (1) general communication theory; (2) organizational communication; (3) mass communication; (4) interpersonal communication; (5) marketing communication; and (6) new communication technology (12-month course of study). Ample experimental and survey research facilities are available.

The Ph.D. in the Communication Processes and Marketing Communication area of concentration provides the student with strong theoretical and research skills to prepare for an academic career or professional research position. Research areas include: media effects, persuasion, emotional, intercultural, international, nonverbal, organizational, political, relational, and small group communication; public opinion, health communication campaigns, new communication technology, advertising, social marketing, and consumer research.

### COURSES OF STUDY

#### Communication

##### COMM 300. Independent Study in Communication Science

This course is an independent study course in which periodic conferences with the instructor are required.  
*1 - 6 credits, Independent Study. Formerly COMS 300.*

##### COMM 302. Research Methods

Integrative approach to modeling theory, research design, and statistical analysis, including mathematical models, scale construction, measurement issues, correlation, regression, and analysis of variance.  
*3 credits, Lecture. Formerly COMS 302.*

##### COMM 303. Advanced Communication Research Methods

Research techniques and procedures for the study of communication. Research design, multivariate statistics, and structural modeling.  
*3 credits, Lecture. Formerly COMS 306.*  
*Prerequisite: COMM 302.*

##### COMM 305. Theory Construction and Research Design

Conceptualization, theory construction, and review of communication methodologies. Students will write a proposal for independent research, thesis, or dissertation.  
*3 credits, Lecture. Formerly COMS 325.*  
*Prerequisite: COMM 302.*

##### COMM 310. Persuasion Theory and Research

Evaluation of current and traditional theories of persuasion and attitude change from communica-

tion, social psychology, and related disciplines.  
*3 credits, Lecture. Formerly COMS 319.*

##### COMM 315. Communication Campaigns

Campaign theory and planning. Students learn how to conduct interviews and focus groups with members of a target audience, and work with non-profit organizations to design a campaign.  
*3 credits, Lecture. Formerly COMS 301.*

##### COMM 320. Interpersonal Communication

Cognitive, emotional and behavioral interactions in specific contexts, including interpersonal relationships, groups, and work.  
*3 credits, Lecture. Formerly COMS 308.*

##### COMM 322. Seminar in Speech

*1 - 6 credits, Seminar. May be repeated for credit. Formerly COMS 320.*

##### COMM 325. Group Communication Research

The group communication process with emphasis upon research methodologies for the study of interactions in a group setting.  
*3 credits, Lecture. Formerly COMS 313.*

##### COMM 326. Organizational Communication: Theory and Research

Relationship of prescribed and informal communication networks to organizational goal achievement and individual integration. Emphasis on frequently used research methodologies.  
*3 credits, Lecture. Formerly COMS 322.*

##### COMM 330. Mass Communication Theory

Introduction to major theories, with emphasis on the structure, function, and effects of mass media.  
*3 credits, Lecture. Formerly COMS 309.*

##### COMM 331. Seminar in Mass Communication Research

Recent theories of social and political effects of mass communication, and the cognitive processing of media messages.  
*3 credits, Seminar. Formerly COMS 371.*

##### COMM 340. Motivation

Theories of motivation considered in relation to their supporting data.  
*3 credits, Lecture. Also offered as PSYC 340. Formerly COMS 340.*

##### COMM 341. Political Communication

The media and the political process. Media and the electoral process: voter decision making, political advertising, and election debates. Media and the policy process: the impact of news on political institutions and domestic and international policy making, and the uses of media by interest groups. Media coverage of protest, political violence and terrorism.  
*3 credits, Lecture. Formerly COMS 310.*  
*Prerequisite: COMM 330.*

**COMM 350. Nonverbal Communication**

The study of metacommunication: Kinesics, space, time and other concomitants of verbal messages. How the non-verbal band helps in the interpretation of verbal messages.  
3 credits, Lecture. Formerly COMS 312.

**COMM 365. Seminar in Message Systems Analysis**

Selected topics in information and communication; analysis of message elements in human communication; discussion of message factors as related to behavioral effects.  
3 credits, Lecture. Formerly COMS 307.

**COMM 371. Computer Mediated Communication**

Communication networks, human-computer interaction and interface design, social and collaborative communication via computer.  
3 credits, Lecture. Formerly COMS 314.

**COMM 379. Computer Modeling in Communication Research**

History, basic concepts, and minimal skills of computer simulation and mathematical modeling.  
3 credits, Lecture. Formerly COMS 321.

**COMM 390. Practicum in Research**

1 – 6 credits, Practicum. May be repeated for credit. Formerly COMS 319.

**COMM 401. Proseminar in Communication Research**

Advanced topics in communication research presented by faculty and specialists. Topics include information theory, survey of sampling and data collection, time series analysis (time-domain and panel design), physiological measurement, interaction analysis, and meta analysis.  
3 credits, Seminar. Formerly COMS 401.  
Prerequisite: COMM 302, COMM 303, and COMM 305.

**COMM 402. Topics in Applied Communication Research**

Investigation of special research techniques and findings in selected areas of applied communication research.  
3 credits, Seminar. Formerly COMS 402.

**COMM 480. Seminar in Marketing Communication Research**

Theories of emotional and cognitive processing of communications; cognitive mapping and message construction; design, implementation and evaluation of information campaigns.  
3 credits, Seminar. Formerly COMS 405.

**COMM 490. Seminar and Directed Research in Communication**

1 – 6 credits, Seminar. Open to graduate students in the Marketing Communication program. May be repeated for credit for a maximum of 12 credits. Formerly COMS 404.

**Communication Disorders****CDIS 300. Independent Study in Communication Science**

This course is an independent study course in which periodic conferences with the instructor are required.  
1 – 6 credits, Independent Study.

**CDIS 319. Practicum in Research**

Practicum. May be repeated for credit.  
1 – 6 credits, Practicum.

**CDIS 335. Stuttering: Theory and Research**

3 credits, Lecture. Formerly COMS 335.

**CDIS 336. Clinical Practicum in Speech Disorders**

1 – 6 credits, Practicum.

**CDIS 337. Clinical Practicum in Hearing**

Discussion. May be repeated for credit.  
1 – 6 credits, Discussion. Formerly COMS 337.

**CDIS 338. Seminar in Childhood Hearing Impairment**

Weekly presentations on working with infants and young children with hearing impairment. Current research, team participation, and cultural diversity. May be repeated for credit with a change in content.  
3 credits, Seminar. Formerly COMS 338.

**CDIS 339. Aural Habilitation**

Communication assessment and management of children with hearing loss. Individualized rehabilitation plans, family education, and collaborative team models.  
3 credits, Lecture. Formerly COMS 339.

**CDIS 342. Aphasia**

The differential diagnosis of acquired neurogenic communication disorders as well as research, theory, and efficacy of language interventions for aphasia in adults.  
3 credits, Lecture. Formerly COMS 342.

**CDIS 343. Cognitive-Communicative Disorders**

Cognitive-communicative disorders in adults secondary to right hemisphere damage, traumatic brain injury, and dementia. Emphasis on differential diagnosis and theories and research pertaining to clinical management including the efficacy of interventions.  
3 credits, Lecture. Formerly COMS 343.

**CDIS 344. Pediatric Rehabilitative Audiology**

Auditory-based components of managing hearing loss in children; the role of the family and cultural environment in service delivery.  
3 credits, Lecture. Formerly COMS 344.

**CDIS 345. Motor Speech Disorders**

The effects of acquired and developmental neuropathology on speech. Emphasis on

differential diagnosis and clinical management.  
3 credits, Lecture. Formerly COMS 345.

**CDIS 346. Dysphagia**

Dysphagia secondary to neurologic impairments, cancer, and degenerative disease. Anatomy and physiology of normal and disordered swallowing, evaluation including instrumental assessment techniques, and multidisciplinary management.  
3 credits, Lecture. Formerly COMS 346.

**CDIS 348. Language Assessment**

The nature and assessment of delayed and deviant language behavior in children.  
3 credits, Lecture. Formerly COMS 348.

**CDIS 349. Language Management**

The management of language disordered children.  
3 credits, Lecture. Formerly COMS 349.

**CDIS 351. Amplification for Residual Hearing**

Introduction to hearing aids and assessment of the personal amplification needs of hearing-impaired individuals.  
3 credits, Lecture. Formerly COMS 351.

**CDIS 353. Articulation Disorders**

3 credits, Lecture. Formerly COMS 353.

**CDIS 354. Physiological and Psychological Acoustics**

Detailed analysis of auditory phenomena and their underlying physiological and psychological mechanism.  
3 credits, Lecture. Formerly COMS 354.

**CDIS 356. Audiological Assessment**

The development and administration of advanced pure-tone and auditory discrimination tests; the interpretation of audiometric findings for adults and children.  
3 credits, Lecture. Formerly COMS 356.

**CDIS 357. Organic Disorders of Communication**

Research and theory pertaining to speech and language disorders resulting from congenital structural anomalies.  
3 credits, Lecture. Formerly COMS 357.

**CDIS 358. Diagnostic Principles in Speech Pathology**

3 credits, Lecture. Formerly COMS 358.

**CDIS 359. Voice Disorders**

3 credits, Lecture. Formerly COMS 359.

**CDIS 360. Laboratory Instrumentation**

Presentation of basic concepts necessary for the application of electronic instrumentation to the study of speech and hearing. Description, analysis, and application of electronic and electro-acoustical instrumentation employed in communication science research.  
3 credits, Lecture. Formerly COMS 359.



**CDIS 361. Advanced Speech Science I**  
 Generation, transmission, detection, and analysis of the speech signal. Special attention is given to the myology of speech production and the physiological correlates of the acoustic output. Theoretical models of speech production are examined in light of recent empirical findings. Biomedical and other research techniques are employed in the laboratory setting to investigate the speech communication processes.  
*3 credits, Lecture. Formerly COMS 361.*

**CDIS 362. Advanced Speech Science II**  
 A continuation of CDIS361.  
*3 credits, Lecture. Formerly COMS 362.*  
*Prerequisite: CDIS 361.*

**CDIS 363. Seminar in Speech Pathology**  
 1-6 credits. Seminar. May be repeated for credit with a change in content.  
*1 - 6 credits, Seminar. Formerly COMS 363.*

**CDIS 364. Seminar in Audiology**  
 May be repeated for credit with a change in content.  
*1 - 6 credits, Seminar. Formerly COMS 364.*

**CDIS 365. Seminar in Speech Science**  
 May be repeated with a change in content.  
*1 - 6 credits, Seminar. Formerly COMS 365.*

**CDIS 366. Seminar in Hearing Science**  
 May be repeated for credit with a change in content.  
*1 - 6 credits, Seminar. Formerly COMS 366.*

**CDIS 367. Topics in Hearing and Speech Science**  
 May be repeated for credit with a change in content.  
*1 - 3 credits, Lecture. Formerly COMS 367.*

**CDIS 368. Topics in Speech Pathology**  
 May be repeated for credit with a change in content.  
*1 - 3 credits, Lecture.*

**CDIS 369. Topics in Audiology**  
 May be repeated for credit with a change in content.  
*1 - 3 credits, Lecture. Formerly COMS 369.*

**CDIS 370. Seminar in Psycholinguistics**  
 Reports and discussion of current research on a selected topic each semester. May be repeated for credit with a change in content,  
*3 credits, Seminar. Formerly COMS 370.*

**CDIS 372. Central Auditory Disorders**  
 Assessment of auditory processing in adults and children. Effects of processing problems on communication and a discussion of management techniques. Electrophysiological measurement techniques are stressed.  
*3 credits, Seminar. Formerly COMS 372.*

**CDIS 373. Pediatric Audiology**  
 Physiological and perceptual maturation of the auditory system from gestation through two years of age. Assessment of children's hearing, including difficult to test children, public school and neonatal screening.  
*3 credits, Lecture. Formerly COMS 373.*

**All Sections**

†**GRAD 395. Master's Thesis Research**  
*1 - 9 credits.*

†**GRAD 396. Full-Time Master's Research**  
*3 credits.*

†**GRAD 397. Full-Time Directed Studies (Master's Level)**  
*3 credits.*

**GRAD 398. Special Readings (Master's)**  
*Non-credit.*

**GRAD 399. Thesis Preparation**  
*Non-credit.*

†**GRAD 495. Doctoral Dissertation Research**  
*1 - 9 credits.*

†**GRAD 496. Full-Time Doctoral Research**  
*3 credits.*

†**GRAD 497. Full-Time Directed Studies (Doctoral Level)**  
*3 credits.*

**GRAD 498. Special Readings (Doctoral)**  
*Non-credit.*

**GRAD 499. Dissertation Preparation**  
*Non-credit.*

**COMPARATIVE LITERARY  
 AND  
 CULTURAL STUDIES**

The Program in Comparative Literary and Cultural Studies offers work leading to the M.A. and Ph.D. degrees, encouraging intercultural and interdisciplinary approaches to the study of literature and culture. Students are prepared in such areas as literary theory, discourse analysis, the history and methods of literary and cultural criticism, and in the comparative study of literary texts in relation to other cultural productions. The program's curriculum reflects changing relations among the literatures and cultures of Europe, the Middle East, Africa, Asia, the Americas and other regions of the world.

The Master's degree student chooses one literature other than English for major emphasis and a second for minor emphasis; the Ph.D. candidate chooses in addition a third literature or related area of study such as music or philosophy.

**Admission to Degree Programs.** A prospective student should be able to do graduate study in at least two different fields when applying for admission to the master's program and in three fields when applying to the doctoral program. An undergraduate major in one of these fields is not required. In special cases students may be required to make up lacunae in their background by taking additional courses. Also, the student's committee may require changes in the student's program in view of his or her particular needs.

**The M.A. Program.** The M.A. ordinarily requires a minimum of 24 credits of course work beyond the baccalaureate, including a course in literary theory and methodology; a course in at least one non-Western literature and culture; and a course from at least two of the following periods - ancient, medieval/Renaissance, modern. The course work must include studies in at least two genres. Proficiency is required in three languages, one of them English. Students are responsible for two periods in one literature and for one period in another. Students must successfully complete the M.A. qualifying exams, or, with the approval of the committee, have the option to prepare a Masters' project, a 50-page comparative work on a topic not previously submitted for a course and applying a critical apparatus.

**The Ph.D. Program.** The Ph.D. ordinarily requires 24 credits beyond the satisfaction of the requirements for the master's degree listed above, drawn from courses in theory and criticism, studies in at least two courses in literature and cultures drawing on non-western traditions, work in more than one discipline (e.g., anthropology, architecture, history, film, and sociology); a course involving the period before 1700 A.D.; proficiency in three languages, one of them English, and a reading knowledge of an ancient language; Ph.D. qualifying exams, written and oral; a Ph.D. dissertation that reflects appropriate use of bibliographic materials in foreign languages, the application of a criti-

cal apparatus upon a genuinely comparative topic, successful teacher training and practice supervised by members of the committee in a workshop series.

All students are expected to develop proficiency in a national language and literature to increase their options when entering the professional job market.

Language Requirements. These may be satisfied either by scoring a B or above in a 200-level literature or culture course in the target language or by obtaining a respectable score on a proficiency examination. The reading exams require translations of materials chosen by the faculty, to be completed before the final semester of studies.

**Foreign Study.** The program offers the possibility of studying in a variety of foreign countries for graduate credit. Universities now open to our students are located in Canada, Europe, Latin America, North Africa and Sub-Saharan Africa.

Information about the program and admissions may be obtained by writing to the Chairperson of the Program (Associate Professor Lucy McNeece).

Advisors from the fields of study participating include:

*English* – Professors Benson, Higonet, Hogan, R. Miller, Peterson; Associate Professors Coundouriotos and Phillips; and Assistant Professor Sánchez

*Classics* – Assistant Professors Travis and Johnson

*French* – Professor Berthelot; Associate Professors Célestin and McNeece

*Italian* – Professor Masciandaro and Assistant Professor Bouchard

*Spanish* – Professors Herzberger and Orringer; Associate Professor Gomes; and Assistant Professor Pardo

## COURSES OF STUDY

### CLCS 300. Introduction to Comparative Literature

Survey of comparative approaches to literary criticism; genre, period style, theory, literature in relation to the arts and social sciences.  
*3 credits, Lecture.*

### CLCS 301. Variable Topics

Possible topics include literature and the other arts, the sociology of literature, literature and psychology, and themes.  
*3 credits, Lecture Instructor Consent required.*

### CLCS 302. Critical Theory

Modern literary theories and critical approaches, such as structuralism, semiotics, archetypal, or Marxist criticism.  
*3 credits, Seminar. Instructor consent required.*

### CLCS 303. Comparative Studies in the Novel

The novel as a modern literary form, its relation to society, its epistemological strategies; European and American texts, including detective fiction.  
*3 credits, Lecture.*

### CLCS 304. Studies in Literary History

Periods, movements, and literary relations involving several national literatures. Possible topics include the Baroque, the Enlightenment, Symbolism, and the Avant-Garde.  
*3 credits, Seminar. Instructor consent required.*

### CLCS 305. Comparative Studies in Romanticism

West European Romanticism, the Bildungsroman, the quest, stories of the fantastic, and the greater Romantic lyric. Includes works of Goethe, Coleridge, Poe, Hugo and Leopardi.  
*3 credits, Lecture.*

### CLCS 306. Studies in Form and Genre

Aspects of epic, drama, poetry, or narrative, such as the classical epic, the historical drama, the pastoral poem, or the picaresque novel.  
*3 credits, Seminar.*

### CLCS 307. Literature and Science

The impact of science on literary imagination and style.  
*3 credits, Lecture.*

### CLCS 308. Marxist Literary Criticism

Introduction and survey of Marxist texts from Marx and Engels to Gramsci, Lukacs, Frankfurt School theoreticians, and contemporary theorists, feminists, and third-world practitioners.  
*3 credits, Lecture.*

### CLCS 310. Psychoanalysis and Literature

Introduction to the literary and cultural application of psychoanalytic theory to the reading of literary texts; psychoanalytic interpretation from Freud to Lacan and feminist Lacanians.  
*3 credits, Lecture.*

### CLCS 311. Introduction to Semiotics

Historical development and fundamentals of semiotics. Classical and structural models. Varying emphasis on a particular theory and its development.  
*3 credits, Lecture. Instructor consent required.*

### CLCS 312. Third-World Narratives

The study of creative and critical writings from developing nations in Latin America, Africa, and Asia, including works of minorities in America.  
*3 credits, Seminar.*

### CLCS 313. Theory and Practice of Translation

*3 credits, Lecture.*

### CLCS 314. Studies in Film History

Film history from the Silent era to the present. The development of film theory and the evolution of cinematographic language. Esthetics and ideology.

*3 credits, Lecture.*

### CLCS 315. Third-World Cinema

The cinema of developing countries studied as art and as cultural document; its relation to political and social realities and to film produced in the industrialized world.  
*3 credits, Seminar.*

### CLCS 316. Literature and Linguistics

Literary texts studied in the light of modern linguistic theory.  
*3 credits, Lecture.*

### CLCS 317. Studies in Comparative Culture

The intersection of ideas concerning urbanization and modernism through the medium of literature, architecture, fine arts, and film.  
*3 credits, Seminar. Instructor consent required.*

### CLCS 318. Special Studies

*1 – 6 credits., Practicum.*

### †GRAD 395. Master's Thesis Research

*1 – 9 credits.*

### †GRAD 396. Full-Time Master's Research

*3 credits.*

### †GRAD 397. Full-Time Directed Studies (Master's Level)

*3 credits.*

### GRAD 398. Special Readings (Master's)

*Non-credit.*

### GRAD 399. Thesis Preparation

*Non-credit.*

### †GRAD 495. Doctoral Dissertation Research

*1 – 9 credits.*

### †GRAD 496. Full-Time Doctoral Research

*3 credits.*

### †GRAD 497. Full-Time Directed Studies (Doctoral Level)

*3 credits.*

### GRAD 498. Special Readings (Doctoral)

*Non-credit.*

### GRAD 499. Dissertation Preparation

*Non-credit.*

# COMPUTER SCIENCE AND ENGINEERING

*Department Head:* Professor Reda Ammar  
*Professors:* Barker, Cooper, Demurjian, Lipsky, Maryanski, Rajasekaran, Shin, and Ting  
*Associate Professors:* Greenshields, McCartney, Peters, Santos, and Shvartsman  
*Assistant Professors:* Cui, Gokhale, Goldin, Huang, Kiayias, Mandoiu, Michel, and Russell

Study leading to the Master of Science and Doctor of Philosophy degrees in Computer Science and Engineering is offered. This study can involve courses selected from the fields of computer science, engineering, mathematics, statistics and the natural sciences. Current research activities are in the areas of software engineering, reusability, databases, data mining, programming languages, artificial intelligence, decision support, robotics, security, cryptography, theory of computing, algorithms, distributed computing, quantum computing, computer networks, parallel computing, cluster computing, grid computing, performance modeling, queueing theory, bioinformatics, scientific computing, pattern recognition, image processing, computer graphics, computational geometry, and optimization.

**Admission to the M.S. Program.** Normally it is expected that an applicant has a B.S. in Computer Science, Computer Engineering or a closely related field. Students with a degree in another area, but with a strong background in mathematics through calculus, extensive experience with one or more computer languages, and course work involving digital network design, computer organization, and programming systems also will be considered for admission. Students with little or no previous experience in the computer area will not be considered until they have acquired an adequate background. The following courses or their equivalents normally are expected: (A) MATH 115, 116, 210 (calculus), MATH 211 (differential equations), MATH 227 (linear algebra), STAT 220 (statistical methods); (B) CSE 124 (computing), CSE 207 (digital systems organization), CSE 240 (microprocessor assembly language), CSE 243 (computer organization), CSE 230 (software engineering), CSE 237 (automata); (C) CSE 221 (probabilistic performance analysis), CSE 244 (compilers), CSE 228 (parallel systems), CSE 254 (mathematics of discrete systems), CSE 258 (operating systems), CSE 259 (algorithms).

Outstanding students who are missing some of this background may be admitted before all of it is acquired but the first 2 calculus courses and all of (B) MUST be completed before acceptance. Students admitted to the program without an undergraduate degree in the computer area normally must take a number of undergraduate courses as background before starting their graduate studies. Some of these courses may be available during the summer session. These additional

courses will lengthen the period of study necessary to earn the M.S. degree.

**Requirements of the Ph.D. Program.** Decision for acceptance to the Doctor of Philosophy program is made by the graduate admissions committee in consultation with an advisor selected (if feasible) by the applicant. Admitted students must also submit evidence of capacity for independent study in the form of a master's thesis or comparable achievement.

**Special Facilities.** *Graduate Computing Facilities* – The Computer Science & Engineering Department maintains several computing labs for graduate training and research. These include labs consisting of Sun Workstations running Unix and Pentium platforms running a mixture of Linux, Solaris for Intel, and Windows operating systems. The facilities are managed by the department and used for various research projects. This is in addition to 10 specialized research labs located in the Information Technology Engineering building, maintained by individual faculty members supporting different projects in the department.

*Additional Research Facilities* – The Taylor L. Booth Engineering Center for Advanced Technologies maintains a modern set of networked laboratory facilities available to Computer Science and Engineering faculty and graduate students conducting research. These include several high performance computing systems and servers including the BECAT GRID which consists of over 24 nodes supporting grid and cluster middleware architectures. In addition to the BECAT GRID, there are numerous computing workstations which are available for small-scale and prototype research projects using platforms that range from Solaris to Windows to Linux.

For specific information with regard to the Computer Science and Engineering Program, fellowships, assistantships, and part-time instructorships, students should write to:

Chair, Computer Science Graduate Admissions Committee

Department of Computer Science and Engineering, Unit 3155

Storrs, Connecticut 06269-3155

Information concerning assistantships in the University Computer Center should be addressed to the Executive Director.

## COURSES OF STUDY

### CSE 300. Special Topics in Computer Science and Engineering

Classroom courses in special topics as announced in advance for each semester.  
*3 credits, Lecture.*

### †CSE 311. Seminar

Presentation and discussion of advanced computer science problems.  
*1 credit, Seminar.*

### CSE 320. Independent Study in Computer Science and Engineering

Individual exploration of special topics as

arranged by the student with an instructor.  
*1 – 6 credits, Independent Study. Instructor consent required.*

### CSE 321. Software Performance Engineering

Study of performance engineering techniques for the development of software systems to meet performance objectives. Software performance principles, hierarchical performance modeling, and current research trends related to Software Performance Engineering. Methods for computer performance evaluation and analysis with emphasis on direct measurement and analytic modeling, including queuing networks, computation structure models, state charts, probabilistic languages, and Petri-nets. Case studies for the evaluation and analysis of software architecture and design alternatives.  
*3 credits, Lecture.*

### CSE 326. Probabilistic Methods in Digital Systems

Probabilistic methods used to describe random processes and queueing theory and their application to such areas as computer performance, scheduling algorithms, error correcting codes, and stochastic machines.  
*3 credits, Lecture.*

### CSE 327. Advanced Software Engineering

An in-depth study of methodologies for the specification, design, implementation, verification, testing, and documentation of large complex software systems. Special attention is given to the impact of programming language constructs on the quality of complex software.  
*3 credits, Lecture.*

### CSE 330. Advanced Computer Networks and Distributed Processing Systems

Introduction to the design and evaluation of distributed computer communication and processing systems. Case studies, development of suitable queuing and other models to describe and evaluate design problems such as capacity assignment, concentration and buffering, network topology design, routing, access techniques, and line control procedures.  
*3 credits, Lecture. This course and ECE 335 may not both be taken for credit.*

### CSE 331. Distributed Database Systems

Architecture of distributed database systems and their major design problems. Topics include efficient data distribution, distributed views, query processing and optimization, and distributed synchronization. Particular attention is paid to the issue of concurrency control and reliability for distributed transaction processing. Backend database processors and database servers for local area networks are also discussed.  
*3 credits, Lecture. Prerequisite: CSE 350.*

### CSE 332. Parallel Processing

Models of parallel computations, distributed



computing design/implementation (problems including structuring, partitioning, allocation and scheduling), data flow and pipelined vector processors, performance measures and performance analysis, parallel algorithms and applications.

*3 credits, Lecture. Prerequisite: CSE 221 and CSE 340.*

### **CSE 333. Distributed Component Systems**

This course examines the methodologies, techniques, and tools that can be utilized to design, construct, and prototype a distributed application using a combined object- and component-based approach. Topics that are covered include object-oriented modeling, reusable components, software architectures, security, software agents, interoperation techniques, and deployment strategies. The role of emerging technologies in support of these topics will also be considered.

*3 credits, Lecture.*

### **CSE 340. Computer Architecture**

This course provides an in-depth understanding of the inner workings of modern digital computer systems. Traditional topics on uniprocessor systems such as performance analysis, instruction set architecture, hardware/software pipelining, memory hierarchy design and input-output systems will be discussed. Modern features of parallel computer systems such as memory consistency models, cache coherence protocols, and latency reducing/hiding techniques will also be addressed. Some experimental and commercially available parallel systems will be presented as case studies.

*3 credits, Lecture.*

### **CSE 350. Advanced Database Topics**

Data models/languages including entity-relationship, functional, semantic, and object oriented. Database components including the different building blocks of a database system, concurrency, control, recovery, security, access methods, query optimization, and views. Database architectures including database machines, text-database systems, distributed database systems, multimedia systems, and performance metrics and methodologies. Database applications including CAD/CAM and CASE.

*3 credits, Lecture.*

### **CSE 351. Semantic Data Models**

Conceptual data models, semantic and object-oriented data base systems, formal representation methods for data and knowledge, models of active and passive information.

*3 credits, Lecture.*

### **CSE 352. Data Mining**

An introduction to data mining algorithms and their analysis. Application of and experimentation with data mining algorithms on real-world problems and domains, with a dual focus on

addressing the solution quality issue and the time efficiency issue.

*3 credits, Lecture.*

### **CSE 353. Information and Data Security**

Introduction to privacy, confidentiality, and organizational considerations in the development of security policies for protecting information and data stored, processed and transmitted in computer and communication systems from unauthorized disclosure and modification. In depth study of security enforcement methods and techniques applied to operating systems, database systems and computer networks including user identification and authentication techniques, data access controls, information flow controls, inference controls and cryptographic techniques.

*3 credits, Lecture.*

### **CSE 354. Introduction to Modern Cryptography**

This course covers the foundations of modern cryptography, emphasizing provably-secure cryptographic constructions. The course covers basic topics such as one-way functions, security amplification, and hard-core predicates. Elementary aspects of computational number theory are introduced to motivate current candidate one-way functions such as RSA functions and Rabin's functions. These tools are applied to develop secure encryption schemes, pseudo-random generators, and digital signature schemes.

*3 credits, Lecture.*

### **CSE 355. Computational Geometry**

Curve and surface definitions emphasizing the interplay between those mathematical properties and efficient graphical display. Topics may include Bezier curves and surfaces, nonuniform rational B-spline (NURBS) curves and surfaces, Coons patches, Gordon surfaces, superquadrics, shape preservation, continuity/smoothness, differentiability, twist estimation, the convex hull property, and the treatment of supporting algorithms. Experimental projects are required.

*3 credits, Lecture.*

### **CSE 356. Advanced Computer Graphics**

Computer graphics as a tool for effective human-machine communications. Graphical input and output devices and their relation to human perception. Software systems for image generation, display and manipulation. Languages for description of both static and moving pictures. Solutions to visible-surface and related problems. Computer animation. Models and methodologies for the design of interactive systems for various graphics-oriented applications. Experimental projects are required.

*3 credits, Lecture.*

### **CSE 357. Advanced Numerical Methods in Scientific Computation**

Development, application and implementation of numerically stable, efficient and reliable

algorithms for solving matrix equations that arise in modern systems engineering. Computation of matrix exponential, generalized inverse, matrix factorization, recursive least squares, eigenvalues and eigenvectors, Lyapunov and Riccati equations. Extensive digital computer usage for algorithm verification and test.

*3 credits, Lecture. Prerequisite: MATH 215Q or EE301, which may be taken concurrently.*

### **CSE 358. Advanced Operating Systems**

Topics in modern operating systems with the focus on distributed computing, communication, and concurrency. Selected topics from current research in the theory, design, implementation, and verification of operating systems

*3 credits, Lecture.*

### **CSE 361. Advanced Sequential and Parallel Algorithms**

Computational complexity measures. Survey of major techniques used to design an efficient algorithm. These include divide and conquer, greedy, dynamic programming, and branch and bound techniques. Randomized algorithms. General characteristics of parallel computation models. General structure of parallel algorithms. Development techniques of efficient parallel algorithms.

*3 credits, Lecture.*

### **CSE 365. Fundamentals of Automata**

A rigorous treatment of automata and formal language theory. Emphasis placed upon finite state automata, regular languages, context-free languages, push-down automata, and Turing machines.

*3 credits, Lecture.*

### **CSE 367. Computer Science and Engineering Research Laboratory**

Experimental investigation of current research topics in computer science. May be repeated for credit with a change in content.

*3 credits, Lecture.*

### **CSE 372. Image Processing**

A formal approach to continuous variable and discrete variable imaging. Continuous and discrete transforms. Image enhancement. Image analysis including multidimensional edge-primitive theories, shape analysis. Multispectral imaging and applications. Image modelling. Syntactical analysis, aspects of image database theories. The course involves exposure to multispectral and extraterrestrial imagery. A substantial programming project is assigned.

*3 credits, Lecture.*

### **CSE 382. Advanced Artificial Intelligence**

Design and implementation of intelligent systems. Topics covered will include automated reasoning, natural language, learning, agents, probabilistic reasoning, and robotics. The course will include a substantial design project, and advanced independent study of at least one of

the above topics. This course and CSE 282 may not both be taken for credit.  
3 credits, Lecture.

†GRAD 395. **Master's Thesis Research**  
1 - 9 credits.

†GRAD 396. **Full-Time Master's Research**  
3 credits.

†GRAD 397. **Full-Time Directed Studies (Master's Level)**  
3 credits.

GRAD 398. **Special Readings (Master's)**  
Non-credit.

GRAD 399. **Thesis Preparation**  
Non-credit.

**CSE 426. Linear Algebraic Queueing Theory**  
Brief survey of Markov Chains, and their application to simple queues, with some emphasis on their transient behavior. Matrix operators are then introduced to represent the behavior of non-exponential servers. This algebraic structure is applied to the steady-state and non steady-state behavior of both open and closed M/G/1 queues. Then G/M/1 queues are examined in detail. As time permits additional advanced topics will be covered. Applications to computer and telecommunications system performance modeling will be studied.  
3 credits, Lecture. Prerequisite: CSE 326.

**CSE 430. Research Topics in Computer Networks**  
Research and development in planning, analysis and design of an interconnected collection of autonomous computers. Technical and organizational issues of computer networks, including communication media, topology, architecture, structures, and protocols. Topics include efficient resource sharing; high reliability, integrity and security; installation flexibility and expandability; ease of access; application adaptability; interface standardization; and internetworking.  
3 credits, Lecture. Prerequisite: CSE 330.

**CSE 455. Computational Topology**  
Topology has traditionally generalized concepts of real analysis to metric spaces and set axioms. The new field of computational topology has great potential for encompassing abstractions to unify domain-specific techniques now used in computational geometry, geometric modeling, visualization, image processing, engineering analyses and molecular simulation. The course will include perspectives from traditional topology and show how these need to be modified for realistic use in modern computing environments. Topics and emphases will vary.  
3 credits, Lecture. Prerequisite: CSE 455.

**CSE 461. Fault-Tolerant Parallel Computing**  
Advanced topics in fault-tolerant parallel algorithms. Shared memory and message-passing models of computation. Models of failure. Formal treatment of complexity measures, such as time, space, communication, work, and speedup. Lower bounds for parallel fault-tolerant computation. Design and analysis of efficient fault-tolerant algorithms. Combining efficiency and fault-tolerance in parallel and distributed algorithms.  
3 credits, Lecture. Prerequisite: CSE 332 or CSE 361.

**CSE 483. Natural Language Processing**  
An artificial-intelligence approach to computational linguistics. Representation of meaning and knowledge in computer-usable form. Understanding and generation of natural-language sentences and text. Theories of inference and application of world knowledge. Organization of large knowledge-based text-processing systems for applications in summary and paraphrase, question-answering, machine translation, conversation and computer-aided instruction. "Real" text-processing systems are demonstrated, and a term project is required.  
3 credits, Lecture. Prerequisite: CSE 382.

†GRAD 495. **Doctoral Dissertation Research**  
1 - 9 credits.

†GRAD 496. **Full-Time Doctoral Research**  
3 credits.

†GRAD 497. **Full-Time Directed Studies (Doctoral Level)**  
3 credits.

GRAD 498. **Special Readings (Doctoral)**  
Non-credit.

GRAD 499. **Dissertation Preparation**  
Non-credit.

## DENTAL SCIENCE

*Program Director:* Associate Professor R. L. MacNeil  
*Professors:* Cone, E. Eisenberg, Frank, Freedman, Goldberg, Grasso, Hand, Kennedy, Lurie, Nanda, Nuki, Reisine, Rossomando, Safavi, Spangberg, J. Tanzer, M. Tanzer, Taylor, Trummel, and Upholt

*Associate Professors:* Agar, Barry, Beazoglou, D'Ambrosio, Dealy, Dean, Kreutzer, Meiers, Mina, Nichols, Pendrys, and Pilbeam  
*Assistant Professors:* Kazemi, Kuhlberg, Thibodeau, and Zhu

**Master of Dental Science Degree Program.** Students in residency and specialty training in the School of Dental Medicine may also pursue a Master of Dental Science degree in the Graduate School. This program offers an opportunity for study and research in dental science, the basic life sciences, and the allied health fields and leads to the degree of Master of Dental Science. It is designed to fill the gap between the Ph.D. program in Biomedical Science and the various residency and specialty training programs provided by the School of Dental Medicine. The principal objective is to provide instruction in dental science that will enhance the student's ability to instruct and undertake research in dental schools. Courses of study are flexible with major emphasis on the accomplishment of research. Possibilities for interdisciplinary research are enhanced by cooperative activities with several university departments. Students may combine their work in this program with advanced training in the Departments of Endodontics, Oral Diagnosis, Orthodontics, Pediatric Dentistry, Periodontics and Prosthodontics. Further information and an application may be obtained from the School of Dental Medicine, Office of Admissions, Room AG030, University of Connecticut Health Center, Farmington, Connecticut 06030-3905.

**Dual D.M.D./Ph.D. in Biomedical Science Degree Program.** *Program Director:* Professor A. Lurie. This program leads to the awarding of dual D.M.D. and Ph.D. degrees. It is designed for a small number of outstanding students who have clearly defined career goals of research and teaching in the general area of the biological and biomedical sciences and who have the motivation and ability to pursue a rigorous training program in this area. The program provides basic science and research training as well as the standard dental curriculum and is designed to produce individuals who are likely to make important contributions to the solution of problems of significance to the health sciences. The overall program is administered by the Committee on Graduate Programs of the Health Center. The student applies as a dual-degree applicant to the Dual D.M.D./Ph.D. Committee of the Office of Admissions of the School of Dental Medicine. The Dual D.M.D./Ph.D. Committee operating in conjunction with the admission committee of the School of Dental Medicine reviews the application and admits the student. The student normally completes both programs, including the dissertation in a period of approximately seven academic years, including summers.

**Ph.D. in Biomedical Science Degree Program.** This is a rigorous academic program designed for students who have chosen career paths in research and teaching. The degree may be pursued independently or in conjunction with residency/specialty training in the School of Dental Medicine. For further information, see Biomedical Sciences.

**Ph.D. Degree Program in Materials Science: Dental Materials.** Students with research interests in the field of dental materials may pursue a Ph.D. degree in Materials Science. Similar to other special interdisciplinary programs in Material Science, students study the broad areas of thermodynamics, kinetics, analysis and structure/property relations. The program also provides overviews of the structure of dental and oral tissues; the epidemiology, etiology and manifestations of dental diseases; and the treatment of dental diseases. These over views are obtained in the formal course work at the Health Center. A primary objective of the program is to help the student develop an understanding of the manner in which the prevention and clinical treatment of dental disease is integrated with the limitations of the materials employed. The dissertation may involve study of any materials-related problem, but normally addresses a particular dental material or material-oral tissue interaction. Applicants would typically have backgrounds in materials science, metallurgy, polymer science or a related field and specific career goals in dentistry. For further information, see Materials Science.

## COURSES OF STUDY

### DENT 414. Introduction to Biomaterials and Tissue Engineering

A broad introduction to the field of biomaterials and tissue engineering. Presents basic principles of biological, medical, and material science as applied to implantable medical devices, drug delivery systems and artificial organs.

*3 credits, Lecture.*

### DENT 415. Contemporary Topics in Oral Biology I

A combination lecture/seminar course which focuses on current investigation in the areas of dentomaxillofacial growth and development, oral microbiology and immunology, oromaxillofacial mineralized tissues, and salivary glands and saliva. Subject matter covered in this course and DENT 416 will rotate over a two to three year schedule.

*2 credits, Lecture.*

### DENT 416. Contemporary Topics in Oral Biology II

A combination-lecture/seminar course which focuses on current investigation in the areas of dentomaxillofacial growth and development, oral microbiology and immunology, oromaxillofacial mineralized tissues, and salivary glands and saliva. Subject matter covered in this course and DENT 415 will rotate over a two to three year

schedule.

*2 credits, Lecture. Instructor consent required.*

### DENT 430. Advanced Oral Histology

Histologic structures, their embryological origin and function. Structure of developing teeth, alveolar bone, temporo-mandibular joint, oral mucosa, gingiva and salivary glands. Lecture and laboratories.

*2 credits, Lecture. Instructor consent required.*

### DENT 431. Advanced Oral Pathology and Diagnosis

Seminars on current developments in oral disease processes, with an emphasis on the clinical. Student presentations and lectures covering principles of Oral Diagnosis.

*2 credits, Seminar. Instructor consent required.*

### DENT 432. Biomaterials for Dental Graduates

Literature review/seminar covering various subjects of current interest in dental materials. Some prior knowledge of dental materials or of materials science is assumed.

*2 credits, Lecture. Instructor consent required.*

### DENT 433. Connective Tissue Biology I

Contemporary knowledge of the macromolecules of mineralized and non-mineralized extracellular matrices, with reference to the oral cavity. How do the various extracellular matrices fulfill their biological roles? How do the macromolecular components of the matrices arise and how are they regenerated? How do the matrices contribute to tissue differentiation, pattern regulation and craniofacial development? How do physiologic and pathologic processes affect matrices? Lectures and seminars.

*2 credits, Lecture.*

### DENT 434. Functional Oral Anatomy

Anatomic structures and relationships of the head and neck emphasizing surgical anatomy for oral, periodontal and endodontic surgery. Lectures and dissections.

*2 credits, Lecture. Instructor consent required.*

### DENT 435. General Pathology

*2 credits, Lecture. Instructor consent required.*

### DENT 436. Oral Physiology

Head and neck anatomy and physiology. Neuroanatomy and neurophysiology underlying oral motor and sensory systems. Lectures, seminars and laboratory.

*2 credits, Lecture. Instructor consent required.*

### DENT 437. Principles of Oral Microbiology & Infections

Oral flora with emphasis on recent research developments. Ecology of the oral cavity, dental caries and periodontal disease, viral and yeast infections. Prior knowledge of microbiology and biochemistry assumed. Lectures and discussions, term paper required

*2 credits, Lecture. Instructor consent required.*

### DENT 439. Research Methods in Epidemiology and Behavioral Sciences

This course is intended to provide students with an applied understanding of behavioral science research methods, building off of concepts introduced in Biostatistics DENT 456. Featured topics include: theoretical and methodological issues in research design; data collection strategies, focusing on survey measurement and the design and evaluation of survey questions; population sampling; data entry and variable construction; strategies for analyzing quantitative data, focusing in particular on regression analysis with dichotomous outcomes; and issues in analyzing longitudinal data.

*1 credit, Lecture. Prerequisite: DENT456.*

### DENT 440. Principles and Techniques of Developmental Biology

Molecular, cellular and tissue mechanisms operating during normal and abnormal development. Illustrate current biochemical microdissections and tissue culture procedures as applied to developmental biology. Lectures and discussions.

*3 credits, Lecture. Instructor consent required.*

### DENT 441. Biomechanics in Dental Science

Physics and engineering principles applied to clinical and research problems in dentistry. Principles of statics and mechanics of materials. Engineering analysis of orthodontic appliances. Lectures, seminars, and demonstrations.

*4 credits, Lecture. Instructor consent required.*

### DENT 442. Biomechanics in Dental Science

History and critical review of orthodontic appliance systems. The relationship between treatment planning and therapy is explored. Detailed biomechanical analysis of appliance therapy. Lectures, seminars and demonstrations.

*1 credit, Lecture. Instructor consent required.*

*Prerequisite: DENT 441.*

### DENT 443. Biology of Tooth Movement

Hard and soft tissue responses to tooth movement caused by orthodontic appliances; theory of related bone resorption and apposition from a morphological and biochemical standpoint. Seminars.

*1 credit, Lecture. Instructor consent required.*

*Prerequisite: DENT 441.*

### DENT 446. Connective Tissue Biology II

Selected topics in developmental biology, cell biology, molecular biology, structural biology and genetics of connective tissue.

*2 credits, Lecture. Prerequisite: DENT 433.*

### DENT 448. Periodontal Pathobiology I

The first of a two-part course spanning the full year covering the structure and function of the periodontal tissues and the pathogenesis of diseases affecting these tissues. Special emphasis is placed on the role of oral bacteria and the host response to these bacteria in the



initiation and progression of inflammatory periodontal disease. Lectures and seminars. *3 credits, Lecture. Instructor consent required.*

**DENT 449. Periodontal Pathobiology II**

The second of a two-part course spanning the full year covering the epidemiology, natural history, diagnosis, prevention, treatment planning, and treatment of periodontal diseases. *3 credits, Lecture. Instructor consent required.*

**DENT 450. Epidemiologic Methods in Oral Disease Research: Skills in Assessing the Literature**

Provides both an epidemiologic knowledge base and a set of analytical reading skills that clinical dentists can use to enhance understanding of epidemiologic research articles and to weigh and judge research findings that pertain to clinical techniques. *2 credits, Lecture. Instructor consent required.*

**DENT 452. Oral Maxillofacial Diagnostic Imaging and Interpretation**

Seminar course examining interpretation of images produced by various techniques used in diagnosis of diseases involving the oral maxillofacial complex. *4 credits, Lecture. Instructor consent required.*

**DENT 453. Basic Radiation Sciences I: Radiation Physics and Molecular and Cellular Radiation Biology**

Lecture/seminar course examining the nature and production of radiations, their interactions with matter and their effects on molecular and cellular structure, function and proliferation. *2 credits, Lecture. Instructor consent required.*

**DENT 454. Basic Radiation Sciences II: Tissue, Organ and Organismic Radiation Biology**

Seminar course in which the effects of ionizing radiation on tissue and organ systems, whole organisms and genetic integrity as well as the induction of cancer, will be examined. *2 credits, Lecture. Instructor consent required.*

**DENT 455. Scientific Writing**

This course consists of three parts. The first reviews syntax and the elements of clear written expression. The second deals with the forms and functions of manuscripts, review articles, grant applications, and dissertations. The final component addresses rewriting, abstracting, and editing to improve clarity and conciseness. *2 credits, Lecture. Instructor consent required.*

**DENT 456. Biostatistics**

The course contains 13 units and covers research design, probability theory, descriptive statistics, and for most of the course, inferential statistics including z and t tests, chi-square, correlation, linear regression, analysis of variance, and some repeated measures. The goal

is to enable the student to accurately understand and explain the biological and biomedical literature. Take-home assignments and three examinations are required. *2 credits, Lecture.*

**DENT 460. Cariology and Periodontology**

Examines epidemiology, clinical manifestations, microbiology, immunology, morphology, chemistry, and societal consequences of these two most prevalent human infectious diseases. *3 credits, Lecture. Instructor consent required.*

**DENT 461. Oral Histology**

Lectures and slide laboratories examine the morphology, development and function of oral tissues. Areas included are salivary glands, tooth germs, dental enamel, dentin, dental pulp, alveolar bone, cementum, periodontal ligament, oral mucosa, the dentogingival junction and facial growth. *2 credits, Lecture. Instructor consent required.*

**DENT 462. Restorative Sciences**

This course teaches the biological concepts of basic cavity preparation in Operative Dentistry and Fixed Prosthodontics. The didactic portion covers the theoretical concepts of cavity preparation, principles of which are then applied during laboratory exercises on artificial teeth, simulating clinical conditions. *4 credits, Lecture. Instructor consent required.*

**DENT 495. Independent Study**

A reading course for those wishing to pursue special topics in dental science under faculty supervision. *1 - 6 credits, Independent Study. Instructor consent required.*

†**GRAD 395. Master's Thesis Research**  
*1 - 9 credits.*

†**GRAD 396. Full-Time Master's Research**  
*3 credits.*

†**GRAD 397. Full-Time Directed Studies (Master's Level)**  
*3 credits.*

**GRAD 398. Special Readings (Master's)**  
*Non-credit.*

**GRAD 399. Thesis Preparation**  
*Non-credit.*

## DRAMATIC ARTS

*Department Head:* Professor Gary English  
*Professors:* Crow, Franklin, Hill, McDonald, Molette, Sabatine, and Stern  
*Associate Professors:* McCaw, McDermott, Nardi, Roccoberon, and Saternow

The Department of Dramatic Arts offers two graduate degree programs: the Master of Arts and the Master of Fine Arts.

The **Master of Arts** degree generally is considered a preparatory program for an advanced degree at a level between baccalaureate study and a terminal degree in Dramatic Arts. Our department offers the Master of Arts degree in Production, an applied study program with two areas of emphasis: Puppetry and Costuming.

Pursuit of the MA in production (with either the Puppetry or the Costuming emphasis) requires fulfillment of the admission requirements of the Graduate School and three letters of recommendation. All applicants for the MA (which requires a minimum of 30 credits) should consult the Department concerning program availability, personal interview with the program director, and portfolio review. Further information may be obtained by contacting the Department of Dramatic Arts.

The **Master of Fine Arts** degree generally is considered a terminal degree for students preparing for professional careers in commercial, regional, and educational theatre. Areas of concentration include: Acting, Design (Lighting, Costume and Scenery), Puppetry, and Technical Direction. Admission to this program requires fulfillment of the admission requirements of the Graduate School. Three letters of recommendation are required. Practical experience may be accepted in lieu of some course work. A personal interview on campus is required for residents of New England, New York and New Jersey. An audition is required for Acting applicants, and a portfolio is required for Design and Puppetry. Interview, audition and portfolio requirements can be fulfilled by applicants to the University Resident Theatre Association (U/RTA) finals in New York City, Evanston, Illinois, and Irvine, California. The Department admits a new class of MFA students in Acting once every three years. Prospective applicants for the MFA in Acting must consult the Department concerning program availability prior to applying. The Master of Fine Arts is a three year process-oriented program requiring a minimum of 60 graduate credits. A final project to be determined by student and advisors is required in all areas. A production record-book is required in all areas. Further information may be obtained by contacting the Department of Dramatic Arts.

**Curricular Opportunities and Special Facilities.** Through practicums and independent studies, students in the Department may expand the area of training beyond that indicated by the list of course offerings. Supplemental course work may be taken in humanistic and scientific disciplines appropriate to the concentration. The production program of the Department affords ample

opportunity for students to supplement their work with practical experience in the many productions offered the public throughout the year. Opportunities for students in particular programs to act, direct, design and technically produce are available in various facilities. Opportunities also are offered for original creative work.

The Department has at its disposal a well-equipped theatre, the Harriet S. Jorgensen, which houses most of the major productions. It is air-conditioned and seats nearly 500. A studio theatre seating about 100 and a unique multi-space theatre, the Mobius, provide additional opportunities for experimentation. In addition, there are facilities for film and television production work.

## COURSES OF STUDY

### DRAM 301. Studies in Scene Design

1 – 3 credits, Lecture. Instructor consent required.

### DRAM 302. Advanced Scene Design I

Advanced work in the principles and techniques of scene design. Students applying for admission to this course must submit sketches that indicate ability to draw.

3 credits, Lecture. Instructor consent required.

### DRAM 303. Advanced Scene Design II

Detailed analysis of and practical experience in the solving of unusual problems in scene design. Students applying for admission to this course must have a thorough knowledge of technical theatre.

3 credits, Lecture. Instructor consent required.

### DRAM 304. Scene Painting

Scene painting in a variety of media and techniques. Traditional and experimental materials are explored.

1 – 3 credits, Laboratory. Instructor consent required.

### DRAM 305. Production Drafting

Emphasis on preparation of plans appropriate for scenic studio bidding procedures.

3 credits, Lecture. Instructor consent required.

### DRAM 306. Advanced Lighting Design I

Advanced work in the principles and techniques of lighting design and origins and traditions of equipment and style.

3 credits, Lecture. Instructor consent required.

### DRAM 307. Advanced Lighting Design II

Detailed analysis and practical experience in the solving of unusual and complex problems in lighting design.

3 credits, Lecture. Instructor consent required.

### DRAM 308. Studies in Lighting Design

3 credits, Lecture. Instructor consent required.

### DRAM 309. Technical Direction

A study of the planning, management and

execution of all technical aspects of production.  
3 credits, Lecture. Instructor consent required.

### DRAM 311. Studies in Technical Production

1 – 3 credits, Lecture. Instructor consent required.

### DRAM 312. Technical Analysis

Analysis of scenic structures and materials, including stress and vector analysis, static and dynamic loading of beams and battens, truss design, and time/cost studies.

3 credits, Lecture. Instructor consent required.

### DRAM 313. Advanced Costume Design I

Advanced work in the principles and techniques of costume design. Students applying for admission must submit sketches that indicate ability to draw.

3 credits, Lecture. Instructor consent required.

### DRAM 314. Advanced Costume Design II

Detailed analysis of unusual problems in costume design: Opera, Ballet, Musical Theatre.

3 credits, Lecture. Instructor consent required.

### DRAM 315. Studies in Costume Design

1 – 3 credits, Lecture. Instructor consent required.

### DRAM 316. Audio Production

Audio recording and playback techniques used in the preparation of theatrical sound scores.

3 credits, Lecture. Instructor consent required.

### DRAM 317. Sound Technology

Application of signal processing devices and signal modification for specialized audio effects for production.

3 credits, Lecture. Instructor consent required.

### DRAM 318. Electricity and Electronics for the Theatre

Study of current electrical technology and applications, including AC theory and codes.

3 credits, Lecture. Instructor consent required.

### DRAM 319. Theatre Producing and Management

The creative and business aspects of producing the play.

3 credits, Lecture. Instructor consent required.

### DRAM 320. Advanced Voice and Diction

An intensive program of vocal training on the graduate level. Recommended only for students with a concentration in acting.

3 credits, Lecture.

### DRAM 321. Computer Applications

Survey of current software available for application to production management and technical design and production.

3 credits, Lecture. Instructor consent required.

### DRAM 322. Studies in Theatre Design

Investigates the physical problems and codes involved in integrating theatre technology into

the architectural requirements of a performance facility.

3 credits, Lecture. Instructor consent required.

### DRAM 323. Properties Construction

Fabrication of unusual stage properties and study of the application of experimental materials.

3 credits, Lecture. Instructor consent required.

### DRAM 324. Advanced Rigging Techniques

Technology and materials used in conventional and specialized rigging systems.

3 credits, Lecture. Instructor consent required.

### DRAM 327. Shop Technology

Use of materials, equipment and processes required in special fabrication techniques.

3 credits, Lecture. Instructor consent required.

### DRAM 328. Stage Technology

Power sources and drive mechanisms for stage machinery including electro-mechanical, hydraulic and pneumatic systems.

3 credits, Lecture. Instructor consent required.

### DRAM 329. Technical Research and Writing

Application of writing techniques and research methods used in preparation of technical reports and project documentation.

3 credits, Lecture. Instructor consent required.

### DRAM 330. Introduction to Graduate Studies in Stage Design

Projects in scenery, lighting and costume design for first-year graduate students in stage design and puppetry. Reading and discussion of various 20th century works on design theory for the theatre.

1 – 3 credits, Laboratory. Instructor consent required.

### DRAM 331. Design Drawing

Studio course in figure drawing and perspective drawing as foundation for students in theatre costume, scenic, and lighting design and puppetry arts.

1 – 3 credits, Laboratory. Instructor consent required.

### DRAM 337. Advanced Movement for the Actor I

Intensive study of organic movement, physicalization of character and movement in a scene for the advanced actor.

3 credits, Laboratory. Instructor consent required.

### DRAM 338. Advanced Movement for the Actor II

Continuation of Dramatic Arts 337.

3 credits, Laboratory. Instructor consent required.

Prerequisite: DRAM 337.

### DRAM 345. Advanced Acting I

3 credits, Laboratory. Instructor consent required.

### DRAM 346. Advanced Acting II

3 credits, Laboratory. Prerequisite: DRAM 345.

**DRAM 349. Advanced Puppetry I**

Advanced work in the history and construction of marionettes.  
3 credits, Lecture.

**DRAM 350. Advanced Puppetry II**

Advanced work in the principles and techniques of marionette production.  
3 credits, Lecture. Prerequisite: DRAM 349.

**DRAM 351. Studies in Puppetry**

1 – 3 credits, Lecture. Instructor consent required.

**DRAM 352. Studies in Acting**

1 – 3 credits, Laboratory. Instructor consent required.

**DRAM 355. Studies in Television**

1 – 3 credits, Lecture. Instructor consent required.

**†DRAM 359. Practicum in Dramatic Arts**

Special projects in dramatic arts.  
1 – 3 credits, Practicum. Instructor consent required.

**DRAM 361. Directing I**

Advanced problems in styles of directing, and in the directing of original plays.  
3 credits, Lecture. Instructor consent required.

**DRAM 362. Directing II**

3 credits, Lecture. Prerequisite: DRAM 361.

**DRAM 363. Studies in Directing**

1 – 3 credits, Lecture. Instructor consent required.

**DRAM 376. Studies in Film Production**

1 – 6 credits, Lecture. Instructor consent required.

**DRAM 383. Dramatic Form and Structure: Tragedy and Related Forms**

Form, structure and conventions as influenced by historical and theatrical conditions governing production.  
3 credits, Lecture.

**DRAM 384. Dramatic Form and Structure: Comedy and Related Forms**

Form, structure and conventions as influenced by historical and theatrical conditions governing production.  
3 credits, Lecture. Instructor consent required.

**DRAM 389. Field Studies Internship in Design/ Technical Theatre**

Supervised practical experience in professional/ regional theatres or academic institutions.  
1 – 6 credits, Independent Study. Instructor consent required.

**DRAM 390. Internship in Dramatic Arts**

Internships in acting, costuming, lighting, management, media, puppetry, pedagogy and

technical theatre.

0 credits, Practicum. Instructor consent required.  
Open only to Dramatic Arts graduate students holding a dramatic arts graduate assistantship.

**DRAM 391. Performance Techniques**

Performance study and practice in selected areas of dramatic arts.

1 – 3 credits, Lecture. Instructor consent required.

**DRAM 392. Independent Study**

1 – 6 credits, Independent Study. Instructor consent required.

**DRAM 393. Studies in Theatre History**

1 – 3 credits, Lecture. Instructor consent required.

**DRAM 395. Seminar**

Studies in selected areas of theatre arts. Topics may include but are not limited to such fields as aesthetics, criticism, theory and history.  
1 – 3 credits, Seminar. Instructor consent required.

**DRAM 396. M.F.A. Project**

**In design/technical theatre** - the design of sets, costumes and/or lights or technical direction for a production in the Department of Dramatic Arts. This project may consist of a portfolio presentation instead of an actual production. **In puppetry** - the design and direction of a puppetry production in the Department of Dramatic Arts. **In acting** - the preparation and performance of a substantial and challenging role from dramatic literature. **In directing** - the direction of a production in the Department of Dramatic Arts. Open only to M.F.A. candidates.  
1 – 6 credits, Independent Study. Instructor consent required.

**DRAM 397. Investigation of Special Topics**

A reading course under the direction of an appropriate staff member.  
1 – 6 credits, Independent Study.

**†GRAD 395. Master's Thesis Research**

1 - 9 credits.

**†GRAD 396. Full-Time Master's Research**

3 credits.

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

3 credits.

**GRAD 398. Special Readings (Master's)**

Non-credit.

**GRAD 399. Thesis Preparation**

Non-credit.

## ECONOMICS

*Department Head:* Professor Kathleen Segerson  
*Professors:* Allen, Carstensen, Hallwood, Heffley, Knoblauch, Langlois, Miceli, Ray, and Sacks  
*Associate Professors:* Ahking, Alpert, Cosgel, Couch, Cunningham, Harmon, Kimenyi, Landau, Lott, Minkler, Randolph, Ross, and Sazama  
*Assistant Professor:* Morand

Study leading to the Master of Arts and Doctor of Philosophy degrees is offered.

**Requirements for the Master of Arts Degree.** The program of studies for the M.A. degree is not uniform for all students. The combination of courses depends on the candidate's objective. For some purposes, a broad spread of subject-matter courses may be advisable, while for other purposes a narrowly focused program may be appropriate. Economics 308, 309, 310 are required. Candidates with inadequate backgrounds in mathematics are required to take Economics 214Q.

**Requirements for the Doctor of Philosophy Degree.** Students in the Ph.D. program are required to pass Economics 411, 412, 414, 418, 419, 420, 428, 429 or their equivalents. Undergraduate courses will not normally be considered as equivalents.

If a supporting area of study is elected rather than a foreign language, it cannot include any of the courses used to satisfy the above requirements; it must consist of a coherent unit of work in one subject considered a special skill for economists, and it must include at least one course above the 200's level.

Each student must pass the preliminary examination in economic theory before taking the field examination. Students choose from among the following: Industrial Organizations, International Economics, Macro/Money, and Public Economics. This field is then augmented with other course offerings.

**Special Facilities.** Computer time and assistance are available at the University Computer Center. Research opportunities may be available in connection with faculty projects or at the Connecticut Center for Economic Analysis. Some students publish scholarly articles in partnership with faculty.

### COURSES OF STUDY

**†ECON 300. Independent Study in Economics**

1 – 3 credits, Independent Study. Instructor consent required.

**ECON 301W. Topics in Economic History**

Focuses on critical episodes and salient turning points in the history of European, American, and Third World economic development; emphasis on institutional and technological factors. Evaluates different approaches.  
3 credits, Lecture. Instructor consent required.



**ECON 305. European Economic History**

The economic development of Europe from the Industrial Revolution to World War I. Emphasis on the economic and social factors that led to the industrialization of Europe.

*3 credits, Lecture.*

**ECON 306. American Economic History**

The growth and development of the American economy and the evolution of its economic institutions from the colonial period to the present. Assessment of agriculture, industry, transportation, commerce, finance, government, and population; and of their interaction with the physical environment, technology, public policy, and the world economy.

*3 credits, Lecture.*

**ECON 308. Microeconomics I**

Beginning graduate microeconomics covering consumer and producer theory, price determination, economic efficiency, and welfare analysis.

*3 credits, Seminar.*

**ECON 309. Macroeconomics I**

Survey of the field: its historical foundations and development, conceptual framework, and application to current macroeconomic problems.

*3 credits, Seminar.*

**ECON 310. Econometrics I**

Construction, estimation, and interpretation of economic behavioral and technical equations using data that are passively generated by a system of simultaneous, dynamic and stochastic relations.

*3 credits, Lecture.*

**ECON 314. Mathematical Economics**

Optimization, comparative statics, envelope theorem, basic differential and difference equations.

*3 credits, Lecture.*

**ECON 316. Topics in Microeconomics**

Topics in microeconomic theory, beyond the level of 329; students choose the material to be covered.

*3 credits, Lecture.*

**ECON 320W. History of Economic Thought to 1890**

Evolution of economic philosophy, doctrines, and techniques from the earliest analyses through the founding of neoclassical theory. Particular attention to the works of Smith, Ricardo, Malthus, Marx, and the early neoclassicals.

*3 credits, Lecture.*

**ECON 322W. History of Economic Thought from 1890**

The history and methodological underpinnings of modern economic theory. Topics include macroeconomics and business cycles; utility and demand theory; and industrial organization. Particular attention to Marshall and Keynes.

*3 credits Lecture.*

**ECON 324. Seminar in Mathematical Economics**

First half - calculus of variations and optimal control theory; second half - student presentations on journal articles and reports on students' own research.

*3 credits, Seminar. Prerequisite: ECON 314 and ECON 315.*

**ECON 330. Federal Finance**

Theories of government in the economy including general equilibrium, public choice and institutional economics. Government expenditures: budgeting, cost-benefit studies and analysis of specific expenditure programs. Taxation: equity and efficiency criteria for evaluating taxes, with application to major sources of revenue; public debt.

*3 credits, Seminar.*

**ECON 332. State and Local Finance**

Taxes and expenditures in a federal system, with particular emphasis on intergovernmental relationships. Rationale for federalism, problems of public choice, and tax incidence analysis.

*3 credits, Seminar.*

**ECON 334. Fiscal Policy**

Theory of government finance, with special emphasis on Federal expenditure and tax policies in pursuit of price stability and full employment. Emphasis on problems of collective choice, including the political business cycle and relations with the monetary authorities.

*3 credits, Lecture.*

**ECON 342. International Trade: Theory and Policy**

The economic aspects of international relations, including the pure theory of international trade and the instruments of commercial policy. Topics include comparative advantage; international economic policies; and regional economic integration.

*3 credits, Lecture.*

**ECON 343. International Finance: Theory and Policy**

Theoretical and historical analysis of international finance, including balance-of-payments adjustments, foreign-exchange markets, international capital flows, and the effectiveness of macroeconomic policies in open economies.

*3 credits, Seminar.*

**ECON 346. Monetary Theory and Policy**

Theoretical analysis of the role of money in the economy, including general equilibrium and monetarist frameworks, the demand for and supply of money, channels of monetary influence, and determinants of long-term and short-term interest rates. Problems of monetary policy, such as selection of instruments and targets, use of discretionary policy, and stability of the money multiplier.

*3 credits, Lecture.*

**ECON 347. Issues in Monetary Theory and Policy**

Contemporary theoretical and policy issues in money, such as portfolio theory, the money supply process, the mechanics of policy implementation, "crowding out," dynamic macro models, disequilibrium macro models, and rational expectations.

*3 credits, Lecture. Prerequisite: ECON 346.*

**ECON 348. Economic Development Policy**

The role of government in the economic development of underdeveloped countries. Topics include: alternative paradigms of development and the resulting place for government in the economy; the theory, institutions, and policies of government in planning, fiscal, and monetary concerns; analysis of policy instruments influencing international trade and financial flows; and the influence of international organizations on the development process.

*3 credits, Lecture.*

**ECON 350. Economic Development**

An examination of the problems facing the less developed nations. Comparisons of alternative paradigms of economic development (orthodox to political economy) and the strategies and policies they imply.

*3 credits, Lecture.*

**ECON 351. Economic Growth and Fluctuations**

Economic growth and business cycles in the economically advanced countries, with emphasis on both theory and evidence.

*3 credits, Lecture.*

**ECON 354. Environmental Economics**

Economic analysis of environmental problems and corrective policy instruments. Topics covered will include the theory of externalities and public goods, the role of uncertainty and imperfect information in policy design, benefit-cost analysis, and non-market valuation.

Applications to various environmental problems (such as air and water pollution, hazardous waste, and occupational health and safety) will be discussed.

*3 credits, Lecture. Prerequisite: ECON 308 or ARE 325.*

**ECON 355. Seminar in Development and Growth**

A continuation of Economics 350. Topics include agriculture and industry in development, investment criteria, essentials of developing planning, the promotion of domestic saving and fixed investment, foreign aid, improvements in international trade, and human capital formation.

*3 credits, Seminar.*

**ECON 359. Urban and Regional Economics**

Theoretical and empirical analysis of urban and regional systems in developed and developing economies. Special emphasis on the spatial characteristics and problems of metropolitan

markets for housing, transportation services, productive factors, and final products; land-use controls, housing subsidies, public transit, and other forms of public sector intervention.  
*3 credits, Lecture.*

**ECON 375. The Labor Market**

A thorough examination of the labor market. Topics include human capital, wage determination, public policy, and money wage rates.  
*3 credits, Lecture.*

**ECON 377. Collective Bargaining**

Examines the role of unions; unions and wages; public sector bargaining; bargaining models; and trends in union membership.  
*3 credits, Lecture.*

**ECON 381. Industrial Organization**

Survey of contemporary theory and models of the organization of industry. Topics include oligopoly; product differentiation; advertising; innovation; contestable markets; the financial theory of the firm; dynamic and evolutionary models; and transaction-cost economics.  
*3 credits, Lecture.*

**ECON 382. Topics in Public Policy toward Industry**

Theories of economic regulation. U.S. antitrust policy. Regulation of natural monopolies in theory and practice. Health and safety regulation.  
*3 credits, Lecture.*

**ECON 386. The Economics of Organization**

Surveys the modern agency, transaction-cost, and evolutionary theories of organization. Topics include measurement and monitoring costs, asset specificity, incomplete-contracts theory, the dynamic capabilities approach, and alternative organizations.  
*3 credits, Lecture.*

**ECON 392. Comparative Economic Systems**

Comparison of alternative economic systems, with emphasis on socialism in the former Soviet Union and Eastern Europe. Prices, planning, and enterprise management under socialism. Special attention to the system of market socialism in the former Yugoslavia.  
*3 credits, Lecture.*

**ECON 396. Applied Research Seminar**

A survey of research methods in economics and development of individual research projects.  
*3 credits, Seminar.*

**ECON 397. Topics in Economics**

*3 credits, Seminar. Instructor consent required.*

**†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

**†GRAD 396. Full-Time Master's Research**

*3 credits.*

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**ECON 411. Econometrics II**

Theoretical underpinnings of standard econometric methods of estimation and testing of single-equation models.  
*3 credits, Seminar. Prerequisite: STAT 315.*

**ECON 412. Econometrics III**

Special topics from single-equation models; simultaneous equations models; full information maximum likelihood methods; and recent advances in econometrics.  
*3 credits, Seminar. Prerequisite: Completion of ECON 411 with a grade of B- or better.*

**ECON 414. Advanced Mathematical Economics I**

The application of matrix algebra and differential and integral calculus to statics, comparative statics, and optimization problems in economics.  
*3 credits, Lecture.*

**ECON 415. Advanced Mathematical Economics II**

The application of integral calculus, differential equations, difference equations, and convex sets to economic dynamics, linear programming, and non-linear programming.  
*3 credits, Lecture. Prerequisite: Completion of ECON 414 with a grade of B- or better.*

**ECON 418. Microeconomics II**

Microeconomic theory: contemporary economic analysis of decisions by consumers, producers, and other agents.  
*3 credits, Lecture. Prerequisite: ECON 308 or ARE 325.*

**ECON 419. Macroeconomics II**

A rigorous course in macroeconomic modeling with policy applications. Focuses primarily on developments in the current literature, analytical techniques, and macroeconomic models. Includes an introduction to stochastic dynamic models.  
*3 credits, Lecture. Prerequisite: ECON 309.*

**ECON 420. History of Economic Thought**

Advanced treatment of material in 320W and 322W.  
*3 credits, Lecture.*

**ECON 428. Microeconomics III**

Markets, general equilibrium theory, efficiency, and advanced topics in microeconomics.  
*3 credits, Seminar. Prerequisite: Completion of ECON 418 with a grade of B- or better.*

**ECON 429. Macroeconomics III**

Stochastic modeling, recent developments in the literature, and policy applications. Topics may include real business cycle theory, new classical economics, neo-Keynesian theory and growth models.  
*3 credits, Seminar. Prerequisite: Completion of ECON 419 with a grade of B- or better.*

**ECON 435. Government Expenditures**

Theory and evidence of government expenditure policy.  
*3 credits, Lecture. Prerequisite: ECON 428.*

**ECON 436. Government Revenues**

Positive and normative analysis of alternative government resource uses.  
*3 credits, Lecture. Prerequisite: ECON 428.*

**ECON 442. Advanced International Trade: Theory and Policy**

Advanced treatment of material covered in ECON 342.  
*3 credits, Lecture. Prerequisite: ECON 428.*

**ECON 443. Advanced International Finance: Theory and Policy**

Advanced treatment of material covered in ECON 343.  
*3 credits, Lecture. Prerequisite: ECON 429.*

**ECON 446. Advanced Monetary Theory and Policy I**

Advanced treatment of material covered in ECON 346.  
*3 credits, Lecture. Prerequisite: ECON 429.*

**ECON 447. Advanced Monetary Theory and Policy II**

Advanced treatment of material covered in ECON 347.  
*3 credits, Lecture. Prerequisite: ECON 446.*

**ECON 481. Industrial Organization**

Advanced treatment of material covered in ECON 381.  
*3 credits, Lecture. Prerequisite: ECON 428.*

**ECON 486. Economics of Organization**

Advanced treatment of material covered in ECON 386.  
*3 credits, Lecture.*

**†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

**†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

## EDUCATION

*Dean:* Professor Richard L. Schwab

*Associate Dean:* Professor Thomas C. DeFranco

The Neag School of Education offers graduate programs which lead to the degrees of Master of Arts and Doctor of Philosophy. In addition, the School of Education confers the Sixth-Year Diploma in Professional Education. Graduate courses in education are offered in the following academic departments: Curriculum and Instruction; Educational Leadership; Educational Psychology; and Kinesiology.

Master's degree study is available in most secondary school teaching areas as well as in agricultural, elementary, music, and special education teaching areas. Courses of study also are available for school service personnel in areas such as evaluation and measurement, guidance and counseling, educational technology, reading, school psychology, special education, supervision and curriculum development, technical education, and vocational education.

Additionally, master's-level study is available in a variety of areas including adult learning, counseling, curriculum and instruction, educational administration, educational psychology, educational studies, educational technology, kinesiology, and higher education administration. For work leading to the master's degree in music education, also see course listings under the Department of Music.

A program leading to the Sixth-Year Diploma in Professional Education provides an opportunity for advanced students who have the master's degree to increase their professional competence through further study under the guidance of a faculty member. Inquiries and requests for admission to the Sixth-Year Program should be directed to the Office of the Dean, Neag School of Education, 249 Glenbrook Road, Unit 2064, Storrs, Connecticut 06269-2064.

The Ph.D. degree is offered in the following fields of study: adult learning, curriculum and instruction, educational administration, educational psychology, educational studies, educational technology (not accepting new students at this time), kinesiology, professional higher education administration (not accepting new students at this time), and special education.

**Admission Requirements for the Master of Arts Degree.** Applicants must have specific preparation for teaching adequate to meet the minimum professional requirements for obtaining a bachelor's degree through the Neag School of Education. College graduates with outstanding undergraduate records, but without such preparation, may apply for admission and if admitted, are expected to make up any deficiencies. Applicants wishing to specialize in elementary education must have completed an appropriate concentration of elementary education courses; applicants wishing to specialize in kinesiology should have an undergraduate major or the equivalent in kinesiology or in physical or recreation service education.

Applicants may be required to submit scores for the General Test of the Graduate Record Examinations and/or the Miller Analogies Test.

**Admission Requirements for the Ph.D. Degree.** The Doctor of Philosophy degree program is intended to give persons of unusual ability and promise the opportunity to become scholars in their areas of specialization. Only outstanding individuals whose experience and background will allow them to carry on a scholarly program and to work professionally at a level commensurate with the degree after its completion are accepted into the program.

Applicants to doctoral programs in education must submit scores for the Graduate Record Examinations General Test. In addition, applicants to some programs may be required to submit scores for the Miller Analogies Test. These tests must have been taken within the last five years. International students may have these test requirements waived by the Admissions Committee of a given program or deferred until after admission.

**Special Facilities in the Neag School of Education.** Several important services, facilities, and agencies contribute to the scholarship and research experiences of graduate students in education.

The Bureau of Educational Research and Services provides the opportunity for selected graduate students to gain experience in data processing, test analysis, and research procedures. There are opportunities in the Reading-Language Arts center for graduate students to pursue research studies of the many problems affecting the teachers of reading at all grade levels. The Northeast Center for Policy and Leadership is involved in the study of policy and leadership issues critical to the states in the Northeast. The Center on Postsecondary Education and Disability educates preprofessionals and professionals in acquiring knowledge and skills and developing state-of-the-art practices in disability services. The Department of Kinesiology has laboratory facilities available for research in these areas: sport biomechanics, exercise physiology, sport disabilities, sport social sciences, and the Center for Health Fitness. In addition, the local public schools of Connecticut cooperate closely with the University and provide opportunities for internships, practica, and field studies.

**Graduate Courses.** Education courses are listed under the sponsoring departments. Reference should be made to the offerings of the Departments of Curriculum and Instruction; Educational Leadership; Educational Psychology; and Kinesiology.



## CURRICULUM AND INSTRUCTION

*Department Head:* Professor Mary Anne Doyle

*Professors:* Baldwin, Goodkind, Irwin, Leu, and Reagan

*Associate Professors:* DeFranco and Lonning

*Assistant Professors:* Abbate, Glenn, Gort, Kaufman, McGivney-Burelle, Moss, Osborn, Reyes, and Rojas

Graduate programs in Curriculum and Instruction lead to degrees of Master of Arts in the field of education and Doctor of Philosophy. The Neag School of Education also confers a Sixth-Year Diploma in Professional Education. Master's and doctoral study is offered in bi-lingual and bi-cultural education, curriculum development, elementary education, and in most secondary school teaching fields. Students should consult the statement under Education for information pertaining to admission requirements and special facilities available in the Neag School of Education.

The Ph.D. in Educational Studies may be taken with a concentration in one of two areas: history and philosophy of education or social foundations of education (which include comparative and international education, and educational anthropology). Major advisors are T. A. Osborn, T. G. Reagan, X. A. Reyes, and P. S. Weibust.

## COURSES OF STUDY

### EDCI 300. Independent Study in Education

Students requesting this course should have a significant background in education and should present to the instructor problems, well-defined and well laid out for investigation, which hold special interest for them and which will be pursued on the plan of advanced study.

*1 – 3 credits, Independent Study. Instructor consent required.*

### EDCI 301. Lectures in Education

A course in which staff members and authorities in education and related fields discuss selected problems.

*1 credit, Lecture.*

### EDCI 302. Teaching in the Affective Domain

Study in the relationship between the affective and cognitive domains of education and how the affective domain influences student behavior in the learning process, self-awareness, and self-concept. Classroom activities, materials, and methods are featured.

*3 credits, Lecture.*

### EDCI 304. Foundations of Bilingual Education

Study of the political, social and legal aspects of bilingual education.

*3 credits, Lecture.*

### EDCI 305. Applied Learning Research for Instructional Leaders

A study of learning principles and their manifestations in classroom settings; design and application of goals and objectives; instructional methods and programming which complement and extend learning style preferences and collective and individual needs.

*3 credits, Lecture.*

### EDCI 306. Personal Growth for Teachers

This course is designed to assist classroom teachers in developing a better understanding of



self. It will provide techniques for coping with professional burnout, stress, conflicts, and depression, which can lead to revitalization, increased job satisfaction and better personal relationships among colleagues.  
*3 credits, Lecture.*

**EDCI 307. Curricular Issues in Bilingual Education**

Current approaches, methods and techniques with respect to curricular issues in contemporary bilingual education programs.  
*3 credits, Lecture.*

**EDCI 308. Teaching Writing in the Elementary School, Grades K-6**

A course for elementary teachers with emphasis on: teaching the writing process in persuasive, narrative and expository writing; evaluation of errors; developing appropriate curricular sequences; and research in the writing process.  
*3 credits, Lecture.*

**EDCI 309. Special Topics in Bilingual Education**

In-depth study of current topics related to bilingual education programs.  
*3 – 6 credits, Lecture.*

**EDCI 310. Curriculum Planning**

Examines teachers' issues and problems from real-life cases with theoretical perspectives and pedagogical methods.  
*3 credits, Lecture.*

**†EDCI 311. Workshop in Education**

Professional personnel to work cooperatively on problems arising out of actual school situations.  
*1 – 3 credits, Practicum.*

**EDCI 312. Bilingualism and Second Language Acquisition**

Developmental sequences and theories of first and second language acquisition.  
*3 credits, Lecture.*

**EDCI 313. Bilingual Education and Bilingual Reading**

Current methods, strategies and techniques of reading in the mother tongue (L1); transfer of reading skills into English (L2); and, evaluation and adaptation of L1 and L2 reading materials.  
*3 credits, Lecture.*

**EDCI 314. Elementary School Curriculum**

Analysis of the elementary school curriculum. Emphasis on curriculum development and educational alternatives.  
*3 credits, Lecture.*

**EDCI 315. Educational Linguistics**

Overview of the study of language and linguistics, and especially applied linguistics, with emphasis on their implications for classroom teacher.  
*3 credits, Lecture.*

**EDCI 317. Language Diversity and Literacy**

Overview of issues and debates concerning the theory and practice of literacy development for non-native English speaking students in the United States.  
*3 credits, Lecture.*

**EDCI 318. Methods for Teaching Foreign Languages in the Elementary Schools**

An introduction to methods of teaching foreign languages in the elementary schools. Includes FLEX, FLES, and immersion approaches.  
*3 credits, Lecture. Instructor consent required.*

**EDCI 319. Second Language Acquisition in the Elementary School-Age Student**

An introduction to current research related to second language acquisition in elementary school-age children, with emphasis on implications for foreign language instruction.  
*3 credits, Lecture. Instructor consent required.*

**EDCI 322. Language Ideology & Education**

Interrelationship among language, ideology, education and society, including examination of issues of social class, ethnicity, gender, social context, power, and politics. Also covered are literacy, language prescriptivism and standardization, language policy and discourse in critical perspective.  
*3 credits, Lecture.*

**EDCI 325. Introduction to Curriculum**

Philosophy, theory, and practice employed in curriculum development and change.  
*3 credits, Lecture.*

**EDCI 326. Curriculum Laboratory**

Open to teachers and administrators seeking practical solutions to curriculum problems in elementary and secondary schools. Reorganization of courses, reorientation of the program of studies, articulation of administrative units, and development of new materials are considered in relation to the local situation. Students make individual studies of their specific problems, and group studies of related problems.  
*1 – 6 credits, Practicum.*

**EDCI 327. Middle School Curriculum**

History, philosophy, and goals for middle school curriculum development, including intermediate and junior high schools.  
*3 credits, Lecture.*

**EDCI 328. Secondary School Curriculum**

History, philosophy, and goals for secondary school curriculum development. Functions, recent developments, and varying approaches.  
*3 credits, Lecture.*

**EDCI 329. Curriculum Development Processes**

A study of the processes, strategies, and techniques used to bring about planned curriculum development in any educational setting.  
*3 credits, Lecture.*

**EDCI 330. Curriculum Theory and Design**

Elements and formation of theory and application in the curriculum field.  
*3 credits, Lecture.*

**EDCI 331. Teaching the Elementary School Child**

Study of the development of the elementary school child, the relationship between theory and practice, balancing traditional expectations with current concerns, and the selection and implementation of successful learning experiences in both school and non-school settings.  
*3 credits, Lecture.*

**EDCI 334. Teacher Effectiveness Strategies**

Strategies to increase the effectiveness of the classroom teacher, including improving the teacher-student relationship, developing self-awareness and self-evaluation, the relationship between theory and practice, effective formal/informal instructional and evaluation techniques, using today's technology, and improving communication with administrators, parents, and the public.  
*3 credits, Lecture.*

**EDCI 335. Managing and Motivating Students in the Classroom**

Classroom management from the perspective of motivation theory. Whole group, as well as individualized, interventions for increasing students' task-attentiveness and academic interest.  
*3 credits, Lecture.*

**EDCI 336. History of Education in the United States**

Development of educational ideas and practices in the United States from the colonial period to the present.  
*3 credits, Lecture.*

**EDCI 339. History of Educational Thought**

Leading educational ideas and how these ideas influence theory and professional practice. The contributions of key individuals in the ancient, medieval and modern worlds are the basis for course organization.  
*3 credits, Lecture.*

**EDCI 341. Evaluation in Vocational and Technical Education**

Theories of evaluation; survey of practices and role of evaluation in educational programs; development of instruments and procedures for appraising educational programs and individual achievement.  
*3 credits, Lecture.*

**EDCI 342. Occupational Experience Programs**

Theory of occupational adjustment; design of experience programs; community cooperation; labor legislation, integration with school programs; and role of coordinator.  
*3 credits, Lecture.*

**EDCI 343. Introductory Reading Clinic**

Clinical practice in instruction of persons with corrective reading disabilities.  
*3 credits, Practicum.*

**EDCI 344. Career Education: Theory and Practice**

The need for and rationale of career education. Strategies and processes for implementing career education concepts and practices in schools and other educational settings.  
*3 credits, Lecture.*

**EDCI 345. Principles and Philosophy of Vocational and Technical Education**

Descriptive and normative principles of vocational and technical education with attention to their special, economic, psychological and political bases as a philosophical rationale.  
*3 credits, Lecture.*

**EDCI 346. Business Office Automation**

Business office automation. Word processing and related practices. Teaching techniques.  
*1 – 3 credits, Lecture.*

**EDCI 347. Program Planning and Curriculum Development in Vocational and Technical Education**

Analysis of vocational/technical program planning and curriculum development theory, with emphasis on principles and current issues influencing program decisions.  
*3 credits, Lecture.*

**EDCI 348. Experimentation in Music Education**

Application of experimental techniques to a problem of learning or pedagogy in music.  
*3 credits, Lecture.*

**EDCI 349. Administrative Applications in Vocational Education**

The application of administrative theories to programs of vocational education.  
*1 credit, Lecture.*

**EDCI 351. The Teaching and Learning of Mathematics in the Secondary School**

An examination of current approaches to the teaching and learning of mathematics in the secondary school. Emphasis will be placed on issues surrounding content knowledge, curriculum, pedagogy, epistemology, assessment, and technology with respect to recent national initiatives and instructional techniques impacting on the secondary school mathematics curriculum.  
*3 credits, Lecture.*

**EDCI 352. Curricula in Mathematics Education**

Exploration of significant curricula in mathematics education for teachers and supervisors of mathematics. Emphasis is placed on research and development related to content and techniques.  
*3 credits, Lecture.*

**EDCI 353. Instructional Strategies in Vocational and Adult and Human Resources Education**

Innovative approaches to the improvement of learning; instructional techniques, materials and media.  
*3 credits, Lecture.*

**EDCI 354. Teaching Science in the Middle and Secondary School**

Materials and advanced methods in the teaching of science in grades 7-12.  
*3 credits, Lecture.*

**EDCI 355. Research and Trends in Vocational and Technical Education**

The identification of issues and trends including analysis of selected studies in vocational and technical education.  
*3 credits, Lecture.*

**EDCI 356. Comparative and International Education**

Education and educational systems in comparative and international perspective, with emphasis on the interaction of educational institutions with other social, cultural and political institutions in society.  
*3 credits, Lecture.*

**EDCI 357. Multicultural Education**

Interrelationships between education and various sociocultural aspects of cultural diversity and cultural pluralism.  
*3 credits, Lecture.*

**EDCI 359. Philosophical Analysis in Education**

Introduction to philosophical analysis of significant educational concepts.  
*3 credits, Lecture.*

**EDCI 360. Latinos and U.S. Education**

Conditions of schooling for Latinos in the U.S. educational system via an historical and economic context. Policy issues and theoretical discussions of underachievement. Relationship between dominant and subordinate cultures and their effect on classroom discourses.  
*3 credits, Lecture.*

**EDCI 362. The Teaching of Reading**

An overview of process and program; theoretical models of the reading, guidelines for a total school reading program, definition of terminology and principles of instruction. Analysis of available material made when appropriate. Intended as a background course for teachers with no previous course work or experience in teaching reading.  
*3 credits, Lecture.*

**EDCI 363. The Teaching and Learning of Mathematics in the Elementary School**

This course will investigate the teaching and learning of mathematics in the elementary school. Emphasis will be placed on issues

surrounding content knowledge, curriculum, pedagogy, epistemology, assessment, and technology with respect to national initiatives and instructional techniques impacting elementary school mathematics.  
*3 credits, Lecture.*

**EDCI 364. Teaching Elementary and Middle School Social Studies**

A study of curriculum alternatives, techniques of individual and small-group instruction, evaluation and the development of teaching materials.  
*3 credits, Lecture.*

**EDCI 365. Qualitative Methods of Educational Research**

Purposes and nature of qualitative research, including selected techniques for conducting various types of qualitative and naturalistic research in educational settings.  
*3 credits, Lecture.*

**EDCI 366. The Teaching and Learning of Mathematics in the Middle School**

This course will investigate the teaching and learning of mathematics in the middle school. Emphasis will be placed on issues surrounding content knowledge, curriculum, pedagogy, epistemology, assessment, and technology with respect to national initiatives and instructional techniques impacting middle school mathematics.  
*3 credits, Lecture.*

**EDCI 367. Problems in the Teaching of Science**

Theories of teaching science with emphasis on studies of research related to current problems.  
*3 credits, Lecture.*

**EDCI 369. The Teaching and Learning of Mathematical Problem Solving**

This course will focus on the processes involved in mathematical thinking and mathematical problem solving. Classroom discussions will address those aspects associated with expert problem solving-domain knowledge, problem solving skills, metacognition (belief and issues of control), and aesthetic judgements. Students will have an opportunity to discuss and solve various types of mathematics problems and develop instructional strategies to teach and assess mathematical problem solving at the middle and secondary school levels.  
*3 credits, Lecture.*

**EDCI 370. Trends in Social Studies Curricula**

New curricula and developments. For teachers and supervisors of social studies.  
*3 credits, Lecture.*

**EDCI 371. Introduction to Critical Pedagogy**

Theory and practice in teaching for social justice with an emphasis on issues of class, race, gender and ethnicity.  
*3 credits, Lecture.*

**EDCI 372. Literacy in the Secondary School**  
Process and problems unique to literacy needs in the secondary school. Emphasis on differentiated instruction for students with diverse backgrounds and abilities.  
*3 credits, Lecture.*

**EDCI 373. Addressing Individual Needs and Talents in the Heterogeneous Classroom**  
Instructional and managerial techniques that can be used in the grade level classroom to meet the individual learning needs and talents of all students. Strategies for improving the effectiveness of large group, individual and small group instructional practices. Current and promising practices, as well as relevant research.  
*3 credits, Seminar.*

**EDCI 374. Materials and Methods in the Teaching of Elementary School Science**  
A systematic examination of major science and curriculum program for the elementary school, the selection and design of materials, the development of teaching techniques.  
*3 credits, Lecture.*

**EDCI 375. Media Literacy in an Information Age**  
A study of the growing field of media literacy and the media's influence upon our culture and education. Includes major principles, development of media analysis skills, and integration with the school curriculum.  
*3 credits, Lecture.*

**EDCI 377. Environmental Education**  
An exploration of state, national, and international environmental issues and instructional approaches for developing student awareness, knowledge, and concern for the environment, K-12. Includes classroom and field study.  
*3 credits, Lecture.*

**EDCI 379. Enhancing Classroom Curriculum with Computers and Electronic Media**  
Effective use of microcomputers and other electronic media to strengthen and enhance classroom instruction in the basic content and skill areas. Emphasis upon specific curriculum applications of technology rather than on its basic operation, mechanics, and programming.  
*3 credits, Laboratory.*

**EDCI 380. Writing for Educational Publications**  
Designing, writing, editing, and marketing material for professional publication.  
*3 credits, Lecture.*

**EDCI 381. Practicum**  
The implementation and application of theory in the student's area of specialization. Open primarily to master's and Sixth-Year students.  
*1 - 6 credits, Practicum.*

**EDCI 383. Introduction to Microcomputers in the Classroom**  
An introductory skills-centered approach to

using microcomputers in the classroom as the object and medium of instruction.  
*3 credits, Laboratory.*

**EDCI 384. Seminar**  
Analysis of the issues and research in the field of education. Open primarily to master's and Sixth-Year students.  
*1 - 3 credits, Seminar.*

**EDCI 386. Teaching Literature to Adolescents**  
A study of competing theories of literary response with an emphasis on implications for the teaching of literature and research on the teaching of literature. Includes some reading of literature for young adults.  
*3 credits, Lecture.*

**EDCI 387. Teaching Composition (7-12)**  
A study of composition theory, with an emphasis on implications for the teaching of writing and research on the teaching of writing.  
*3 credits, Lecture.*

**EDCI 388. TCPCG Seminar I: Student Teaching Seminar**  
Analysis of instructional practice in the clinical setting. Relationship of instruction to theory, and implications for instructional evaluation, are emphasized.  
*3 credits, Seminar. Department consent required. Open to students in the Teaching Certification Program for College Graduates, others with permission.*

**EDCI 389. TCPCG Seminar II: Teacher as Professional**  
Culminating seminar experience in the TCPCG program.  
*3 credits, Seminar. Department consent required. Open to students in the Teaching Certification Program for College Graduates, others with permission.*

**EDCI 390. Social and Multicultural Foundations of Education**  
An introduction to the social and multicultural foundations of contemporary public education in U.S. society. Includes discussion of the nature, organization and purposes of public education in a democratic society, cultural diversity in U.S. schools and society, the role of the classroom teacher, professional ethics, and contemporary issues in U.S. education.  
*3 credits, Lecture. Department consent required. Open to students in the Teaching Certification Program for College Graduates, others with permission.*

**EDCI 391. Learning Theories**  
Introduction to learning theories as they are applied to educational contexts. Topics include instructional objectives, behavioral analysis, social cognitive theory, cognitive psychology, social emotional development, and cognitive development.

*3 credits, Lecture. Department consent required. Open to students in the Teaching Certification Program for College Graduates, others with permission.*

**EDCI 392. Methods of Instruction and Evaluation**  
Selection and organization of learning experiences, instructional activities and materials, and methods of instruction. Course activities include a combination of lecture and seminar experiences.  
*3 credits, Lecture. Department consent required. Open to students in the Teaching Certification Program for College Graduates, others with permission.*

**EDCI 393. Meeting the Needs of Exceptional Learners**  
Introduction to the characteristics of and educational programming for students with exceptionalities.  
*3 credits, Lecture. Department consent required. Open to students in the Teaching Certification Program for College Graduates, others with permission.*

**EDCI 394. Reading and Literacy in the Content Areas**  
Effective use of reading and writing to help students learning content material. Includes selection of reading materials that are appropriate for individual students with diverse reading abilities, understanding reading diagnosis provided by other professionals, using reading material in ways that facilitate comprehension and learning, and using written assignments to increase understanding and recall.  
*3 credits, Lecture. Department consent required. Open to students in the Teaching Certification Program for College Graduates, others with permission.*

**EDCI 395. Subject Area Methods**  
Selection and organization of learning experiences, instructional activities and materials, and methods of instruction related to the subject area. Course activities include a combination of lecture and seminar experiences, as well as extensive practice teaching.  
*3 credits, Lecture. Department consent required. Open to students in the Teaching Certification Program for College Graduates, others with permission.*

**EDCI 396. TCPCG Directed Student Teaching**  
Supervised student teaching in a subject-specific content area.  
*9 credits, Clinical. Department consent required. Open to students in the Teaching Certification Program for College Graduates, others with permission.*

†GRAD 395. Master's Thesis Research  
*1 - 9 credits.*



†GRAD 396. **Full-Time Master's Research**  
3 credits.

†GRAD 397. **Full-Time Directed Studies (Master's Level)**  
3 credits.

GRAD 398. **Special Readings (Master's)**  
Non-credit.

GRAD 399. **Thesis Preparation**  
Non-credit.

**EDCI 400. Diagnostic and Prescriptive Teaching of Mathematics**

An introduction to the basic models and techniques for diagnosis of learning problems in mathematics, utilizing the case study approach.  
3 credits, *Lecture*.

**EDCI 401. Theoretical Foundations of Teaching English**

A sociocognitive perspective on teaching the English language arts, including the historical, sociological, linguistic, and psychological foundations of teaching English.  
3 credits, *Lecture*.

**EDCI 402. International Perspective on Bilingual Education**

Education of speakers of non-dominant languages in comparative and international perspective. Emphasis on issues of educational policy, curricula, teacher education, and evaluation as these relate to the schooling of cultural and linguistic minority populations in different societies.  
3 credits, *Lecture*.

**EDCI 404. Teaching English as a Second Language**

An examination of current research on the acquisition and learning of English as a second language (ESL) in school settings. Critical issues in the application of research on ESL to the bilingual classroom are discussed.  
3 credits, *Lecture*.

**EDCI 405. Mathematics Learning Clinic**

Diagnosis of learning problems of underachievers in mathematics. Planning and applying procedures to help them overcome learning problems.  
3 credits, *Lecture*.

**EDCI 409. Research in Bilingual Education**

Analysis of research in bilingual education, methods of research and design and implementation of research studies in bilingual education.  
3 credits, *Seminar*. Prerequisite: EDCI 307.

**EDCI 410. Seminar**

Cooperative study of developments and problems in the student's area of specialization.  
1 – 6 credits, *Seminar*.

**EDCI 413. Assessment of Bilingualism**

Principles of assessment for bilingual learners,

including language proficiency and dominance, (bi)literacy development, and academic content knowledge. Current assessment approaches for bilingual learners in different contexts (e.g., bilingual, ESL classes) and for various purposes (e.g., screening, placement, evaluation).  
3 credits, *Seminar*.

**EDCI 414. Advanced Issues in Bilingual Education**

Critical contemporary issues and topics related to bilingual education programs in the United States.  
3 credits, *Seminar*. Prerequisite: EDCI 307.

**EDCI 418. Research in Science Education**

An analysis of current research in science education. Emphasis on evaluation of research as well as the design and implementation of research.  
3 credits, *Lecture*.

**EDCI 421. Advanced Issues in Second Language Acquisition**

Advanced clinically-based seminar focusing on research issues and practice in second language acquisition.  
3 credits, *Seminar*.

**EDCI 422. Social and Political Context Bilingual Education**

Advanced seminar addressing the social and political context of contemporary bilingual education programs from a critical perspective.  
3 credits, *Seminar*. Prerequisite: EDCI 307.

**EDCI 423. Learning Theories for Mathematics Instruction**

This course will examine various learning theories and their influence on mathematics instruction. In particular, this course will be concerned with understanding the processes involved in mathematical thinking, the impact of learning theory on mathematics instruction, expert-novice models of mathematical behavior, and ways to enhance mathematics learning in the classroom.  
3 credits, *Lecture*. Prerequisite: EPSY 335.

**EDCI 424. Research in Mathematics Education**

Analysis of research in mathematics education, methods of research, and design and research studies.  
3 credits, *Lecture*.

**EDCI 425. Teaching Reading and Writing in Middle and Junior High School**

Process and problems unique to reading and writing needs in the middle and junior high school. Emphasis on the development of reading and writing strategies as well as diagnostic teaching methods appropriate to this level.  
3 credits, *Lecture*.

**EDCI 427. Teaching Reading in the Content Areas**

Emphasis upon the adaptation of materials,

reading skills and study strategies applicable to the content areas; functional techniques for incorporating reading into subject matter instruction; the role of reading personnel within school settings.  
3 credits, *Lecture*.

**EDCI 428. Supervision and Administration of the School Music Program**

Programming, scheduling, housing as they apply to music in the schools; of community demands, public relations and legal commitments; of types of supervisory and in-service organization.  
3 credits, *Lecture*.

**EDCI 429. Curriculum Construction in School Music**

Developing courses and music activities as resource units.  
3 credits, *Lecture*.

**EDCI 430. Seminar in International Education**

Concentrated study of culture and education in a major geographical region such as Africa, Asia, or Latin America; or cross-cultural studies of educational issues.  
3 credits, *Seminar*.

**EDCI 431. Sociocultural Theories for Educators**

The study of selected sociocultural theories and their application in education  
3 credits, *Seminar*.

**EDCI 432. Contemporary Educational Theories**

Examination of the work of selected major contemporary educational theorists, as well as of significant trends and developments in modern education.  
3 credits, *Seminar*.

**EDCI 435. Research in Multicultural Education**

Advanced study in the processes and findings of research in multicultural education.  
3 credits, *Lecture*.

**EDCI 436. Educational Ethnography**

Methodology and content of socio-cultural case studies dealing with education in a variety of cultural contexts.  
3 credits, *Seminar*.

**EDCI 437. Advanced Methods of Qualitative Research**

Field-based methods of collecting data in qualitative research studies in educational settings, coding and analysis of qualitative data, use of computer programs to analyze data, and methods and procedures for ensuring trustworthiness in qualitative research.  
3 credits, *Lecture*.

**EDCI 454. Teaching Children's Literature in the Elementary School**

Literature for elementary school children, techniques for developing interest in independent and recreational reading.  
3 credits, *Lecture*.

**EDCI 455. Research in Curriculum**

An intensive inquiry into the nature and types of research in curriculum development, and evaluation of research designs in curriculum. Primarily for doctoral candidates.  
3 credits, *Lecture*.

**EDCI 460. Practicum**

The implementation and application of theory in the student's area of specialization.  
1 – 6 credits, *Practicum*.

**EDCI 462. Teaching Reading and Writing in the Primary Grades**

Processing unique to beginning reading and writing with emphasis on emerging literacy and promoting literacy development.  
3 credits, *Lecture*.

**EDCI 463. Teaching the Language Arts**

Teaching integrated language arts including oral and written communication, creative language, and spelling development with an emphasis on current research.  
3 credits, *Lecture*.

**EDCI 465. Problems of School Music**

Analysis and evaluation of music curricula, procedures for presenting materials, and means of reaching objectives.  
3 credits, *Lecture*.

**EDCI 467. Problems in the Teaching of Mathematics**

Selection and use of current materials and basic concepts in modern mathematics, solutions to practical problems are considered.  
3 credits, *Lecture*.

**EDCI 470. Classroom Assessment and Correction of Reading Difficulties**

Types of reading difficulties and the remediation methods appropriate for use by the classroom teacher.  
3 credits, *Lecture*.

**EDCI 471. Clinical Diagnosis and Correction of Reading Difficulties**

Severe reading disabilities and clinical methods of remediation utilizing the case study approach.  
3 credits, *Lecture*.

**EDCI 476. Advanced Reading/Language Arts Clinic**

For prospective reading/language arts specialists. A laboratory course in planning and implementing remedial reading/language arts instruction for persons with severe or complex reading and writing disabilities.

6 credits, *Practicum*. *Instructor consent required*.  
*Prerequisite: EDCI 471*.

**EDCI 478. Design, Management, and Supervision of Reading Programs**

Designing, supervising and evaluating reading programs on a school and systemwide basis.

3 credits, *Lecture*. *Instructor consent required*.  
*Prerequisite: EDCI 471 and EDCI 476*.

**†GRAD 495. Doctoral Dissertation Research**

1 - 9 credits.

**†GRAD 496. Full-Time Doctoral Research**

3 credits.

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

3 credits.

**GRAD 498. Special Readings (Doctoral)**

*Non-credit*.

**GRAD 499. Dissertation Preparation**

*Non-credit*.

## EDUCATIONAL LEADERSHIP

*Department Head:* Professor Edward F. Iwanicki  
*President Emeritus, University Professor:* Hartley  
*Professors:* Case, Rallis, Schwab, and Sheckley  
*Associate Professors:* Johnson, Mullarney, and Streifer  
*Assistant Professor:* Bell and Kehrhahn

Graduate programs in the Department of Educational Leadership lead to degrees of Master of Arts in the field of Education, Doctor of Education, and Doctor of Philosophy. The Neag School of Education also confers a Sixth-Year Diploma in Professional Education. Students should consult the statement under Education for information pertaining to admission requirements and special facilities available in the School of Education.

The Sixth-Year Diploma Program in Educational Administration – University of Connecticut Administrator Preparation Program (UCAPP) is a special two year administrator certification program preparing people for school leadership positions. For additional information, contact the department office. This program is offered at the Storrs and Stamford locations.

The Ph.D. in Adult Learning program prepares professionals in adult learning and development and vocational education. Emphasis may be in leadership, program development, and research as it applies to professional roles in government, education, and industry. Major advisors are: A. A. Bell, M. T. Kehrhahn, A. J. Mannebach, P. B. Mullarney, and B. G. Sheckley.

The Ed.D. in Educational Leadership is offered. Additional information can be obtained from the Department Office.

The Ph.D. in Educational Administration is organized around knowledge of the broad field of educational administration and emphasis upon one or two management areas based upon the student's career objectives. Students are admitted usually once per year, depending on location. Classes are held in three locations — Hartford, Stamford, and Storrs. Students must have a Sixth-Year Diploma in Professional Education or its equivalent for

admission to this program. Major advisors are C. W. Case, H. J. Hartley, E. F. Iwanicki, P. E. Johnson, P. B. Mullarney, S. F. Rallis, R. L. Schwab, and P. A. Streifer.

The Ph.D. in Professional Higher Education Administration usually is taken with an emphasis in general administration or student affairs administration. Other emphases may be provided on the basis of the individual's career objectives. **New students are not being admitted at this time.**

## COURSES OF STUDY

**EDLR 300. Independent Study in Education**

Students requesting this course should have a significant background in education and should present to the instructor problems, well-defined and well laid out for investigation, which hold special interest for them and which will be pursued on the plan of advanced study.  
1 – 3 credits, *Independent Study*. *Instructor consent required*.

**EDLR 301. Lectures in Education**

A course in which staff members and authorities in education and related fields discuss selected problems.  
1 credit, *Lecture*.

**EDLR 304. Adult and Experiential Learning**

How experience enhances learning. Reflection. Problem solving. Analogical mapping. Deliberate practice. Development of expertise. Design of staff/professional development.  
3 credits, *Lecture*.

**EDLR 306. Workplace Learning**

Trends in workplace learning and workforce development. Conceptual models of performance improvement and transfer of training. Focus on individual, work team, and organizational variables related to learning, performance, and transfer of training.  
3 credits, *Lecture*.

**EDLR 309. Influences on Adult Learning**

Interaction of person and environment. Culture. Role of environment. Situational barriers. Motivation. Self-regulation. Personality. Gender. Life transitions. Self-directed learning.  
3 credits, *Lecture*. *Instructor consent required*.

**EDLR 310. Development of Programs for Adult and Human Resource Education**

Program development for adult learners; emphasis on collaborative planning, needs assessment, effective learning strategies, transfer of training, evaluation, principles of good practice.  
3 credits, *Lecture*. *Instructor consent required*.

**EDLR 311. Workshop in Education**

Professional personnel to work cooperatively on problems arising out of actual school situations.  
1 – 6 credits, *Lecture*.

**EDLR 315. Teacher Leadership and Organizations**

Teachers' role in providing leadership that extends beyond the walls of the individual classroom and includes collaboration with other adults.  
*3 credits, Lecture.*

**EDLR 321. Introduction to Student Services in Higher Education**

A survey of student services and personnel functions in higher education, including an examination of philosophies, goals, objectives and procedures.  
*3 credits, Lecture. Open to Students in Professional Higher Education Administration, others with permission.*

**EDLR 322. College Student Development: Programs and Services**

History and philosophy of student personnel work related to contemporary and projected student developmental programs and services. Rights, freedoms and responsibilities of students in relation to the college.  
*3 credits, Lecture.*

**EDLR 325. Issues in Student Affairs Administration**

An examination of issues which affect the new student affairs administrator. Topics vary per semester.  
*3 credits, Lecture. Open to Students in Professional Higher Education Administration, others with permission.*

**EDLR 326. Curriculum Laboratory**

Open to teachers and administrators seeking practical solutions to curriculum problems in elementary and secondary schools. Reorganization of courses, reorientation of the program of studies, articulation of administrative units, and development of new materials are considered in relation to the local situation. Students make individual studies of their specific problems, and group studies of related problems.  
*1 – 3 credits, Lecture.*

**EDLR 337. Professional Development**

Using research on how adults learn best and principles of human resource development to implement effective, job-imbedded professional development programs. Using professional development to advance organizational goals. Examination of best practices.  
*3 credits, Lecture.*

**EDLR 339. Women, Education and Social Change**

Examination of the lives of girls and women as students, teachers and academics. Emergence of teaching as a hierarchically sex-segregated profession. Effect of gender on the status and organization of the profession. Changing women's roles and social ideologies as related to women's educational aspirations, career

achievement and leadership.  
*3 credits, Seminar.*

**EDLR 340. Time Management and Personal Organization**

Principles and practices of time management. Including interdisciplinary studies relating time usage to organizational behavior and personal effectiveness.  
*3 credits, Lecture.*

**EDLR 349. Social Issues in Education**

Education as a distinctive social institution, emphasizing systemic theoretical perspectives and specific features of educational settings. Special attention to structural factors affecting equality of educational opportunity.  
*3 credits, Seminar.*

**EDLR 350. Budgeting and Resource Management**

Analysis of educational budget formats: program, capital, function, objective and zero based; budget planning, procedures, forms, documents, codes; political-economic issues in educational budgeting; case studies of program budgeting and site-based budgeting in education; cost reduction and analysis; resource management research.  
*3 credits, Lecture.*

**EDLR 355. Business Administration of Educational Organizations**

Business management of schools, including budgeting and accounting, office management, salaries and benefits, energy and plant operation, transportation, enrollment forecasts, investments, debt services, program audits, computer services, and fiscal-legal issues.  
*3 credits, Lecture.*

**EDLR 360. Leadership in Adult/Human Resources Education**

Assessing and understanding individual leadership style. Analyzing individual style within context of selected leadership theories. Relating leadership to organizational ambiguity and paradox.  
*2 credits, Lecture.*

**EDLR 361. Administrative Applications in Adult/Human Resources Education**

Administrative theory applied to adult and human resource education programs.  
*1 credit, Lecture.*

**EDLR 365. Program Evaluation for School Improvement**

Program evaluation issues critical to effective school leadership  
*3 credits, Lecture.*

**EDLR 370. Personnel Evaluation**

Issues critical to the design and implementation of effective personnel evaluation programs.  
*3 credits, Lecture.*

**EDLR 372. Improving Teacher Evaluation Practice**

Improving the teacher evaluation skills of principals and department heads through guided practice experiences that allow them to reflect on what they are doing now in light of promising alternatives.  
*3 credits, Lecture.*

**EDLR 375. Educational and Professional Needs of Women**

Research relevant to women in academic and corporate sectors related to mid-life transitions, sex-specific differentials, dual career and multiple role demands, leadership style, academic and corporate mentoring, and issues facing non-traditional and re-entry students.  
*3 credits, Lecture.*

**EDLR 376. Research Issues in Adult and Vocational Education**

Current research topics in adult and vocational education. Research designs and conceptual rationales for investigative studies.  
*3 credits, Seminar. Instructor consent required. Prerequisite: EPSY 309.*

**EDLR 377. Improving Adult Life-Skill Competencies**

Designed for professionals in the public, private and community sectors working with diversely prepared or culturally unique populations. Emphasis is upon the development of strategies and materials for assisting adults needing to improve literacy skills, functional competencies, and self-concept.  
*3 credits, Lecture.*

**EDLR 378. Contemporary Educational Policy Issues**

Study of current educational policy issues.  
*3 credits, Lecture.*

**EDLR 379. Community Education Principles and Programs**

Foundation and development of community education and community school and its programs.  
*3 credits, Lecture.*

**EDLR 380. Educational Planning**

An overview of the educational planning process and its relationship to the concepts of systems and futurism. Attention will be given to specific planning models and techniques such as needs assessment, PERT, PPBS, MBO, delphi, ZBB, and cost benefit analysis.  
*3 credits, Lecture.*

**EDLR 381. Practicum: Administrative Field Experience**

This course will provide an opportunity for educators who wish to become administrators of educational organizations to become familiar with the functions and tasks that certified administra-



tors perform. It is intended primarily for Sixth-Year students.

*1 – 6 credits Practicum. Instructor consent required.*

**EDLR 382. Administration of Educational Organizations**

Introduction to underlying constructs from the social and behavioral sciences that are basic to the administration of educational organizations. Emphasis will be placed on the nature and characteristics of organizations, interpersonal relationships, decision-making, authority, and leadership.

*3 credits, Lecture.*

**EDLR 384. Seminar**

Analysis of the issues and research in the field of education. Open primarily to Master's and Sixth-Year students.

*3 credits, Lecture.*

**EDLR 388. Planning Educational Facilities**

Analysis of the process for planning educational facilities both (1) in the planning necessary to develop a long-range plan for educational facilities for a community, and (2) the planning of a specific educational facility to include the development of educational specifications. Emphasis will be placed on projecting student enrollment and planning for facilities. Educational facilities will be visited.

*3 credits, Lecture.*

**EDLR 389. Effective Departmental Leadership**

Concepts and practices required of departmental leaders in today's secondary schools.

*3 credits, Lecture.*

**EDLR 390. Supervision of Educational Organizations**

Supervision models; teacher selection and introduction; teacher evaluation; staff development and organizational change.

*3 credits, Lecture.*

**EDLR 391. The School Principalship (K-12)**

Roles and functions of the principal, problem solving, decision-making, school culture, curriculum leadership.

*3 credits, Lecture.*

**EDLR 393. Administration in Multicultural Settings**

Emphasis is placed on helping individuals develop both a knowledge base (theories and concepts of multicultural education and their relation to educational administration) and a skills or action base (strategies, methods and techniques) for application in multicultural environments.

*3 credits, Lecture.*

**EDLR 396. Human Resources Administration**

Study of personnel management in education, including current laws, policies, practices and

problems such as recruitment, tenure, promotion, retirement; performance evaluation; motivation; salary, benefits, welfare; staff development; data collection; layoff procedures; grievances; contract administration.

*3 credits, Lecture.*

**EDLR 397. Legal Aspects of Education**

Legal status of public schools; legal rights and responsibilities of administrators, parents, students, school board members, and teachers.

*3 credits, Lecture.*

†**GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

†**GRAD 396. Full-Time Master's Research**

*3 credits.*

†**GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**EDLR 405. Issues in Teacher Assessment and Evaluation**

Critical review and analysis of current issues and emerging methodologies in teacher assessment and evaluation.

*3 credits, Lecture.*

**EDLR 406. Collective Bargaining in Education**

This course concerns resolving conflict through self-help, negotiations and arbitration, understanding the Teacher Negotiations Law and methods of dealing with impasses under the law. The course also deals with preparing for negotiations by teacher unions and boards of education.

*3 credits, Lecture.*

**EDLR 410. Seminar**

Cooperative study of developments and problems in the student's area of specialization.

*1 – 3 credits, Seminar.*

**EDLR 420. Data Driven Decision Making for School**

The purpose of this course is to provide school leaders with the knowledge necessary to improve instructional programs and make better policy by relying on data driven decisions and to provide school leaders with a working knowledge of data driven decision-making strategies and tools. The course meets in seminar/lab format with students working on data driven problems, analyses and developing access plans as a result. Students work on several case studies and a major project of personal, professional significance.

*3 credits, Seminar. Instructor consent required.*

**EDLR 421. Financial and Human Resources Management in Education I**

This course directs students to resources needed to provide essential personnel and financial management services in a school system. The course also develops leadership skills necessary to guide the establishment of learning communities within the school and the professional development of a school system's faculty and staff. The course is designed to stimulate participation in an analytic process of examining problems and issues that are grounded in the major conceptual, theoretical, and empirical literature on human resource development/human systems learning and financial and business management. It is especially concerned with people in school organizations and their learning.

*3 credits, Seminar. Instructor consent required.*

**EDLR 422. Inquiry and Research in Educational Leadership I: Foundations, Design, and Use**

Explicates knowledge production through systematic inquiry in education, including processes, questions, and strategies used to conduct meaningful research in schools. Explores the intersection of theory and practice with emphasis placed on the critical analysis and interpretation of the research literature to the practice of school leadership.

*3 credits, Seminar. Instructor consent required.*

*Open to students in the Ed.D. program in Educational Leadership.*

**EDLR 423. Inquiry and Research in Educational Leadership I: Implementation, Analysis, and Discovery**

A continuation of Understanding, Inquiry and Research in Educational Leadership I. Elaborates the strategies and tools used to conduct meaningful research in schools with emphasis in the actual conduct of research in school settings. Explores the link between research findings and the improvement of practice.

*3 credits, Seminar. Instructor consent required.*

*Open to students in the Ed.D. program in Educational Leadership.*

**EDLR 424. Leadership for Teaching and Learning: The Role of the Leader in School Improvement**

Explores leadership skills required to improve instruction and student learning in the school and district. Students develop and apply models to address an instruction/achievement issue in practice.

*3 credits, Seminar. Instructor consent required.*

**EDLR 425. Legal Issues in Human Resources Administration for School Leaders**

Provides legal bases for human resources decision-making through reading of primary source materials (statutes, administrative decisions, judicial decisions) and related materials, and related class discussion. Provides students with practical experience in analysis

and advocacy in human resource disputes, through mock negotiations, writing model briefs and conducting mock hearings.  
*3 credits, Seminar. Instructor consent required.*

**EDLR 428. Policies for Improvement: Mobilizing School and Community**

Advanced seminar explores perspectives on the policy environment for school improvement. Students identify policy issues, collect data, conduct analyses, and propose actions.  
*3 credits, Seminar. Instructor consent required.*

**EDLR 429. Legal Issues in Organizational Management**

The legal process and understanding of legal issues in education involving students, teachers, and boards of education.  
*3 credits, Seminar. Instructor consent required. Open to students in the Ed.D. program in Educational Leadership.*

**EDLR 430. Organizational Behavior in Educational Administration**

Advanced course focusing on interdisciplinary research about organizations, leadership behavior, and management processes.  
*3 credits, Lecture.*

**EDLR 431. Organizational Learning**

Group and collective learning in organizational settings, with an emphasis on adaptive and generative learning processes.  
*3 credits, Lecture.*

**EDLR 432. Psychological Foundations of Education**

Learning and related psychological theories and their implications for curriculum, teaching methods, and other aspects of educational practices.  
*3 credits, Lecture.*

**EDLR 440. The Student and the Law**

A study of the legal status of students in today's school with specific emphasis on pupil control, pupil welfare, and pupil attendance.  
*3 credits, Lecture.*

**EDLR 442. Research Designs in Adult and Vocational Education**

Controlling threats to internal and external validity in adult and vocational education research designs. Use of SAS to analyze research data.  
*3 credits, Lecture. Instructor consent required. Prerequisite: EDLR 376, EPSY 313, and EPSY 441.*

**EDLR 443. Research Seminar in Adult and Vocational Education**

Advanced research issues in adult learning.  
*1 credit, Seminar.*

**EDLR 445. Strategic Applications of Adult Learning**

Case study analysis and live case study

consultation to develop innovative approaches to adult learning to address the challenges of employee development in corporate, education, public sector, and private sector settings  
*3 credits, Seminar. Instructor consent required. Prerequisite: EDLR 304, EDLR 306, EDLR 309, and EDLR 431. Open to students in the Adult Learning graduate program.*

**EDLR 460. Practicum**

The implementation and application of theory in the student's area of specialization.  
*1 – 9 credits, Practicum. Instructor consent required.*

**EDLR 471. Seminar: School District Executive Leadership**

Seminar and practicum experiences focusing on leadership and policy issues facing school superintendents, central office administrators, and senior state education agency officials.  
*3 credits, Seminar.*

**EDLR 472. Seminar: Leadership and School Organizations**

Study of organizations and leadership from the perspective of the humanities and the social and behavioral sciences.  
*3 credits, Seminar.*

**EDLR 473. Economics of Education**

Education as an investment, efficiency, productivity, finance, consumer choice, race, gender, and related issues. All types and levels of education.  
*3 credits, Seminar.*

**EDLR 474. Educational Administration Issues and Research**

Designing educational research studies; current topics in school administration. This course ordinarily meets for ten full days for special research activities.  
*3 credits, Seminar. Prerequisite: EPSY 309, EPSY 313, and EPSY 441.*

**EDLR 476. Development of Educational Partnerships**

Forming Educational Partnerships; schools and families; early intervention programs; initiating contacts and fostering links with social service agencies, the juvenile justice system, the medical community, higher education institutions and business and industry; youth training and apprenticeships; restructuring schools to link services.  
*3 credits, Seminar.*

**EDLR 477. Educational Policy and Politics**

Study of educational policy; the politics of educational administration; and the processes of policy formulation, implementation and analysis. Specific educational policy areas are examined.  
*3 credits, Seminar.*

**EDLR 482. Computer Applications in Higher Education Administration**

Use of the computers in management, evaluation

and related college and university operations.  
*3 credits, Lecture.*

**EDLR 483. College Teaching**

Theory and practice of teaching and learning in colleges and universities. Research on college teaching. Models for assessment and evaluation.  
*3 credits, Lecture.*

**EDLR 485. The Law and Higher Education**

Constitutional and statutory provisions related to higher education. Legal rights and responsibilities of affected parties.  
*3 credits, Seminar. Open to Students in Professional Higher Education Administration, others with permission.*

**EDLR 486. Economics and Finance of Higher Education**

External and internal aspects of college and university funding. Models for effective management of funds.  
*3 credits, Seminar.*

**EDLR 488. Area and Regional Planning in Higher Education**

Planning models for area and regional development. Planning for institutional viability. Topics on planning and higher education demography.  
*3 credits, Lecture.*

**EDLR 489. Teacher Education**

An examination of programs and trends in teacher education including curriculum, student recruitment and selection. This course is intended for graduate students preparing for a career in teacher education or for administrative responsibilities in an institution of higher education which prepares teachers.  
*3 credits, Lecture.*

**EDLR 490. History and Philosophy of Higher Education**

Historical developments and philosophies of higher education. Special attention to higher education in America.  
*3 credits, Seminar.*

**EDLR 491. The College Student**

Characteristics of today's college students. Student behavior theory. Impact of college on students.  
*3 credits, Lecture.*

**EDLR 492. Administration of Student Affairs in Higher Education**

Administration of student affairs and services and applications of student development theory in the college community.  
*3 credits, Lecture. Open to Students in Professional Higher Education Administration, others with permission.*

**EDLR 493. Evaluation in Higher Education**

Nature, objectives, and basic procedures of evaluation as applied to various aspects of higher education.

3 credits, Lecture. Open to Students in Professional Higher Education Administration, others with permission.

**EDLR 494. Higher Education: Issues, Problems, and Trends**

Current issues, problems, and trends in higher education.

3 credits, Lecture.

**EDLR 495. Organization and Administration of Higher Education**

Applications of theories of higher education administration. Models of governance and planning. Models for management under various constraints.

3 credits, Lecture.

**EDLR 496. The Community College**

Sociological and economic changes affecting the community college movement; a survey of the problems in organization, administration, and curriculum.

3 credits, Lecture.

**EDLR 497. Seminar in Higher Education**

Study and discussion of selected topics in higher education.

3 credits, Seminar.

*Requisites: Open to Students in Professional Higher Education Administration, others with permission.*

†GRAD 495. Doctoral Dissertation Research

1 - 9 credits.

†GRAD 496. Full-Time Doctoral Research

3 credits.

†GRAD 497. Full-Time Directed Studies (Doctoral Level)

3 credits.

GRAD 498. Special Readings (Doctoral)

Non-credit.

GRAD 499. Dissertation Preparation

Non-credit.



## EDUCATIONAL PSYCHOLOGY

*Department Head:* Professor Sally M. Reis

*Professors:* Archambault, Brown, Karan, Kehle, Leu, McGuire, Reis, Renzulli, and S. Shaw

*Associate Professors:* Gubbins, Kulikowich, Norlander-Case, O'Connell, and Young

*Assistant Professors:* Bray, Chafouleas, Colbert, Madaus, McCoach, Puntambekar, Scott, and Siegle

Graduate study in the Department of Educational Psychology (<http://www.epsy.uconn.edu>) leads to the Master of Arts degree in the field of education, the Sixth-Year Diploma in Professional Education conferred by the Neag School of Education, and the

Doctor of Philosophy either in the field of study of Educational Psychology, Educational Technology, or Special Education.

**Ph.D. in Educational Psychology.** The Ph.D. in Educational Psychology may be taken with concentrations in the areas of Cognition/Instruction, Counseling Psychology, Gifted and Talented Education, and School Psychology. Students interested in evaluation and measurement should apply to Cognition/Instruction (evaluation and measurement is not admitting new students at this time).

**The Ph.D. in the area of Counseling Psychology** is intended to prepare counseling psychologists who work as professors, supervisors, researchers, and practitioners. The program of study follows the scientist-practitioner model and includes a balanced emphasis on counseling and psychological theories, research, assessment, and training in applied counseling skills. A graduate program leading to state certification as a school counselor also is available (see below). Supervised practicum and internship experiences within a wide variety of rural, urban, and suburban schools with students of all age levels are an integral part of the curriculum. Contact O. Karan at Unit 2064 for more information.

**The Ph.D. in the area of School Psychology** is accredited by both the American Psychological Association and the National Association of School Psychologists. The master's/sixth year program also is accredited by the National Association of School Psychologists. The program adheres to the scientist-practitioner model of graduate education which assumes that the effective practice of school psychology is based on knowledge gained from established methods of scientist inquiry. Emphasis is on the preparation of competent practitioners who are skilled and dedicated researchers who will contribute to the knowledge base in school psychology. In addition, the program is designed to acquaint students with the diversity of theories and practices of school psychology, allowing the student sufficient intellectual freedom to experiment with different delivery systems and various theoretical bases. The atmosphere is intended to foster student-faculty interaction, critical debate, and respect for theoretical diversity of practice, thus creating a more intense and exciting learning experience. The faculty believe that such an environment encourages and reinforces the student's creativity and intellectual risk that are fundamental in the further development of the professional practice of school psychology. Contact T.J. Kehle at Unit 2064 for more information.

**The Ph.D. in the area of Cognition/Instruction** bridges the gap between psychological theory and research and educational practice. There are three emphases in the program: instructional psychology, measurement and evaluation, and learning technology. Courses include situated learning, learning and cognition, cognitive development, instrument design, statistical methods, and sampling theory. Additionally, research experiences are provided both at the University as well as in more applied settings. Application should be submitted to the field of Educational Psychology with area of concentration Cognition/Instruction. Contact A. O'Connell at Unit 2064 for more information.

**The Ph.D. in the area of Gifted and Talented Education** prepares individuals for leadership roles as gifted education program coordinators, curriculum development specialists, regional or state gifted education agency directors, and for positions as teachers and researchers in higher education settings. The program of study includes course work on strategies and program models for developing student talent, field experiences in school settings, and research investigations that provide worthwhile and creative contributions to the literature. Contact E. J. Gubbins at Unit 3007 for more information.

**Ph.D. in Educational Technology.** The Ph.D. in Educational Technology emphasizes the study of the use of various media to promote learning and instruction. Special emphasis is placed on research, and development and design of instruction based on the latest instructional technologies. Students completing the program may work in academic or in training settings.

**Ph.D. in Special Education.** The Ph.D. in general Special Education is an individualized program, containing a number of emphases, including study in teacher education, transition, behavioral disorders, school reform, learning disabilities, early childhood, developmental disabilities and secondary, postsecondary/adult and vocational education, among others. Our commitment is to inspire and prepare professionals in special education to create and broaden opportunities for individuals with disabilities. Students are encouraged to develop their interests in educating learners at risk across a wide range of disabilities incorporating a lifespan perspective. The doctoral program is designed to enhance independent thinking and leadership qualities through an individualized program embedded in a thorough knowledge of theory and the existing literature and culminating in active research to guide, direct, and inform the field. Contact J. McGuire at Unit 2064 for more information.

## COURSES OF STUDY

**EPSY 300. Independent Study in Education**

Students requesting this course should have a significant background in education and should present to the instructor problems, well-defined and well laid out for investigation, which hold special interest for them and which will be pursued on the plane of advanced study.

1 - 3 credits, Independent Study. Instructor consent required.

**EPSY 301. Lectures in Education**

A course in which staff members and authorities in education and related fields discuss selected problems.

1 credit, Lecture.

†EPSY 302. Group Processes in Counseling

Experiential and theoretical introduction to group process and dynamics.

3 credits, Lecture.



**EPSY 303. HIV/AIDS Counseling**

Provides professional counselors and students of counseling with: (1) a current knowledge base concerning HIV and AIDS; (2) counseling theory related to terminal illness and death and dying; (3) educational, sociological, psychological, and counseling interventions related to the prevention and spread of HIV/AIDS; and (4) counseling intervention skills in working with infected individuals and the friends, partners, and children and family members of individuals who are HIV positive or who have AIDS. The course format consists of lectures, small group discussion/interaction, and in-class demonstrations/role-play.

*3 credits, Lecture.*

**EPSY 304. Group Dynamics**

Basic group dynamics from a cultural and gender perspective. Application to various group orientations and settings. Group experience is integral.

*3 credits, Lecture.*

**EPSY 305. Principles of Counseling in the Helping Professions**

Basic philosophical and professional premises of the counseling profession. History of counseling profession, counselor's roles and functions, role of research/theory in counseling, and professional ethics. Individual group, and preventive counseling approaches.

*3 credits, Lecture.*

**EPSY 306. Human Diversity: Individuals Who Are Exceptional in Contemporary Society**

The needs, functioning, and contributions of individuals defined as exceptional. The spectrum of services across the age span and contemporary issues in service delivery, are surveyed.

*3 credits, Lecture.*

**EPSY 307. Curriculum Issues in Special Education**

Program and curriculum planning for students with moderate to mild disabilities with particular attention given to relating individual education plans to school curricula.

*3 credits, Lecture.*

**EPSY 308. Instruction for Students with Special Needs in the Mainstream**

Focus on planning for and working with students with special needs in schools.

*3 credits, Lecture.*

**EPSY 309. Quantitative Methods in Research I**

Quantitative procedures and analysis of computer output including descriptive and inferential statistics through one-way analysis of variance.

*3 credits, Lecture.*

**EPSY 311. Workshop in Education**

Professional personnel to work cooperatively on problems arising out of actual school situations.

*1 – 3 credits, Lecture.*

**EPSY 312. Principles of Career Development in Counseling**

Career development and career psychology. Adolescents and adults.

*3 credits, Lecture.*

**EPSY 313. Quantitative Methods in Research II**

Quantitative procedures and analysis of computer output including factorial analysis of variance, analysis of covariance, and multiple regression.

*3 credits, Lecture.*

**EPSY 314. Pupil Behavior: Studies in Clinical Diagnosis**

Diagnosis of school problems, report writing for school purposes, and an analysis of needs for referral.

*3 credits, Lecture. Instructor consent required.*

**EPSY 315. Pupil Personnel Work**

Principles and practices of pupil personnel work in educational institutions including all aspects of pupil personnel services; the role of the school counselor as a pupil personnel worker; and as a consultant on teacher-pupil relations.

*3 credits, Lecture.*

**EPSY 316. Counseling: Theory and Practice**

Contemporary theories and practices of essential helping skills.

*3 credits, Lecture. Prerequisite: EPSY 315.*

**EPSY 317. Interactive Learning Environments**

This course is a broad overview of the interactive learning environments (ILEs) that are being used in Education. It will introduce students to current research in development and implementation of ILEs.

*3 credits, Lecture. Prerequisites: EPSY 343 and EPSY 335.*

**EPSY 318. Curriculum and Instruction for Students with Severe Disabilities**

Teacher competencies in curriculum design and implementation for students with severe disabilities.

*3 credits, Lecture.*

**EPSY 319. Program Design and Implementation for Individuals with Severe Disabilities**

Management competencies in the design and implementation of programs for individuals with severe disabilities.

*3 credits, Lecture.*

**EPSY 322. Working with Families Who Have Children with Special Needs**

Educational issues and strategies in understanding and working with families who have children with disabilities

*3 credits, Lecture.*

**EPSY 323. Intervention and Assessment Procedures for Infants and Toddlers Who Are At-Risk**

This course addresses the development of young

children who have disabilities or who are at-risk for disabilities.

*3 credits, Lecture.*

**EPSY 325. Gender Role Conflict Issues for Helping Professionals**

Intensive review of gender role socialization in a workshop setting, emphasizing men's and women's gender role conflicts across the life span. Lectures, readings, discussions, self assessments, and media are used to explicate core concepts and themes.

*3 credits, Lecture.*

**EPSY 326. Curriculum Laboratory**

Reorganization of courses, reorientation of the program of studies, articulation of administrative units, and development of new materials are considered in relation to the local situation.

Students make individual studies of their specific problems, and group studies of related problems.

*1 – 6 credits, Practicum.*

**EPSY 327. Clinical Experiences in Integrated Settings**

An intensive supervised clinical experience that provides opportunities for students to plan and deliver integrated programs for students with and without special needs. A cooperative venture between the School of Education and the Professional Development Centers (public schools).

*1 – 6 credits, Practicum.*

**EPSY 328. Community Integration of People with Disabilities**

Trends in the integration of children and adults with disabilities into their communities. An overview of services to persons with disabilities by public and private agencies.

*3 credits, Lecture.*

**EPSY 329. Vocational Planning for Students with Disabilities**

Career/vocational opportunities for students with disabilities, including school-to-work and adult-life transition planning.

*3 credits, Lecture.*

**EPSY 330. Issues in Postsecondary Disability Services**

An examination of issues relating to the assurance of equal educational access for students with disabilities in postsecondary settings.

*3 credits, Lecture.*

**EPSY 331. Developmental Foundations of Exceptionality**

An exploration of the link between normative theory and research in child development with assessment, understanding, and intervention for children and youth with exceptionalities.

*3 credits, Lecture.*

**EPSY 333. Instructional Strategies and Adaptations for Students with Special Learning Needs**

Principles and practices for the provision of effective instruction for students with special learning needs.  
*3 credits, Lecture.*

**EPSY 334. Individual Differences in Learners**

Foundations for individual differences among elementary and secondary school pupils.  
*3 credits, Lecture.*

**EPSY 335. Learning: Its Implication for Education**

Nature and types of learning, transfer of training, motivation, nature of instructional outcomes, with particular attention to individual differences among elementary and secondary school pupils.  
*3 credits, Lecture.*

**EPSY 336. Individual Pupil Assessment**

Diagnosis and prescription for children with special learning and behavioral disabilities, including administration, scoring and interpretation of pupil assessment instruments.  
*3 credits, Lecture.*

**EPSY 337. Preventing Drug and Alcohol Abuse in the Schools**

Identification and treatment of at-risk students for drug and alcohol abuse in the schools.  
*1 credit, Seminar.*

**EPSY 338. Intellectual Assessment**

Administration of the standard instruments of intellectual assessment and synthesis of the test information into an assessment report.  
*3 credits, Lecture. Instructor consent required. Prerequisite: EPSY 342, which may be taken concurrently, and enrollment in the School Psychology program.*

**EPSY 339. Assistive Technology for Curriculum Access**

This course will explore the range of assistive technology devices and software for curriculum access from the preschool through secondary environments.  
*3 credits, Lecture.*

**EPSY 341. Principles and Methods in Educational Research**

Methods of research in education designed for Master's level students.  
*3 credits, Lecture.*

**EPSY 342. Educational Tests and Measurements**

The development of measurement and evaluation techniques.  
*3 credits, Lecture.*

**EPSY 343. Introduction to Educational Technology**

Instructional applications of productivity software

and educational technology.  
*3 credits, Lecture.*

**EPSY 344. Construction of Evaluation Instruments**

The theory and construction of assessment instruments in the affective domain.  
*3 credits, Lecture.*

**EPSY 345. Computer Methods in Educational Research**

Introduction to the UConn mainframe and microcomputers, data preparation and verification, Job Control Language, XEdit procedures, and SPSS-X.  
*2 credits, Laboratory. Prerequisite: EPSY 309.*

**EPSY 346. Multivariate Analysis in Educational Research**

An extension of EPSY 313. Practical emphasis on multiple regression, canonical correlation, multivariate analysis of variance and covariance, discriminant function analysis, and factor analysis.  
*3 credits, Lecture. Instructor consent required.*

**EPSY 347. Methods of Inquiry**

Fundamentals of qualitative and quantitative research in education.  
*3 credits, Lecture.*

**EPSY 348. Suicide Prevention in the Schools**

Covers the incidence, extent, and treatment strategies for the prevention of suicide among young people in the schools.  
*1 credit, Seminar.*

**EPSY 349. Procedures for the Education of Individuals with Disordered Behavior**

Approaches for adapting programs to the behavioral, social and emotional needs of exceptional learners.  
*3 credits, Lecture.*

**EPSY 350. Considerations in the Provision of Assistive Technology**

Emphasis will be on the consideration of assistive technology in the educational environment and will encompass the scope of activities involved in considering whether assistive technology is needed for a student to receive a free and appropriate education. This course is a required prerequisite for all other course work in the assistive technology emphasis.  
*3 credits, Lecture.*

**EPSY 351. Assistive Technology for Access**

This course will provide an introduction to alternate access to the computer as a tool for the performance of educational tasks. Included will be an exploration of alternate and adaptive pointing and keyboard devices as well as software to enhance accessibility and productivity for persons with motor impairment, sensory

challenges, and cognitive difficulties. Emphasis in the course will be on assistive technology solutions and applications for persons with significant disabilities in the educational environment.

*3 credits, Lecture. Prerequisite: EPSY 350.*

**EPSY 352. Assistive Technology Across the Lifespan**

This course will focus on a holistic approach to the application of assistive technology across environments and across the lifespan. Included will be a description of universal design and environmental adaptations to increase access to community, vocational, educational, and recreational pursuits. Legal mandates of the ADA regarding physical and programmatic access will be presented. Assistive Technology solutions for environmental control, recreational pursuits and personal management will be overviewed. This is intended to be a final course for the sequence and will incorporate a summative case review.  
*3 credits, Lecture.*

**EPSY 353. Assistive Technology for the Struggling Learner**

This course will explore the use of assistive technology tools across a continuum of low to mid to high tech aid in the efficiency, organization, and productivity of the struggling learner.  
*3 credits, Lecture. Prerequisite: EPSY 350.*

**EPSY 354. Learning with Technology**

Uses a problem-based design format to integrate learning theory and principles with educational technology to develop an integrated lesson plan in a content area. Students select meaningful authentic problems to integrate.  
*3 credits, Lecture.*

**EPSY 355. Professional Seminar in Cognition & Instruction**

A professional seminar designed to present topics, paradigms, models, and theories in the various fields of educational psychology. The current research programs of the graduate faculty in Cognition and Instruction are presented for discussion in a seminar format.  
*1 credit, Seminar.*

**EPSY 356. Instructional Design**

Overview of the field of instructional design: instructional theories, prescriptive models, instructional strategies, issues and trends as they relate to the comprehensive development of instructional systems.  
*3 credits, Lecture.*

**EPSY 357. Community Living and Employment Options for People With Disabilities**

The contemporary approaches by which employment and community living options are matched with the choices and preferences of individuals with disabilities.  
*3 credits, Lecture.*

**EPSY 358. Applied Behavior Analysis**

Introduction to theories and application of behavioral techniques.  
3 credits, Lecture.

**EPSY 359. Theories of Learning, Cognition and Instruction**

Behavioral and cognitive psychology as it applies to instruction.  
3 credits, Lecture.

**EPSY 360. Introduction to Gifted Education and Talent Development**

Issues encountered in developing giftedness and talents in students: the nature of exceptional abilities, the history of special provisions, major scientific studies dealing with superior abilities, and contemporary educational systems and models.  
3 credits, Lecture.

**EPSY 361. Responding to Violence in the Schools**

Addresses how incidences of violence in the schools can be prevented, contained, and kept at a minimum with prevention programs, and immediate interventions to contain incidents of violence.  
1 credit, Seminar.

**EPSY 363. Language and Literacy for Students with Cognitive Disabilities**

3 credits, Lecture.

**EPSY 365. Creativity**

The identification of creative thinking and problem solving and the development and implications of creativity training materials and teaching strategies.  
3 credits, Lecture.

**EPSY 366. Improving Students' Thinking Skills**

Designed for teachers and administrators who wish to acquire more information about current research, trends and practices within the field of thinking skills instruction. An overview of the field, with special emphasis on research-based practices, major programs, and models for the improvement of thinking skills.  
3 credits, Lecture.

**EPSY 367. Coordination and Articulation of Gifted Education Programs**

Coordination and articulation of enrichment programs between and among schools. Planning and developing both academic and art programs, budget preparation, staff selection and evaluation, staff development, scheduling and community relations.  
3 credits, Lecture.

**EPSY 368. Social and Emotional Components of Giftedness and Talent Development**

Review of current research on affective growth and potential adjustment problems of gifted and talented youth. Vocational concerns, self-

concept, self-esteem, and the teacher's role in preventing or remediating affective problems related to giftedness.  
3 credits, Lecture.

**EPSY 369. Policy, Law, and Ethics in Special Education**

The impact of policy and law on the professional role of special educators.  
3 credits, Lecture.

**EPSY 370. Developing Schoolwide Enrichment Programs**

An overview of the theory and research behind and components within the Schoolwide Enrichment Model. Practical techniques for implementing the model in classrooms and school districts.  
3 credits, Lecture.

**EPSY 371. School-Based Systems Interventions**

Examination of current professional issues, theoretical models, and research related to the design interventions.  
3 credits, Lecture.

**EPSY 373. Strategies for Differentiating the Grade Level Curriculum**

Instructional and managerial techniques for use within or between classrooms to address learning differences among students. Strategies for improving academic achievement and success of diverse learners. Current and promising practices, as well as relevant research.  
3 credits, Lecture.

**EPSY 374. Software Design and Evaluation**

This course provides students with the knowledge and experience in design and evaluation of educational software.  
3 credits, Lecture.

**EPSY 375. Web-Based Learning**

Design, development, delivery and evaluation of web-based instruction.  
3 credits, Lecture. Prerequisites: EPSY 317, EPSY 335, EPSY 343, and EPSY 356.

**EPSY 381. Practicum**

The implementation and application of theory in the student's area of specialization. Open to master's and Sixth-Year students.  
1 - 6 credits, Practicum.

**EPSY 383. Grant Writing**

The grant procurement process is covered from identifying funding sources through initial grant management with a focus on actually writing a grant proposal.  
3 credits, Lecture.

**EPSY 384. Seminar**

Analysis of the issues and research in the field of education. Open to master's and Sixth-Year students.  
3 credits, Seminar.

**EPSY 387. Administration and Supervision of Special Education**

3 credits, Lecture.

**EPSY 388. Pupil Personnel Services**

The course addresses all areas of pupil personnel services other than special education. Emphasis is on administration of pupil personnel programs in public schools.  
3 credits, Lecture.

**EPSY 392. Rehabilitation Psychology**

The field of rehabilitation is going through a paradigm shift which is having profound influences on the roles and functions of rehabilitation psychologists and other professionals. Examines the key factors responsible for these changes and the implications these changes have for rehabilitation professionals.  
3 credits, Lecture. Prerequisite: EPSY 328.

**EPSY 394. Multi-Cultural Parent-Professional Alliances**

Alliance-building processes between helping professionals and parents. Multi-cultural relationship development.  
3 credits, Lecture.

**EPSY 395. Ethics in Educational and Professional Psychology**

Explores the nature of professional virtue in psychology and related educational and human service disciplines.  
3 credits, Lecture.

**†GRAD 395. Master's Thesis Research**

1 - 9 credits.

**†GRAD 396. Full-Time Master's Research**

3 credits.

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

3 credits.

**GRAD 398. Special Readings (Master's)**

Non-credit.

**GRAD 399. Thesis Preparation**

Non-credit.

**EPSY 401. Advanced Group Processes**

Participant/observers in a basic group course. Processing and analyzing of group processes.  
3 credits, Lecture. Instructor consent required.

**EPSY 403. Group Facilitation**

Lead groups, receive feedback and study group dynamics and leadership.  
3 credits, Lecture. Instructor consent required.

**EPSY 405. Program Evaluation**

An overview of quantitative and qualitative procedures used in the evaluation of educational programs. Current trends and practical applications are stressed.  
3 credits, Lecture. Prerequisite: EPSY 309, EPSY 313, and EPSY 441.



**EPSY 406. Sampling Designs and Survey Research Methods in Education**

Probability and non-probability sampling, single- and multi-stage sampling, sampling errors, design effects, unit-of-analysis concerns, confidentiality/anonymity issues, questionnaire design, interview procedures, item development, question format, ethics.

*3 credits, Lecture. Prerequisite: EPSY 313.*

**EPSY 410. Doctoral Seminar**

Cooperative study of developments and problems in the student's area of study.

*1 – 3 credits, Seminar.*

**EPSY 412. Advanced Theories and Techniques in Career Development**

An extensive and intensive survey of the major career development theories with an emphasis on the applicability of the theories in psychological career counseling. Models and methods of career counseling will be reviewed and integrated from the different theoretical perspectives.

*3 credits, Lecture.*

**EPSY 415. Appraisal Procedures in Counseling**

Use of instruments for estimating abilities, achievements, interest and personality; interpretation of appraisal procedures in counseling.

*3 credits, Laboratory. Prerequisite: EPSY 312 and EPSY 342.*

**EPSY 416. Counseling: Advanced Practice**

Continuing the work begun in EPSY 316; to strengthen and extend helping skills.

*3 credits, Lecture. Instructor consent required. Prerequisite: EPSY 316.*

**EPSY 417. Social Cognition**

Theory, research, and applications of social cognitive theory.

*3 credits, Lecture.*

**EPSY 418. Situated Cognition**

Theory, research and applications of situated cognition and situated learning.

*3 credits, Seminar. Prerequisite: EPSY 356, EPSY 335, and EPSY 359.*

**EPSY 426. Counseling Interventions: Assessment, Design, and Implementation**

The design, implementation and evaluation of counseling intervention with a focus on the crises and issues faced by clients who seek counseling.

*3 credits, Lecture. Prerequisite: EPSY 341 and EPSY 447.*

**EPSY 429. Cross-Cultural Counseling**

Theories, skills and practices of counseling with culturally different persons in mental health settings.

*3 credits, Lecture. Prerequisite: EPSY 316 and EPSY 416.*

**EPSY 430. Consultation Theories and Practices**

Theories and practices of professional consultation with an emphasis on actual interventions in schools, corporations and social service agencies.

*3 credits, Lecture.*

**EPSY 434. Advanced Educational Technology**

Readings, research and development of instructional materials using applications of advanced educational technology.

*3 credits, Lecture.*

**EPSY 436. Measurement Theory and Application**

An advanced course in measurement and evaluation. The course emphasizes current issues in measurement and the scientific procedures reflected in the literature that suggest alternative solutions to these issues.

*3 credits, Lecture.*

**EPSY 437. Item Response Theory**

An advanced course in educational and psychological testing theory. This course emphasizes the principles and processes of the most sophisticated approach to educational test construction and scoring available today.

*3 credits, Lecture.*

**EPSY 438. Instructional Psychology**

An advanced course relating theories of cognition, behaviorism and instructional design. Topics include thinking, problem solving, the development of expertise and both automatic and controlled processing.

*3 credits, Seminar. Prerequisites: EPSY 342, EPSY 356, and EPSY 359.*

**EPSY 439. Measurement in Cognitive Psychology**

Review of theory and research related to the measurement of variables in cognitive psychology such as domain knowledge, strategy knowledge, and motivation. Specific emphasis will be placed on the use of statistical theories and tools employed to study the reliability and validity of test scores. These tools include: generalizability theory, factor analysis, item response theory, and multidimensional scaling.

*3 credits, Lecture.*

**EPSY 440. Logistic and Hierarchical Linear Models**

In-depth coverage of specialized topics in educational statistics including logistic regression and hierarchical linear models.

*3 credits, Lecture.*

**EPSY 441. Methods and Techniques of Educational Research**

A survey of the principal methods employed in the investigation of educational problems, including problem formulation, stating hypotheses, sampling, instrument design, types of research methods and design principles.

*3 credits, Lecture.*

**EPSY 447. Field Work in Counseling and Personnel**

Supervised experience in counseling and related practices in schools and agencies with a concurrent supervisory seminar.

*3 credits, Practicum. Instructor consent required.*

**EPSY 448. School Psychology and Counseling Internship**

Post practicum experience in school psychology or counseling psychology under the supervision of a fully trained professional for the duration of one school year.

*3 credits, Practicum.*

**EPSY 459. Curricular Options for High Ability Learners**

Curriculum theory and techniques with special attention to the development of instructional materials.

*3 credits, Lecture.*

**EPSY 460. Doctoral Practicum**

The implementation and application of theory in the student's area of specialization.

*1 – 6 credits, Practicum. Instructor consent required.*

**EPSY 468. Doctoral Internship in Counseling and School Psychology**

Intensive, one year supervised experience in a counseling or school psychology setting totalling 1,500 or 2,000 hours of service.

*3 credits, Practicum.*

**EPSY 482. Design and Production of Multimedia Presentations**

Students will prepare presentations using slides, motion pictures, audiotapes and overhead transparencies; and will explore application of other technological developments to multimedia uses.

*3 credits, Lecture.*

**EPSY 484. Video Design for Learning**

Advanced principles of the video medium and its application to the learning process, instructional message design and the implementation of existing and emerging video delivery systems.

*3 credits, Lecture.*

**†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

**†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

## KINESIOLOGY

*Department Head:* Professor Carl M. Maresh

*Professors:* Armstrong, Kraemer, Shivers, and Yiannakis

*Associate Professors:* Morrone and Servedio

*Assistant Professors:* Bruening, Casa, VanHeest, and Volek

The Department of Kinesiology offers graduate programs leading to the degrees of Master of Arts in the field of Education and Doctor of Philosophy in the field of Kinesiology. Students should consult the statement under Education for information pertaining to admissions requirements.

The majority of graduate courses given during the academic year are taught afternoons or in the evenings. Full-time master's degree students must attend at least one summer session to accumulate in one calendar year the minimum of 30 credits required for graduation. Master's degree programs emphasizing exercise science are two-year programs and require a master's thesis.

### COURSES OF STUDY

#### †EKIN 300. Independent Study

1 – 6 credits, *Independent Study*. Instructor consent required.

#### EKIN 301. Theory and Methods of Research

Theoretical and empirical foundations of quantitative and qualitative research in sport and leisure science including research design, implementation and statistical analysis.  
3 credits, *Lecture*.

#### EKIN 304. Philosophy of Recreation

Historical, ethical, and cultural developments that have shaped present day concepts.  
3 credits, *Lecture*.

#### EKIN 306. Leisure: A Psychosocial Perspective

An investigation of the functions and consequences of leisure behavior on psychosocial growth, and its impact on the quality of life, at different stages of the life cycle.  
3 credits, *Lecture*.

#### EKIN 308. Management of Sport and Leisure Services

Management processes and practices involved in operating sport and recreational organizations.  
3 credits, *Lecture*.

#### EKIN 309. Therapeutic Recreational Service

The assessment, use of modalities, treatment team operation, and discharge planning procedures for rehabilitation.  
3 credits, *Lecture*.

**EKIN 310. Recreational Services for the Aging**  
Demographics, vulnerabilities, and life enhancement programming through recreational experience.  
3 credits, *Lecture*.

#### EKIN 311. Exertional Heat Stroke

An in-depth examination of pathophysiology, prevention, recognition, treatment, and return to play considerations for exertional heat stroke, with a secondary emphasis on all exertional heat illnesses.  
3 credits, *Seminar*. Instructor consent required.

#### EKIN 312. Sport Marketing

This course examines the application of marketing principles to collegiate and professional sport, event promotions, and commercial and public organizations.  
3 credits, *Lecture*.

#### EKIN 315. Sport Industry Analysis

Basic concepts and perspectives for analyzing the sport industry.  
3 credits, *Lecture*. Instructor consent required.

#### EKIN 360. Exercise Metabolism

Influence of aerobic and anaerobic exercise on energy metabolism and the utilization of nutrients, as viewed from the perspectives of physiology, a variety of sports, heredity, maturation, and disease.  
3 credits, *Lecture*.

#### EKIN 362. Thermal Physiology

Detrimental effects which exercise in the heat and dehydration have on: cardiovascular function, strength, endurance, fluid-electrolyte balance, disposition, and heat tolerance.  
3 credits, *Lecture*.

#### EKIN 364. Scientific Presentations

Skills required for: writing scientific articles/abstracts, reviewing manuscripts, and presenting results at scientific meetings.  
3 credits, *Lecture*.

#### EKIN 366. Scientific Instrumentation

Scientific instruments in the Human Performance Laboratory. Development of skills necessary to perform analyses on these instruments.  
3 credits, *Lecture*.

#### EKIN 368. Physiology of Stressful Environments

Exercising and resting responses/adaptations/illnesses to high altitude, cold, hyperbaric, polluted, and zero gravity environments. The acute and chronic effects of electromagnetic radiation fields and sleep deprivation will also be studied.  
3 credits, *Lecture*.

#### EKIN 377. Legal Aspects of Sport

Tort law principles specific to sport, fitness and recreational activities.  
3 credits, *Lecture*.

#### EKIN 378. Biomechanical Analysis of Sport Performance

Quantitative research in sport motion, two-dimensional and three-dimensional analysis, kinematic and kinetic analysis, instrumentation (videography, computer systems).  
3 credits, *Lecture*.

#### EKIN 381. Sport Sociology

The structure and function of sport as an institution, including issues and controversies involving gender, race, and intercollegiate, professional, and children's sports.  
3 credits, *Lecture*.

#### EKIN 382. Psychological Aspects of Sport

The behavioral variables that affect an individual's performance in sport.  
3 credits, *Lecture*.

#### EKIN 384. Seminar

Issues and research in the biological and social science fields.  
3 credits, *Seminar*.

#### EKIN 385. Sport Subcultures

Culture, social structure and background characteristics of participants in selected sport activities.  
3 credits, *Lecture*. Prerequisite: EKIN 381.

#### EKIN 387. Sport and Socialization

Processes and theoretical bases for individual involvement in sport, learning through sport, and disengagement from sport.  
3 credits, *Lecture*. Prerequisite: EKIN 381.

#### EKIN 390. Internship

The application and implementation in a work situation of theories and practices related to the student's area of specialization.  
6 credits, *Practicum*.

#### EKIN 392. Muscle Physiology in Exercise and Sport

Structural, morphological and biochemical changes in muscle with exercise and training.  
3 credits, *Lecture*.

#### EKIN 393. Physiology of Human Performance

Selected physiological principles related to exercise stress, including related laboratory experience.  
3 credits, *Lecture*.

**EKIN 395. International Tourism: Contemporary Theory and Research**

The tourist, tourist-host relations, structure of the tourist industry, and the impact of tourism on host nations.  
3 credits, Lecture.

**†GRAD 395. Master's Thesis Research**

1 - 9 credits.

**†GRAD 396. Full-Time Master's Research**

3 credits.

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

3 credits.

**GRAD 398. Special Readings (Master's)**

Non-credit.

**GRAD 399. Thesis Preparation**

Non-credit.

**EKIN 401. Leisure Theory Analysis**

Various theories of leisure from classical to contemporary times.  
3 credits, Lecture.

**EKIN 410. Seminar**

Cooperative study of developments and problems in the student's area of specialization.  
1 - 6 credits, Seminar.

**EKIN 416. Advanced Sport Sociology**

Advanced topics in sport sociology and sport psychology with special emphasis on those models and theoretical perspectives that are associated with generating significant research in the area.  
3 credits, Lecture.

**EKIN 460. Practicum**

The implementation and application of theory in the student's area of specialization. Primarily for doctoral students.  
1 - 6 credits, Practicum.

**†GRAD 495. Doctoral Dissertation Research**

1 - 9 credits.

**†GRAD 496. Full-Time Doctoral Research**

3 credits.

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

3 credits.

**GRAD 498. Special Readings (Doctoral)**

Non-credit.

**GRAD 499. Dissertation Preparation**

Non-credit.

## **ELECTRICAL ENGINEERING**

*Department Head:* Professor Robert Magnusson  
*Professors:* Anwar, Bansal, Bar-Shalom, Enderle, Fox, Jain, Javidi, Luh, Pattipati, Spencer, Taylor, and Willett

*Research Professors:* Boggs and Roychoudhuri

*Associate Professors:* Ayers and Donkor

*Assistant Professors:* Escabi and Q. Zhu

Several areas of study and research leading to M.S. and Ph.D. degrees are offered: biomedical engineering, control and communication systems, electromagnetics and physical electronics. Students may also choose to pursue an M.S. degree in Electrical Engineering without a concentration.

The significant involvement of the Department of Electrical and Computer Engineering in interdisciplinary programs is indicative of the broad scope of its basic interests and activities. Admission to one of the programs does not require an undergraduate degree in electrical engineering. It is quite common for graduate students with undergraduate degrees in other fields of engineering or in biology, mathematics, physics, psychology, or statistics to hold fellowships, assistantships, and part-time instructorships in the Department of Electrical and Systems Engineering. This mixing of graduate students and faculty with a wide variety of backgrounds in a single department makes it possible to bring a diversity of ideas into all the departmental research projects.

Departmental activities in control and communication systems include research in people-machine systems, societal and transportation systems, multivariable system theory, digital control systems, digital and optical signal processing, optical computing, image analysis and processing, optoelectronic neural networks computer-aided design, estimation theory, adaptive control, stochastic communication and control, and coding theory. Activities in electromagnetics and physical electronics include research in diffractive optics, optoelectronics, electro-optics, quantum electronics, semiconductor lasers, semiconductor heterojunctions with application to integrated circuits, solar cells, a new field approach to thermodynamics and statistical mechanics as applied to the electron transport theory, antenna design, microwave technology, and high voltage engineering. Separate listings should be consulted for detailed information concerning biomedical engineering, computer science and engineering, and materials science.

**Special Requirements for the Ph.D. Program.** Admitted students must submit evidence of capacity for independent study in the form of a master's thesis or comparable achievement.

For information regarding fellowships, assistantships, and part-time instructorships, the applicant should address the chairperson of the Biomedical Engineering Graduate Admissions Committee, Control and Communications Graduate

Admissions Committee, or the Electromagnetics and Physical Electronics Graduate Admissions Committee, depending upon the major interest of the applicant. The address in every case is 260 Glenbrook Road, U-157, Room 312, Storrs, Connecticut 06269-3157.

**Special Requirements for the Ph.D. Program.** Admitted students must submit evidence of capacity for independent study in the form of a master's thesis or comparable achievement.

For information regarding fellowships, assistantships, and part-time instructorships, the applicant should address the chairperson of the Biomedical Engineering Graduate Admissions Committee, Control and Communications Graduate Admissions Committee, or the Electromagnetics and Physical Electronics Graduate Admissions Committee, depending upon the major interest of the applicant. The address in every case is 260 Glenbrook Road, Unit 2157, Room 312, Storrs, Connecticut 06269-2157.

**Special Facilities.** Departmental facilities include the following research laboratories: Biomedical Instrumentation Laboratory, Cyber Laboratory, Electrical Insulation Research Laboratory, Central Laboratory for Imaging Research, Micro/Opto-electronics Research Laboratory, Optical Signal Processing/Computing Laboratory, Manufacturing Systems Laboratory, and the Photonics Research Laboratory. Included in these laboratories are a variety of computers and workstations, interface facilities, a clean room with semiconductor growth and characterization facilities, MBE and MOVPE facilities, and other specialized equipment. A well-equipped departmental sun workstation laboratory is available for general student use. The Taylor L. Booth Center for Computer Applications and Research is available for appropriate projects. Several graphics, personal computer and work station laboratories in the School of Engineering are available for student/faculty research. The University Computer Center, featuring an IBM Enterprise Server (mainframe), is also available. Fellowships, assistantships, and part-time instructorships are available.

### **COURSES OF STUDY**

Registration restrictions: In addition to the listed prerequisites, approval of the Department head and instructor is required for non-degree students for registration in all courses.

**ECE 300. Special Topics in Electrical and Systems Engineering**

Classroom and/or laboratory courses in special topics as announced in advance for each semester.

1 - 3 credits, Lecture.

**ECE 301. Introduction to System Theory**

Modeling and analysis of linear systems. Introduction to functions of a complex variable. Linear algebra with emphasis on matrices, linear transformations on a vector space, and matrix



formulation of linear differential and difference equations. State variable analysis of linear systems. Transform methods using complex variable theory, and time-domain methods including numerical algorithms. Recommended preparation: ECE 202.  
*3 credits, Lecture.*

**ECE 302. Linear Multivariable System Design**  
Observability and controllability. Application of canonic forms in system design. Methods of pole placement. Observer design. Noninteracting multivariable systems.  
*3 credits, Lecture. Prerequisite: ECE 301.*

**ECE 307. Dielectric and Magnetic Materials Science**  
The macroscopic and microscopic views of dielectric and magnetic materials. Theories of spontaneous polarization and magnetization. Applications of anisotropic materials. Non-linear dielectrics at radio and optical frequencies. Superconductivity and superconducting magnets.  
*3 credits, Lecture.*

†**ECE 311. Seminar**  
Presentation and discussion of advanced electrical engineering problems.  
*1 credit, Seminar.*

**ECE 313. Applied Probability and Stochastic Processes**  
Statistical methods for describing and analyzing random signals and noise. Random variables, conditioning and expectation. Stochastic processes, correlation, and stationarity. Response of linear systems to stochastic inputs. Applications.  
*3 credits, Lecture. Prerequisite: ECE 301.*

**ECE 314. Information Theory**  
Basic concepts: entropy, mutual information, transmission rate and channel capacity. Coding for noiseless and noisy transmission. Universal and robust codes. Information-theoretic aspects of multiple-access communication systems. Source encoding, rate distortion approach.  
*3 credits, Lecture. Prerequisite: ECE 313.*

**ECE 316. Digital Signal Processing**  
Discrete-time signals and systems. The  $z$ -transform. The Discrete Fourier Transform (DFT). Convolution and sectioned convolution of sequences. IIR and FIR digital filter design and realization. Computation of the DFT: The Fast Fourier Transform (FFT), algorithms. Decimation and interpolation. Parametric and nonparametric spectral estimation. Adaptive filtering. Finite word length effects.  
*3 credits, Lecture.*

**ECE 317. Advanced Signal Processing**  
Wiener filter theory. Linear prediction. Adaptive linear filters: LMS and RLS algorithms, variants, lattice structures and extra-fast implementation. Convergence properties. High resolution

spectral estimation. Hidden Markov models, Monte-Carlo methods for signal processing. Multiresolution decomposition and wavelets. Blind methods.  
*3 credits, Lecture. Prerequisites: ECE 313 and ECE 316.*

**ECE 318. Neural Networks for Classification and Optimization**  
This course provides students with an understanding of the mathematical underpinnings of classification techniques as applied to optimization and engineering decision-making, as well as their implementation and testing in software. Particular attention is paid to neural networks and related architectures. The topics include: Statistical Interference and Probability Density Estimation, Single and Multi-layer Perceptions, Radial Basis Functions, Unsupervised Learning, Preprocessing and Feature Extraction, Learning and Generalization, Decision Trees and Instance-based Classifiers, Graphical Models for Machine Learning, Neuro-Dynamic Programming.  
*3 credits, Lecture.*

**ECE 320. Independent Study in Electrical Engineering**  
Individual exploration of special topics as arranged by the student with an instructor of his or her choice.  
*1 – 6 credits, Independent Study. Instructor consent required.*

**ECE 322. Modern Manufacturing System Engineering**  
Issues and methods in modern manufacturing systems. Integrated product and process development. Design for quality, on-line quality control and improvement, reliability during product development, and design for testability. Computer-aided production management, production planning and scheduling, and optimization-based planning and coordination of design and manufacturing activities. Targeted toward students, professional engineers, and managers who want to have an impact on the state-of-the-art and practice of manufacturing engineering, and to improve manufacturing productivity  
*3 credits, Lecture.*

**ECE 327. Fuzzy and Neural Approaches to Engineering**  
Fuzzy sets, applications to fuzzy logic and fuzzy control, and concepts and methodologies for fuzzy optimization. Fundamental models of neural networks, learning rules, and basic recurrent networks for optimization. The integration of fuzzy systems with neural networks. Examples from engineering applications.  
*3 credits, Lecture. Prerequisite: ECE 301.*

**ECE 329. Computational Methods for Optimization**  
Computational methods for optimization in static

and dynamic problems. Ordinary function minimization, linear programming, gradient methods and conjugate direction search, nonlinear problems with constraints. Extension of search methods to optimization of dynamic systems, dynamic programming.  
*3 credits, Lecture. Prerequisite: ECE 301.*

**ECE 330. Optimal Control Systems**  
Optimization techniques for linear and nonlinear systems. Calculus of variations, dynamic programming, and the Pontryagin maximum principle. Computational methods in optimal control.  
*3 credits, Lecture. Prerequisite: ECE 301.*

**ECE 331. Nonlinear System Theory**  
Stability of time-varying nonlinear systems. Liapunov's direct method. Describing functions. Popov's stability criterion. Adaptive control.  
*3 credits, Lecture. Prerequisite: ECE 301.*

**ECE 332. Information, Control, and Games**  
*3 credits, Lecture. Prerequisite: ECE 301 and ECE 313.*

**ECE 333. Man-Machine Systems Analysis**  
Role of the human as a decision and control element in a feedback loop. Mathematical models of human control characteristics and instrument monitoring behavior. Effects of human limitations upon overall task performance. Parallel discussion of measurement and experimental techniques. Validation of theoretical results by comparisons with existing human response data.  
*3 credits, Lecture. Prerequisite: ECE 301 and ECE 313.*

**ECE 334. Experimental Investigation of Control Systems**  
A study of experimental techniques and advanced design of control systems.  
*3 credits, Lecture. Instructor consent required. Prerequisite: ECE313 and ECE331.*

**ECE 335. Advanced Computer Networks and Distributed Processing Systems**  
Design and evaluation of distributed computer communication and processing systems. Case studies, development of suitable queuing and other models to describe and evaluate design problems such as capacity assignment, concentration and buffering, network topology design, routing, access techniques, and line control procedures.  
*3 credits, Lecture. This course and CSE 330 may not both be taken for credit.*

**ECE 336. Stochastic Models for the Analysis of Computer Systems and Communication Networks**  
Continuous and discrete-time Markov chains and their applications in computer and communication network performance and reliability evaluation. Little's theorem and applications; review of stochastic processes; simple Markovian queues; open, closed, and mixed product-

form networks; computational algorithms for closed and mixed product form networks; flow-equivalence and aggregation; M/G/1 queue with vacations and applications to time-division and frequency-division multiplexing; reservations and polling; multi-access communication; reliability and performability models of computer systems.

*3 credits, Lecture. Prerequisite: ECE 313.*

### **ECE 337. VLSI Fabrication Principles**

Semiconductor materials and processing, emphasizing compound semiconductors, optoelectronic materials, shallow devices, and fine-line structures. Semiconductor material properties; phase diagrams; crystal growth and doping; diffusion; epitaxy; ion implantation; oxide, metal, and silicide films; etching and cleaning; and lithographic processes.

*3 credits, Lecture. Instructor consent required.*

### **ECE 338. Semiconductor Devices and Models**

Band theory, conduction in semiconductors, carrier statistics, deep levels, impurities with multiple charge states, heavy doping effects, non-uniform doping. Non-equilibrium processes, carrier scattering mechanisms, the continuity equation, avalanche multiplication, carrier generation, recombination, and lifetime. P-n junctions, non-abrupt junctions, various injection regimes, and device models. Metal semiconductor junctions, current transport mechanisms, and models. BJT, JFET, MESFET, and MOSFET, and device models.

*3 credits, Lecture.*

### **ECE 339. Fundamentals of Opto-Electronic Devices**

Absorption and emission mechanisms in direct and indirect semiconductors. Semiconductor optoelectronic devices such as light-emitting diodes, injection lasers, photocathodes, solar cells, and integrated optics.

*3 credits, Lecture.*

### **ECE 340. Electronic Materials**

Physical and electronic properties, and device applications of disordered materials including amorphous semiconductors, liquid crystals, bubble-memory magnetic materials. Applications of amorphous semiconductors including xerography and solar cells.

*3 credits, Lecture. Prerequisite: ECE 245 or Metallurgy 313.*

### **ECE 341. MOS Device and VLSI Fundamentals**

Physics of MOS capacitors and transistors, derivation of V-I relation expressing subthreshold, threshold, and saturation region behavior; short-channel effects in scaled-down transistors; scaling laws; VLSI fabrication technologies; design and layout gates and gate arrays; physics, device layout and design of semiconductor memories including static and dynamic RAMs. Laboratory emphasizes introduction to nonvolatile RAMs; computer aids in VLSI design;

schematic capture, SPICE simulation, layout of custom IC's, and VHDL.

*4 credits, Lecture.*

### **ECE 342. Electronic Theory of Semiconductors**

Topics include crystallography, energy bands in crystals, effective mass theorem, virtual energies and miniband formation in finite and infinite superlattice, electronics and holes in electric and magnetic fields, crystal vibrations (phonons), and theory of conduction in semiconductors.

*3 credits, Lecture.*

### **ECE 343. Thermodynamic Theory of Generalized Fields I**

Basic formulation and applications of the thermodynamic theory to interfacial phenomena including electrical conduction in nontunneling p-n junctions, heterojunctions, Schottky diodes, and in solar cells.

*3 credits, Lecture.*

### **ECE 344. Thermodynamic Theory of Generalized Fields II**

Fundamental relations of the temperature-position hyperspace. Boundary conditions of the hyperspace at the absolute zero. General solutions of the hyperspace equation applied to a number of interfacial phenomena, including the Seebeck and Peltier effects.

*3 credits, Lecture. Prerequisite: ECE 343.*

### **ECE 345. Nanotechnology**

*3 credits, Lecture.*

### **ECE 346. Microwave Techniques**

A theoretical analysis of microwave components, systems, and measuring techniques. Scattering matrix analysis is applied to microwave devices having two or more ports.

*3 credits, Lecture.*

### **ECE 348. Electromagnetic Wave Propagation**

Engineering application of Maxwell's field theory to electromagnetic wave propagation in various media. Reflection, refraction, diffraction, dispersion, and attenuation. Propagation in sea water and in the ionosphere.

*3 credits, Lecture. Prerequisite: ECE 207 or Physics 306.*

### **ECE 349. Antenna Theory and Applications**

Analysis and synthesis of antenna systems including electric- and magnetic-dipole, cylindrical, helical, reflector, lens, and traveling-wave antennas. Theory of arrays including patterns, self and mutual impedances.

*3 credits, Lecture.*

### **ECE 350. Advanced Optoelectronics**

Review of optoelectronic devices and integrated circuit (IC) technologies (analog and digital); logic gates; self-electro-optic devices (SEEDs), microlasers, Fabry-Perot (F-P) etalons and optoelectronic IC (OEICs); modulators: F-P

modulators (absorptive and refractive), spatial light modulators (SLMs) and their applications; bistable devices; bistable laser amplifiers, resonant tunneling transistor lasers, and polarization bistability; optical interconnects; architectural issues and optical processors based on S-SEED, optical neural networks, and other devices.

*3 credits, Lecture. Prerequisite: ECE 339.*

### **ECE 351. Advanced Semiconductor Devices**

Fundamental properties of heterostructures, strained-layer superlattices, NIPI structures, multiple quantum well, quantum wire, and quantum dot structures. Operation, modelling of the electrical characteristics, design, and applications of HBJT, HEMT, and resonant tunneling devices. Second-order effects in submicron MOSFETs and MESFETs.

*3 credits, Lecture.*

### **ECE 352. Transport in Semiconductors**

Topics include theory of energy bands in crystals; carrier scattering; the Boltzman equation and its approximations; low field transport; high field effects; transport in heterojunctions; quantum effects; and Monte Carlo simulation.

*3 credits, Lecture. Prerequisite: ECE342 or Physics 322.*

### **ECE 353. Fundamentals of Photonics**

*3 credits, Lecture. Instructor consent required.*

### **ECE 354. Optical Systems Engineering**

Design and analysis of paraxial optical systems, including stable and unstable laser resonators, and the propagation of geometric beams, Gaussian beams, and plane waves through complex optical systems. Topics include ray optics; ray matrices; polarization of light; diffraction theory; the connection between geometrical optics and diffraction; and performance analysis.

*3 credits, Lecture.*

### **ECE 355. Optical Waveguides**

Propagation of electromagnetic waves in dielectric slab and fiber waveguides as described by geometrical ray optics and normal mode analysis. Integrated optic guides, step and graded index fiber guides. Single mode vs. multimode transmission, coupling, and other system considerations.

*3 credits, Lecture.*

### **ECE 356. Lasers for Optoelectronics**

Optoelectronic components as needed for fiberoptic communications, optical switching, and optical interconnect. Semiconductor, solid state, and gas lasers. Waveguide and vertical cavity structures for modulators, detectors, and amplifiers and the relevance of bipolar and field-effect transistors for integration of systems on a chip. Approaches for long-wavelength optoelectronic integration for Gb/s long distance

transmission, the integration of components for optical interconnection in computers and processors, and WDM techniques for optical network applications.

*3 credits, Lecture. Prerequisites: ECE 245 or ECE 338, and ECE228 or ECE353.*

#### **ECE 357. Advanced Numerical Methods in Scientific Computation**

Development, application and implementation of numerically stable, efficient and reliable algorithms for solving matrix equations that arise in modern systems engineering. Computation of matrix exponential, generalized inverse, matrix factorizations, recursive least squares, eigenvalues and eigenvectors, Lyapunov and Riccati equations.

*3 credits, Lecture. Prerequisite: ECE 301.*

#### **ECE 358. Nonlinear Optical Devices**

Wave propagation in nonlinear media, generation of harmonics in optical materials, optical parametric processes, stimulated emission and scattering processes. Device modeling and application of fiber and semiconductor lasers, optical amplifiers and modulators. Electro-optic, acousto-optic, and magneto-optic devices. Soliton generation and propagation.

*3 credits, Lecture. Prerequisite: ECE 353.*

#### **ECE 361. Communication Theory**

Design and analysis of digital communication systems for noisy environments. Vector representation of continuous-time signals; the optimal receiver and matched filter. Elements of information theory. Quantization, companding, and delta-modulation. Performance and implementation of common coherent and non-coherent keying schemes. Fading; intersymbol interference; synchronization; the Viterbi algorithm; adaptive equalization. Elements of coding.

*3 credits, Lecture. Prerequisite: ECE 313.*

#### **ECE 362. Estimation Theory and Computational Algorithms**

Estimation of the state and parameters of noisy dynamic systems with application to communications and control. Bayesian estimation, maximum-likelihood and linear estimation. Computational algorithms for continuous and discrete processes, the Kalman filter, smoothing and prediction. Nonlinear estimation, multiple model estimation, and estimator Kalman, multiple model estimation, and estimator design for practical problems.

*3 credits, Lecture. Prerequisite: ECE 301 and ECE 313.*

#### **ECE 363. Stochastic Control**

Methods of decision-making and control in a stochastic environment. Elements of utility theory. Principle of optimality and deterministic dynamic programming. Stochastic dynamic programming. Control of dynamic systems with imperfect state information. Certainty equiva-

lence and the control's dual effect. Sequential hypothesis testing. Passive and active stochastic adaptive control algorithms. Decentralized control methods.

*3 credits, Lecture. Prerequisite: ECE 301 or ECE313.*

#### **ECE 364. Linear Programming and Network Flows**

Computational methods for linear programming with special emphasis on sequential and parallel algorithms for Network Flow Problems. Standard and canonical forms of linear programming, revised Simplex methods, basis updates, decomposition methods, duality, shortest paths, minimal spanning trees, maximum flows, assignment problems, minimum cost network flows, and transportation problems.

*3 credits, Lecture. Prerequisite: ECE 301.*

#### **ECE 365. Advanced Signal Detection**

Focus on discrete-time detection of signals in noise which is not necessarily Gaussian. Topics include: classical Neyman-Pearson and Bayes theory, efficacy and asymptotic relative efficiency; some canonical noise models; quantized detection; narrowband signal detection; distance measures and Chernoff bounds; sequential detection; robustness; non-parametric detection; continuous-time detection and the Karhunen-Loève expansion.

*3 credits, Lecture.*

#### **ECE 366. Optical Information Processing**

Two-dimensional signal processing using optical techniques. Topics include: review of two-dimensional linear system theory; scalar diffraction theory, Fresnel and Fraunhofer diffraction; Fourier transforming and imaging properties of lenses; image formation; frequency analysis of optical imaging systems; modulation transfer function; two-dimensional spatial filtering; coherent optical information processing; frequency-domain spatial filter synthesis; holography, Fourier and nonlinear holograms.

*3 credits, Lecture.*

#### **ECE 368. Wireless Communication**

Introduces basic concepts in wireless communication and networks with emphasis on techniques used in the physical layer of current and future wireless communication systems. Covers channel modeling, modulation, spread spectrum techniques, multiuser communication theory, wireless network protocols, and current cellular and PCS systems. Special topics in equalization and array signal processing are included.

*3 credits, Lecture. Prerequisite: ECE 316 and ECE 361.*

#### **ECE 369. Pattern Recognition and Neural Networks**

Review of probability and stochastic processes. Statistical pattern recognition. Nonlinear signal processing and feature extraction. Correlation filters. Metrics for pattern recognition. Bayesian

classifiers. Minimum probability of error processors. Supervised and unsupervised learning. Perception learning methods. Multilayer neural networks. Applications to security and encryption.

*3 credits, Lecture.*

#### **ECE 370. Biomedical Instrumentation I**

Origins of bioelectric signals; analysis and design of electrodes and low-noise preamplifiers used in their measurement. Statistical techniques applied to the detection and processing of biological signals in noise, including the treatment of nerve impulse sequences as stochastic point processes. Methods of identifying the dynamic properties of biosystems.

*3 credits, Lecture. Prerequisite: ECE 313.*

#### **ECE 372. Communication and Control in Physiological Systems**

Processing, transmission, and storage of information in nerve systems. Mechanisms of neuro-sensory reception, coding and signal-to-noise ratio enhancement. Analysis of invertebrate and vertebrate visual systems. Neural spatio-temporal filters in feature extraction and pattern recognition. Analysis of control systems and regulators associated with vision: e.g., gaze control, accommodation, pupil area, and intra-ocular pressure.

*3 credits, Lecture.*

#### **ECE 373. Biomedical Instrumentation Laboratory**

Experimental investigation of electrodes, transducers, electronic circuits, and instrumentation systems used in biomedical research and in clinical medicine.

*3 credits, Laboratory. Instructor consent required.*

#### **ECE 374. Digital Image Processing**

Problems and applications in digital image processing, two-dimensional linear systems, shift invariance, 2-D Fourier transform analysis, matrix Theory, random images and fields, 2-D mean square estimation, optical imaging systems, image sampling and quantization, image transforms, DFT, FFT, image enhancement, two-dimensional spatial filtering, image restoration, image recognition, correlation, and statistical filters for image detection, nonlinear image processing, and feature extraction.

*3 credits, Lecture. Prerequisite: ECE 241 or ECE 247.*

#### **ECE 377. Engineering Problems in the Hospital**

Given in collaboration with staff from the University's School of Medicine and from hospitals in Hartford. Aim is to familiarize the student with engineering problems in a modern hospital. Role of the small computer in the hospital; implanted pace-makers; heart catheterization. Students are expected to investigate and solve an engineering problem



associated with clinical medicine as a semester project.

*3 credits, Lecture. Instructor consent required.*

#### **ECE 378. Biomedical Imaging**

Fundamentals of detection, processing and display associated with imaging in medicine and biology. Topics include conventional and Fourier optics, optical and acoustic holography, optical and digital image enhancement, ultrasonography, thermography, isotope scans, and radiology.

Laboratory demonstrations will include holography and optical image processing.

*3 credits, Lecture.*

#### **ECE 379. Advanced Ultrasonic Imaging Technique**

Introduction to advanced techniques of ultrasonic image formation for biomedical applications.

Introduction to acoustic wave propagation.

A,B,C,M and Doppler ultrasonic imaging modes.

Interaction of ultrasound with biological tissues.

Acoustical holography. Ultrasonic transducer

design and calibration. Transducer arrays.

Ultrasound detection modes. Laboratory

demonstrations will include Schlieren visualiza-

tion of ultrasound fields and transducer

calibration techniques.

*3 credits, Lecture. Prerequisite: EE 378.*

#### **†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

#### **†GRAD 396. Full-Time Master's Research**

*3 credits.*

#### **†GRAD 397. Full-Time Directed Studies**

**(Master's Level)**

*3 credits.*

#### **GRAD 398. Special Readings (Master's)**

*Non-credit.*

#### **GRAD 399. Thesis Preparation**

*Non-credit.*

#### **†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

#### **†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

#### **†GRAD 497. Full-Time Directed Studies**

**(Doctoral Level)**

*3 credits.*

#### **GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

#### **GRAD 499. Dissertation Preparation**

*Non-credit.*

## **ENGINEERING**

*Dean: Professor Amir Faghri*

*Associate Dean for Academic Affairs:*

*Associate Professor Ian Greenshields*

#### **Master of Engineering Degree Program.**

The School of Engineering, in addition to the master's and doctoral degree programs described elsewhere in this *Catalog*, offers the M. Engr. degree with areas of concentration in: Civil and Environmental Engineering, Chemical Engineering, Computer Science and Engineering, Electrical and Systems Engineering, Mechanical Engineering, and Metallurgy and Materials Engineering.

The M. Engr. degree is designed to meet the needs of practicing engineering professionals who are employed full-time. Work toward this degree program can be completed on-site at company or at other convenient locations. The required curriculum consists of 28 graduate credits and completion of a project.

In addition to the general admission requirements of the Graduate School, the following also are required: verbal, quantitative, and analytical scores from the Graduate Record Examinations; evidence of demonstrated competence in the discipline, including but not limited to undergraduate research or field experience; and, whenever possible, a personal interview by a potential graduate advisor.



The courses listed below are of common interest to students in various engineering disciplines and is taught by faculty from the various departments within the School of Engineering. Other engineering courses are listed under the sponsoring departments. Reference should be made to the offerings of the Departments of Chemical Engineering, Civil and Environmental Engineering, Computer Science and Engineering, Electrical and Systems Engineering, Mechanical Engineering, and Metallurgy and Materials Engineering and to the interdisciplinary offerings in applied mechanics, biomedical engineering, environmental engineering, fluid dynamics, and polymer science.

### **COURSES OF STUDY**

#### **ENGR 300. Special Topics in Engineering**

Classroom and/or laboratory course in special topics as announced in advance for each semester.

*1 - 6 credits, Lecture.*

#### **ENGR 311. Professional Communication and Information Management**

Development of the advanced communication skills as well as information management required of engineers and engineering managers in industry, government, and business. Focus on (1) the design and writing of technical reports, articles, proposals and memoranda that address

the needs of diverse organizational and professional audiences; (2) the preparation and delivery of organizational and technical oral and multimedia presentations and briefings; (3) team building skills with an emphasis on communications; and (4) knowledge management.

*3 credits, Lecture.*

#### **ENGR 312. Engineering Project Planning and Management**

This course provides a methodology for managing engineering projects. Topics include project lifecycle, strategic planning, budgeting, and resource scheduling. Course work also includes work estimating, evaluating risk, developing the project team, project tracking and performing variance analysis. Case studies are used as class and homework assignments to focus the class on the topics presented.

*3 credits, Lecture. Department consent required.*

## ENGLISH

*Acting Department Head:* Professor John Gatta

*Aetna Professor of Writing:* L. Bloom

*Professors:* Anselment, Barreca, Benson, Charters, Eby, Higonnet, Hogan, Jacobus, MacLeod, Makowsky, Meyer, Miller, Murphy, Nelson, Peterson, Pickering, Riggio, Roberts, Sonstroem, and Wilkenfeld

*Associate Professors:* Biggs, Bradfield, Coundouriotis, Fairbanks, Hart, Hasenfratz, Hollenberg, Hufstader, Jambeck, Mahoney, Manning, Marsden, Phillips, Recchio, Shea, Tilton, and Turley

*Assistant Professors:* Brown, Chow, Kneidel, Sánchez, and Semenza

The Department of English offers courses in English language and composition theory, criticism, and literature written in English. Special research projects and courses of study in comparative literature, medieval studies, American studies, and linguistics are available in course sequences administered cooperatively with other departments. Comparative literature courses of study are conducted in cooperation with the Department of Modern and Classical Languages. The Medieval Studies Program is conducted in cooperation with the language department and the Departments of Art, Dramatic Arts, History, and Philosophy. The area of concentration in American Studies is offered in cooperation with the Departments of History, Political Science, and Sociology.

English courses numbered in the 300's series normally are broad studies of literary schools, periods, and topics and are open to both doctoral and master's candidates. Enrollment is limited to fourteen students. Seminars are numbered in the 400's series and are designed primarily for doctoral students, although they are open to a limited number of master's candidates. Enrollment in the seminars is limited to eight students. Independent study is available under English 400, a reading course normally open only to doctoral candidates.

**Admission to the M.A. and Ph.D. Programs.** *All applications for admission to the Ph.D. and applications for teaching assistantships and fellowships must be received by February 1.* All other applications together with letters, personal statement, writing sample and the Graduate Record Examination scores (for both General and Subject tests) should reach Storrs by April 1. Transcripts should reach Storrs by April 1.

**The M.A. Program.** Plan A requires the completion of fifteen credits of course work and nine credits of thesis work. Plan B requires the completion of twenty-four credits of course work and a written examination, which is taken near or at the close of course studies. Students select three subject areas in which to be examined. The examination is designed to test critical ability and awareness of literary history and theory.

**The Ph.D. Program.** Ordinarily, the plan of study is expected to contain twenty four credits of full-time graduate course work beyond the master's

degree. Before writing the dissertation, students take a series of preliminary examinations in selected literary subject areas.

**Special Facilities.** Library collections include "little magazines" and alternative press publications, the Charles Olson archives, and extensive Short Title Catalogue holdings. The English Department sponsors the Connecticut Writing Project, a program for teachers at all levels throughout the State. Funds endowing the Department's Aetna Professorship in Writing make possible a variety of innovative courses as well as prizes for outstanding student essays. Student creativity is encouraged in the yearly Wallace Stevens Poetry Prize competition, judged by a leading poet in a special presentation at Storrs. Faculty edit the journals *The Eighteenth Century: Theory and Interpretation*, *LIT*, and *MELUS* (Multi-ethnic Literature of the United States). Recent distinguished Visiting Professors have included Andrew Gurr, Derek Pearsall, and James Simpson.

### COURSES OF STUDY

#### ENGL 300. The Theory and Teaching of Writing

An exploration of the relationship between the theories and practice of writing, with attention given to recent classroom practices in composition.

*3 credits, Lecture. Open to graduate students in English, others with permission.*

#### ENGL 301. Approaches to Literature

An introduction to practical criticism. The nature of literature; the use of biography, psychology, and other background subjects in literary criticism; problems in literary history and analysis.

*3 credits, Lecture. Open to graduate students in English, others with permission.*

#### ENGL 302. Myth, Archetype and Literature

A study of myth and archetype in relation to literature of various genres and periods.

*3 credits, Lecture. Open to graduate students in English, others with permission.*

#### ENGL 303. Children's Literature

A study of Children's Literature from the aesthetic, historic, psychological and sociological points of view. Major themes and genres. Standards of literary criticism.

*3 credits, Lecture. Open to graduate students in English, others with permission.*

#### ENGL 304. The Bible as Literature

A study of major themes and literary characteristics of writing from the Hebrew Bible and New Testament. The Bible's relevance to modern literary criticism.

*3 credits, Lecture. Open to graduate students in English, others with permission.*

#### ENGL 308. History of the English Language

The development of the sounds, forms, order, and vocabulary of Standard English; an

introduction to the methods of modern descriptive linguistics, and to the application of linguistic fact and theory to the teaching of English.

*3 credits, Lecture. Open to graduate students in English and Medieval Studies, others with permission.*

#### ENGL 309. Old English

A study of the language and literature of pre-conquest England.

*3 credits, Lecture. Open to graduate students in English and Medieval Studies, others with permission.*

#### ENGL 310. Chaucer

*3 credits, Lecture. Open to graduate students in English and Medieval Studies, others with permission.*

#### ENGL 315. Medieval Literature

A study of medieval literature, exclusive of Chaucer.

*3 credits, Lecture. Open to graduate students in English and Medieval Studies, others with permission.*

#### ENGL 323. The English Drama to 1642

A survey of English drama from the beginnings until 1642. The plays of Marlowe, Kyd, Greene, Dekker, Middleton, Ben Jonson, Beaumont and Fletcher, Webster, Massinger and others are studied.

*3 credits, Lecture. Open to graduate students in English and Medieval Studies, others with permission.*

#### ENGL 325. Elizabethan Literature

A study of major writers and literary traditions of the sixteenth century, exclusive of the drama.

*3 credits, Lecture. Open to graduate students in English and Medieval Studies, others with permission.*

#### ENGL 326. Seventeenth-Century Literature

*3 credits, Lecture. Open to graduate students in English and Medieval Studies, others with permission.*

#### ENGL 329. Milton

*3 credits, Lecture. Open to graduate students in English and Medieval Studies, others with permission.*

#### ENGL 330. Shakespeare

*3 credits, Lecture. Open to graduate students in English, others with permission.*

#### ENGL 335. Restoration and Eighteenth Literature

*3 credits, Lecture. Open to graduate students in English, others with permission.*

#### ENGL 336. Later Eighteenth Century Literature

*3 credits, Lecture. Open to graduate students in English, others with permission.*

**ENGL 337. Romantic Literature**

3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 338. Studies in Victorian Literature**

3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 340. American Literature I**

3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 341. American Literature II**

3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 350. World Literature in English**

Selected works of colonial and post-colonial literature from Africa, South Asia, the Caribbean, Australia, New Zealand, Canada, etc.  
3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 360. Modern British Writers**

3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 365. Irish Literature**

3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 371. Literary Criticism**

A study of the major documents of literary criticism and theory from Plato and Aristotle to the present.  
3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 375. Women and Literature**

Feminist approaches to literature by and about women.  
3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 379. Modern Poetry: Problems in Critical Analysis**

3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 380. Modern Fiction**

3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 383. Non-Fiction Prose**

Study of autobiography, familiar essay, and related genres.  
3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 385. Rhetoric and Composition Theory**

Classical and contemporary rhetorical theory, current research in composition.  
3 credits, Lecture. Open to graduate students in English, others with permission.

**ENGL 389. Modern Drama**

3 credits, Lecture. Open to graduate students in English, others with permission.

**†GRAD 395. Master's Thesis Research**

1 - 9 credits.

**†GRAD 396. Full-Time Master's Research**

3 credits.

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

3 credits.

**GRAD 398. Special Readings (Master's)**

Non-credit.

**GRAD 399. Thesis Preparation**

Non-credit.

**ENGL 400. Independent Study**

A reading course normally open only to doctoral candidates.  
1 - 6 credits, Independent Study. Instructor consent required.

**ENGL 406. Seminar in Beowulf**

3 credits, Seminar. Open to graduate students in English and Medieval Studies, others with permission.

**ENGL 408. Seminar in the English Language**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 415. Seminar in Medieval Literature**

3 credits, Seminar. Open to graduate students in English and Medieval Studies, others with permission.

**ENGL 423. Seminar in Renaissance Literature**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 426. Seminar in Seventeenth-Century Literature**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 430. Seminar in Shakespeare**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 432. Seminar in Eighteenth-Century Literature**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 435. Seminar in Romantic Literature**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 436. Seminar in Victorian Literature**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 440. Seminar in American Literature**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 471. Seminar in Literary Theory**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 475. Seminar in Women and Literature**

3 credits, Seminar. Open to graduate students in English and Medieval Studies, others with permission.

**ENGL 479. Seminar in Modern Poetry**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 480. Seminar in Modern Fiction**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 483. Seminar in Non-Fiction Prose**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 484. Creative Writing Workshop**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 485. Seminar in Rhetoric and Composition Theory**

3 credits, Seminar. Open to graduate students in English, others with permission.

**ENGL 496. Seminar in Major Authors**

3 credits, Seminar. Open to graduate students in English and Medieval Studies, others with permission.

**ENGL 497. Special Topics in Language and Literature**

3 credits, Seminar. Open to graduate students in English and Medieval Studies, others with permission.

**†GRAD 495. Doctoral Dissertation Research**

1 - 9 credits.

**†GRAD 496. Full-Time Doctoral Research**

3 credits.

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

3 credits.

**GRAD 498. Special Readings (Doctoral)**

Non-credit.

**GRAD 499. Dissertation Preparation**

Non-credit.



## ENVIRONMENTAL ENGINEERING

*Program Director:* Professor Dani Or

*Professors:* Bagtzoglou, Bryers, Cetegen, Cutlip, Fenton, Hoag, Robbins, and Torgersen

*Associate Professors:* Abboud, Erkey, Helble, Noll, Ogden, Schulthess, Smets, Vinopal, Wood, and X. Yang

*Assistant Professors:* Anagnostou, Holmén, MacKay, and Wang

*Adjunct Professors:* Grasso and Nikolaidis

*Adjunct Associate Professor:* Curtis

Environmental Engineering is an interdisciplinary field concerned with the scientific and technological aspects of environmentally related processes and systems. Environmental engineers play a critical role in assessing the impacts of existing contamination problems, devising strategies for managing polluted ecosystems, developing new guidelines for the treatment and disposal of wastes, and modifying manufacturing and other activities to minimize the generation of pollutants. Environmental engineers apply scientific principles to these areas in order to improve environmental quality, to protect public health, and to promote the advancement of sustainable development.

The Environmental Engineering graduate program emphasizes the mastery of fundamental scientific and socioeconomic principles. Graduate education in Environmental Engineering provides students with a sound foundation in basic engineering concepts, and the technological training and research expertise necessary to apply these concepts to the solution of a variety of problems.

Environmental Engineering degree programs are offered as an interdisciplinary Field of Study through the School of Engineering. Because of Environmental Engineering's broad scope and association with other University departments and research institutes, it offers a wide range of academic focus areas based in the natural and engineering sciences. Active research areas include:

- biochemical and physiochemical processes in environmental systems,
- combustion and air pollution,
- environmental geophysical techniques,
- environmental interfacial processes,
- groundwater modeling and remediation,
- vadose zone hydrology,
- surface hydrological processes and land atmosphere interactions,
- pollution prevention, and
- environmental biotechnology

The graduate program offers Master of Science and Doctor of Philosophy degrees in Environmental Engineering. Student plans of study are flexible, comprehensive in nature, and are designed to meet the needs of the individual student.

**Admission to Degree Programs.** In addition to the basic admission requirements of the Graduate

School, applicants must submit Graduate Record Examination scores with their application. Sound undergraduate preparation in science and/or engineering is required for entrance to the degree programs. Admission is offered on a competitive basis to highly qualified individuals who show promise for distinguished professional and/or academic careers. Limited remedial coursework for non-engineering prospective students is required. For more details, please visit our website at <<http://www.engr.uconn.edu/environ>>.

**The M.S. Program.** There are no special requirements for admission to the master's program beyond those of the Graduate School. Most entering students have an accredited engineering degree or have taken preparative engineering course work. Selection of the Plan A (thesis) or the Plan B (non-thesis) option is made after consultation with the advisory committee. The primary objective of the master's program is to develop the students' understanding of the subject matter either through an emphasis on research (Plan A) or through a comprehensive understanding of a more general character (Plan B).

**The Ph.D. Program.** Admission to the doctoral program is based upon a careful assessment of the student's potential for significant, creative research in Environmental Engineering. There are no special requirements for admission to the doctoral program beyond those of the Graduate School. The student's plan of study is arranged in consultation with an advisory committee. Doctoral students must pass a general examination by the end of the second year of study.

**Facilities.** Students in the Environmental Engineering program have access to numerous state-of-the-art laboratories and facilities through the School of Engineering and associated University departments and institutes. These resources include: the Biotechnology Center, the Center for Biochemical Toxicology, the Center for Environmental Health, the Combustion/Air Pollution Laboratory, the Environmental Research Institute, the Environmental Processes Laboratory, the Geographic Information Systems Institute, the Hydraulics Laboratory, the Institute of Water Resources, the Marine Sciences Institute, the Pollution Prevention Research & Development Center, and the Unit Operations Laboratory.

The Environmental Research Institute (ERI) is the major center coordinating environmental engineering research at the University. ERI's mission is to develop technology-based solutions to existing and emerging environmental concerns – particularly regarding the management of hazardous wastes and the advancement of pollution prevention technologies. In order to accomplish this mission, ERI supports a wide variety of complementary teaching and public service activities. Administered through the School of Engineering, ERI contains well equipped analytical chemistry, environmental chemistry, and engineering laboratories focused on methods development and advanced analyses.

Graduate students within the School of Engineering also have access to a wide range of

computing facilities. A laboratory of Unix-based SUN computers including Sun Series 3 Workstations and Sun SparcStations is available to students in the environmental field. Peripheral hardware includes line and laser printers, image scanners, slide makers and large plotters. The School of Engineering also houses a series of computing laboratories containing IBM PC and Apple Macintosh computers. Large scale computing facilities are available through the University mainframe system consisting of an IBM 3090 with vector processing.

### COURSES OF STUDY

Environmentally relevant courses are offered by a number of departments. In addition, visiting professors and adjunct faculty routinely offer graduate courses in their areas of expertise.

#### ENVE 300. Environmental Engineering Chemistry - I

Quantitative variables governing chemical behavior in environmental systems. Thermodynamics and kinetics of acid/base coordination, precipitation/dissolution, and redox reactions. *3 credits, Lecture. Also offered as CE 390.*

#### ENVE 301. Environmental Engineering Chemistry - II

Environmental organic chemistry: ideal and regular solution thermodynamics; linear free energy relations; estimation of vapor pressure, solubility, and partitioning behavior, abiotic organic compound transformations; chemical fate modeling.. *3 credits, Lecture. Also offered as CE490*

#### ENVE 302. Advanced Environmental Engineering Laboratory

Analysis of water and waste water. Experimental laboratory and plant investigation of water, wastewater and industrial waste treatment processes. *3 credits, Lecture. Also offered as CE 391.*

#### ENVE 303. Advanced Soil Chemistry

Physical chemical characteristics of soil minerals and soil organic matter, and their reactivity with compounds present in the aqueous and vapor phase. Topics include: modern spectroscopic surface analyses, soil organic matter and its interactions with metals, redox reactions, solubility, derivation of ion-exchange equations, and kinetics of soil reactions. *3 credits, Lecture. Also offered as PLSC 378.*

#### ENVE 304. Probabilistic Methods in Engineering Systems

Common probabilistic models used in engineering and physical science design, prediction, and operation problems; derived distributions, multivariate stochastic models, and estimation of model parameters; analysis of data, model

building and hypothesis testing; uncertainty analysis.

*3 credits, Lecture. Also offered as CE 304.*

**ENVE 305. Transportation and Air Quality**

Mobile source emissions models in theory and practice. Regulatory framework. Emissions control technology. Field and laboratory measurement techniques. Roadway dispersion modeling. Current topics in mobile source emissions.

*3 credits, Lecture. Also offered as CE 305.*

**ENVE 306. Biodegradation and Bioremediation**

Biochemical basis of the transformation of key organic and inorganic pollutants; quantitative description of kinetics and thermodynamics of pollutant transformation; impact of physiochemical and ecological factors on biotransformation.

*3 credits, Lecture. Also offered as CE 394.*

**ENVE 310. Environmental Transport Phenomena**

Movement and fate of chemicals: interfacial processes and exchange rates in environmental matrices.

*3 credits, Lecture. Also offered as CE 389.*

**ENVE 311. Environmental Systems Modeling**

Modeling pollutants in natural surface waters. Advective, dispersive, and advective-dispersive systems. Modeling water quality, toxic organic and heavy metals pollution.

*3 credits, Lecture. Also offered as ce 405.*

**ENVE 320. Ground Water Assessment and Remediation**

Quantitative evaluation of field data in assessing nature and extent of groundwater contamination. Subsurface control and remediation. Case studies.

*3 credits, Lecture. Also offered as CE 410.*

**ENVE 321. Environmental Physicochemical Processes**

Reactor dynamics, applications of interfacial phenomena and surface chemistry, processes for separation and destruction of dissolved and particulate contaminants. Scholarly reviews.

*3 credits, Lecture. Prerequisites: CE 389 or ENVE 310, and CE390 or ENVE 300. Also offered as CE 387.*

**ENVE 322. Environmental Biochemical Processes**

Major biochemical reactions; stoichiometric and kinetic description; suspended and attached growth modeling; engineered biotreatment systems for contaminant removal from aqueous, gaseous, and solid streams; process design.

*3 credits, Lecture. Also offered as CE 388.*

**ENVE 323. Contaminant Source Remediation**

Regulatory framework. Soil clean-up criteria. Treatment technologies: soil vapor extraction,

solidification - stabilization, soil washing - chemical extraction, hydrolysis - dehalogenation, thermal processes, bioremediation. Risk analysis.

*3 credits, Lecture. Also offered as CE 411.*

**ENVE 324. Industrial Wastes**

Origin and characteristics of industrial wastes. Engineering methods for solving industrial waste problems.

*3 credits, Lecture. Also offered as CE 392.*

**ENVE 325. Wastewater Engineering for Unsewered Areas**

Management, planning and design criteria. Recycling, water consumption reduction, soil clogging and treatment methods. Pollutational loads and treatability of each pollutant.

*3 credits, Lecture. Also offered as CE 403.*

**ENVE 326. Solid Waste Engineering**

Methods of collection, transport and disposal, design of solid waste treatment, disposal and recycle systems, management, pollution effects, literature research.

*3 credits, Lecture. Also offered as CE 404.*

**ENVE 340. Combustion and Air Pollution Engineering**

Review of thermodynamics and chemical equilibrium. Introduction to chemical kinetics. Studies of combustion processes, including diffusion and premixed flames. Combustion of gases, liquid, and solid phases, with emphasis on pollution minimization from stationary and mobile systems. Air pollution measurement and instrumentation.

*3 credits, Lecture. Also offered as ME 346.*

**ENVE 341. Advanced Combustion**

Review of thermodynamic properties, transport properties, conservation equations of multicomponent reacting gas. Introduction to chemical kinetics. Classification of combustion waves. Deflagrations, detonations and diffusion flames. Ignition phenomena, droplet and spray combustion and some aspects of turbulent combustion.

*3 credits, Lecture. Also offered as ME 351.*

**ENVE 342. Seminar in Combustion Generated Pollution**

A study of the mechanism of production of pollutants such as nitrogen oxides, carbon monoxide, sulphur dioxide, soot and unburned hydrocarbons from power plants such as stationary gas turbines, internal combustion engines, and jet engines. Emphasis will be placed on current research problems and recent advances in combustor designs.

*3 credits, Seminar. Prerequisite: ME 351 or ENVE 341. Also offered as ME 352.*

**ENVE 343. Transport and Transformation of Air Pollutants**

Transport and deposition of gaseous and aerosol

pollutants; chemical formation and reactions of oxidants and acidic compounds.

*3 credits, Lecture. Also offered as CE 408.*

**ENVE 380. Turbulence I**

Homogeneous turbulence and turbulent transport. Probability functions and Fourier analysis, kinematics, isotropic turbulence, local isotropy and experimental results. Diffusion of scalar properties in isotropic turbulence, turbulent shear flow, boundary layers, jets and wakes. Scalar transport in shear flows.

*3 credits, Lecture. Prerequisite: CE 332 or ENVE 382 or ME 305 or ME 313.*

**ENVE 381. Turbulence II**

Homogeneous turbulence and turbulent transport. Probability functions and Fourier analysis, kinematics, isotropic turbulence, local isotropy and experimental results. Diffusion of scalar properties in isotropic turbulence, turbulent shear flow, boundary layers, jets and wakes. Scalar transport in shear flows.

*3 credits, Lecture.*

**ENVE 382. Advanced Fluid Mechanics I**

Dimensional analysis; vector analysis, circulation and vorticity; irrotational motion and velocity potential; two-dimensional flow and stream function; complex variable theory; conformal mapping; airfoils; sources and sinks; free streamline flow; water waves; three-dimensional flow.

*3 credits, Lecture. Also offered as CE 332.*

**ENVE 383. Advanced Fluid Mechanics II**

Turbulent boundary layer. Dimensional analysis. Free shear flows. Flows in pipes and channels. Boundary layers on smooth and rough surfaces.

*3 credits, Lecture. Also offered as CE 334.*

**ENVE 384. Open Channel Hydraulics**

Unsteady, nonuniform flow; energy and momentum concepts; flow control; de St. Venant equations; unsteady flow modeling of channels and natural rivers.

*3 credits, Lecture. Also offered as CE 338.*

**ENVE 385. Hydrometeorology**

Global dynamics of aquatic distribution and circulation. Hydrologic cycle, atmospheric circulation, precipitation, interception, storage, infiltration, overland flow, distributed hydrologic modeling, and stream routing.

*3 credits, Lecture. Also offered as CE 383.*

**ENVE 386. Hydraulic Machinery and Transients**

Pumps and turbines. Surging, water hammer, cavitation, hydraulic machinery for hydroelectric plants, water supply, irrigation, and river navigation.

*3 credits, Lecture. Also offered as CE 384.*

**ENVE 387. Hydraulic Structures**

River regulation and development. Hydroelectric

plants, storage and turbines, canals, locks, and penstocks, dams, regulation of power, flood control, navigation and irrigation.  
3 credits, Lecture. Also offered as CE 385.

**ENVE 388. Groundwater Flow Modeling**

Basics of modeling with Finite Difference and Finite Element Methods. Modeling flow in saturated and unsaturated zones. Model calibration and validation. Parameter estimation. Treatment of heterogeneity. Basic geostatistics. Modeling surface-groundwater interactions. Application to field sites.  
3 credits, Lecture. Prerequisite: CE 410 or ENVE 320. Also offered as CE 406.

**ENVE 389. Ocean Engineering I**

Dynamics of the ocean, including waves, tides and currents; shore processes and protection works; chemical and physical characteristics of seawater; estuarine flushing, mixing and diffusion; sedimentation; engineering applications.  
3 credits, Lecture. Also offered as CE 401.

†GRAD 395. Master's Thesis Research

1 - 9 credits.

†GRAD 396. Full-Time Master's Research

3 credits.

†GRAD 397. Full-Time Directed Studies (Master's Level)

3 credits.

GRAD 398. Special Readings (Master's)

Non-credit.

GRAD 399. Thesis Preparation

Non-credit.

**ENVE 400. Seminar in Environmental Sciences and Engineering**

Extended discussions on presentations contributed by staff, students and outside speakers. A certificate of completion will be issued from the Environmental Engineering Program.  
1 - 4 credits, Seminar. Also offered as CE 400.

†GRAD 495. Doctoral Dissertation Research

1 - 9 credits.

†GRAD 496. Full-Time Doctoral Research

3 credits.

†GRAD 497. Full-Time Directed Studies (Doctoral Level)

3 credits.

GRAD 498. Special Readings (Doctoral)

Non-credit.

GRAD 499. Dissertation Preparation

Non-credit.

## FLUID DYNAMICS

Fluid dynamics is concerned with the engineering aspects of fluid mechanics in the broadest sense. It encompasses fundamental theory of perfect and viscous flows, compressible and heated flows, magnetohydrodynamics and plasma jets, free-surface flows in oceans and natural water courses, laminar and turbulent flows, and the vast number of practical applications which make fluid motions useful.

**The Ph.D. Program.** The student's plan of study is arranged in consultation with his or her advisory committee to develop competence in fluid dynamics. Since it is possible to emphasize theoretical, applied or experimental research, the student must develop a balance within his or her program consonant with his or her stated objectives. The remaining courses should be of an interdisciplinary nature from the departments in geological, biological, and marine sciences, engineering, chemistry, mathematics, physics, and others which the student and the committee feel are pertinent to the student's program.

About half the total credits should be taken in courses oriented toward the engineering aspects of fluid dynamics. The remainder of the program should consist of related courses preferably in two or more supporting areas considered appropriate in the student's objectives. These may include any courses in solid mechanics, including continuum mechanics, elasticity, plasticity, vibrations and structural or soil mechanics; also any courses in thermodynamics, heat transfer, power plants, process dynamics or reaction kinetics. Related courses in electrical engineering could include those in field theory, networks, computer science, and systems. Fundamental studies in chemistry, mathematics, physics, and statistics constitute an important part of the related course work.

This program is the joint responsibility of the Departments of Civil Engineering and Mechanical Engineering. Inquiries concerning the program may be addressed to these departments.

## GEOGRAPHY

*Department Head:* Professor William Berentsen  
*Professors:* E. Cromley, R. Cromley, Halvorson, Hanink, and MacKinnon  
*Associate Professors:* Andrie and Cooke  
*Assistant Professor:* Vias

The Department of Geography offers a program leading to the M.A. and Ph.D. degrees. The master's program provides study of the theory and methods of analysis of human and physical features of the earth's surface. Students take a small number of core courses in research methods and design, and select an area of specialization for the remainder of their course work. Examples of common specializations include geographic information systems (GIS) and computer graphics, environmental management and planning, and urban and regional analysis. Other specializations in areas of the faculty's expertise are possible. Students, working with their advisors, have a good opportunity to select courses which best fit their intellectual interests and professional needs.

Candidates for the M.A. may pursue either Plan A, completion of twenty-four credits of course work (exclusive of any credits earned for GRAD 395, 396, or 397) and a thesis, including its oral defense; or Plan B, completion of thirty credits of course work (exclusive of any credits earned for GRAD 395, 396, or 397), a scholarly research paper, and a comprehensive final examination assessing mastery of the field and the ability to integrate the knowledge acquired. The program of course work for all students consists of two parts: (1) a required core, and (2) elective advanced course work. All students in the program are expected to complete a proseminar and three required courses covering an introduction to GIS, research design, and quantitative methods. The quantitative methods requirement may be fulfilled by completing one of the following: (1) GEOG 342; (2) GEOG 343; or (3) GEOG 242 and either GEOG 381 or GEOG 382. Elective advanced course work is selected from Geography Department offerings in related areas including GIS, regional analysis and policy, physical environmental systems, and urban and social analysis. Students are encouraged to select courses from related disciplines such as Economics, Civil Engineering, Geology, and Natural Resources Management and Engineering.

For Ph.D. students, required course work consists of the methodological core of one course each in GIS, spatial statistics, research design and the development of geographic thought. The substantive core consists of 12 credits in 400's-level Geography courses not including GEOG 415. To ensure adequate preparation for teaching, all students take a one-credit practicum course GEOG 415 with a faculty member who has regular teaching responsibilities in the appropriate area. Finally, the student completes at least six credits of related course work in a cognate area and at least six credits of course work from a related field outside the department.

The dissertation topic is chosen by the student and major advisor, in consultation with the advisory



committee. After the appropriate course work has been completed, a general examination with both written and oral sections is administered. The written section of the examination is given first. The oral section is given no later than two weeks after the conclusion of the written section and only to students who have passed the written portion of the general examination. Doctoral degree students must submit a dissertation proposal for approval.

The Department recommends that applicants for admission to the graduate program have a strong background in Geography or a related discipline. Students must submit GRE scores and international applicants must also supply TOEFL scores.

**Graduate Certificate in Geographic Information Systems.** A graduate certificate program is offered. The Program is designed to provide a focused, specialized education for professionals seeking expertise in the rapidly evolving field of Geographic Information Systems (GIS), which allows automated storage, retrieval, and cartographic/graphic presentation of spatially-based data sets (e.g., land ownership records, land use information, U.S. census data).

Students enrolled in the program are expected to complete successfully both GEOG 301 and GEOG 303, plus two additional courses in Geography or related fields. Both of these additional two courses must be at the graduate (300 or 400) level, with the lone exception of NRME 238, which will be accepted for credit. A student's program may include only one course described as GEOG 325. Upon admission to the program, a student would develop a program of study with the Certificate Program Coordinator. The sequence of courses is important, because graduate courses are available only once each year.

Students wishing to enroll in this certificate program must have a B.A. or B.S. degree from an accredited institution and must be able to demonstrate either a GPA of at least 2.75 or a score of 1000 or higher on the Graduate Record Examination. Students who do not meet these requirements may qualify for the certificate program by completing at least two courses (six credits) acceptable to the faculty of the department with at least a grade of B in each. If a student qualifies for the certificate program through this latter process, the credits earned in the two courses will apply toward completion of the program. The certificate, a document certifying that the student has completed a coordinated set of courses related to Geographic Information Systems, is awarded when a student passes all required courses with grades of B- or higher. Further information can be obtained from the Department of Geography, U-148, Storrs, Connecticut 06269-2148.

**Special Facilities.** The program is supported both by in-house facilities and external contacts. The department maintains a full range of graphics laboratories. These include both research and teaching laboratories equipped with NT workstations, laser printers, plotters, and digitizers as well as regular computer terminals and printers linked to the University's Computer Center and well

equipped microcomputer lab. These facilities are complemented by research and practicum opportunities in a wide range of external agencies with whom collaborative relations have been established by means of the department's experience with internship programs.

## COURSES OF STUDY

### **GEOG 301. Fundamentals of Geographic Information Systems**

An introduction to numerical procedures for the machine compilation of spatial data including methods of data acquisition and the theory and design of GIS storage and retrieval systems.

*1 – 3 credits, Lecture.*

### **GEOG 302. Interactive Cartographics in Geographic Information Systems**

Interactive programming for the display of spatial data and the design of computer generated maps.

*3 credits, Lecture.*

### **GEOG 303. Application Issues in Geographic Information Systems**

The study of operational and management issues in geographic information systems (GIS). Ways in which traditional planning and management theories and techniques can be implemented in GISs are examined. Topics include problems of data exchange standards, implementation of GIS in an institutional setting including benchmarking a GIS, applications of GIS in various fields, social impacts and legal aspects of GIS. Practical work includes analytical exercises using GIS culminating in an application project.

*3 credits, Lecture. Prerequisite: GEOG 301 or GEOG 246.*

### **GEOG 311. Research Design**

A survey of research methods in geography. Topics include spatial sampling, hypothesis construction and testing and geographic modelling.

*3 credits, Seminar.*

### **GEOG 313. Themes in Geographic Thought**

Examination of the historical development of geography since the early nineteenth century. Emphasis on the last century of intellectual developments that have led to the emergence of contemporary geography as a research discipline.

*3 credits, Seminar.*

### **GEOG 315. Internship in Geography**

A fieldwork internship program under the direction and supervision of the geography staff. Students will be placed in agencies or industries where their academic training will be applied. One 8-hour work day per week (or its equivalent) for the host agency during the course of the semester will be necessary for three

academic credits. A written report will be required.

*1 – 6 credits, Practicum. Instructor consent required.*

### **GEOG 325. Special Problems in Geography**

*1 – 6 credits, Independent Study. Instructor consent required.*

### **GEOG 330. Advanced. Fluvial Geomorphology**

Research methods for analyzing fluvial forms and processes. Theoretical discussion of factors controlling open-channel flow, sediment transport, channel morphology, adjustments of rivers to environmental changes and human impacts. River management and restoration strategies. Requires one weekend field trip.

*3 credits, Lecture. Not open to students who have passed GEOG 230.*

### **GEOG 333. Location Analysis**

Issues and approaches in location analysis. Topics include location theory and models, impacts of locational choice, systems analysis, evaluation of service areas, land use allocation, accessibility and locational conflict. Implications for planning and public policy.

*3 credits, Lecture.*

### **GEOG 334. Regional Development and Policy**

A study of theory and practice in regional development and planning. Emphasis on evaluation of regional problems and public policies designed to resolve them, with a primary focus on the United States.

*3 credits, Seminar. Instructor consent required. Not open to students who have passed GEOG 388.*

### **GEOG 337. Economic Geography of Environmental Issues**

Seminar on theory and applications of economic geography to environmental issues. Location theories and spatial interaction models are considered from local to international scales of analysis.

*3 credits, Seminar. Instructor consent required. Not open to students who have passed GEOG 387.*

### **GEOG 342. Spatial Data Analysis**

Univariate statistics focused on the use of spatial statistics, including geostatistics in geographical research. Problems specific to spatial data analysis are addressed.

*3 credits, Seminar. Instructor consent required.*

### **GEOG 343. Spatial Statistics and Modeling**

Advanced study in the methods and practice of multidimensional statistics and spatial modeling.

*3 credits, Seminar. Prerequisite: GEOG 342.*

### **GEOG 350. Fundamental Geographic Concepts for Educators**

Basic geographic concepts critical for effective teaching in the K-12 environment. Development of materials/curricula for the classroom.

*3 credits, Lecture.*

**GEOG 353. Geography of Russia and Eastern Europe**

Integrative study of geographic patterns in Russia, Eastern Europe and Central Asia, including analyses of climate and resources; population, culture, and urbanization; economic development; and political organization in an historical and contemporary framework.  
*3 credits, Lecture.*

**GEOG 354. Contemporary Europe: A Geography**

An introduction to the peoples, countries, and landscapes of Europe (excluding the republics of the former U.S.S.R.). Emphasis on the economic, political, and social forces both maintaining national identities and shaping a united Europe.  
*3 credits, Lecture.*

**GEOG 355. Geography of Latin America**

Advanced integrative study of physical, historical, social, political and economic geography of Latin America. Particular emphasis on patterns, processes and problems of spatial economic change in the region.  
*3 credits, Lecture.*

**GEOG 358. Geography of Africa**

Advanced study of problems of economic, political, social and spatial integration in Africa. Focus on past and contemporary patterns of change (including associated conflicts) examined within the context of the broader global economy.  
*3 credits, Lecture.*

**GEOG 374. Planning and Land Use**

Contrasting approaches to planning, with an emphasis on legal and political issues in communities and organizations.  
*3 credits, Lecture.*

**GEOG 380. Geographical Analysis of Social Issues**

Focus on geographical perspectives toward research on selected social issues, with an emphasis on methods of behavioral analysis and relevant social geographical concepts such as social space, activity spaces and time-space budgets, and diffusion.  
*3 credits, Seminar.*

**GEOG 382. Computer Applications in Spatial Analysis**

An advanced seminar in the design of computer programs for solving problems in spatial analysis. Students receive a thorough knowledge of FORTRAN and related graphic subroutine libraries necessary to implement individual projects.  
*3 credits, Lecture.*

**GEOG 383. Advanced Urban Geography**

Analysis of social and economic patterns within urban areas, with emphasis on individualized

research. The implications for planning are stressed.

*3 credits, Seminar.*

**GEOG 384. Advanced Economic Geography**

Problems involved in analyzing spatial variations of selected economic variables. Emphasis on location theory with view toward integrating geographic viewpoint and economic concepts.  
*3 credits, Seminar.*

**GEOG 385. Advanced Physical Geography**

Problems involving the application of physical processes in our changing environment.  
*3 credits, Seminar.*

**GEOG 386. Environmental Evaluation and Assessment**

Concepts and methods of environmental analysis in contemporary geography. Emphasis on the ecological impact of human activities and on the evaluation and assessment of existing and future environments.  
*3 credits, Seminar.*

**GEOG 387. Seminar in Environmental Restoration**

Research issues relating to restoration of natural environments including rivers, wetlands, coastal areas, grasslands and forests. Theoretical discussions of restoration ecology, as well as applied discussions of management and engineering concerns. History of environmental restoration; relevant policy debates; specific case studies of river, wetland, coastal, grassland, and forest restoration.  
*3 credits, Seminar.*

**†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

**†GRAD 396. Full-Time Master's Research**

*3 credits.*

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**GEOG 401. Locational Models and Spatial Systems**

Study of the locational models used to examine the arrangement of human and physical systems in space.  
*3 credits, Seminar.*

**GEOG 402. Locational Methods and Spatial Systems**

Study of the locational methods used to examine the arrangement of human and physical systems in space.  
*3 credits, Seminar. Instructor consent required.*

**GEOG 403. Advanced Topics in Spatial Analysis**

*3 credits, Seminar. Instructor consent required.*

**GEOG 404. Advanced Topics in Regional Analysis**

*3 credits, Seminar. Instructor consent required.*

**GEOG 405. Advanced Topics in Population Geography**

*3 credits, Seminar. Instructor consent required.*

**GEOG 406. Advanced Topics in Urban Geography**

*3 credits, Seminar. Instructor consent required.*

**GEOG 407. Advanced Topics in Geography of Public Policy**

*3 credits, Seminar. Instructor consent required.*

**GEOG 408. Advanced Topics in Economic Geography**

*3 credits, Seminar. Instructor consent required.*

**GEOG 408. Advanced Topics in Economic Geography**

*3 credits Seminar. Instructor consent required.*

**GEOG 409. Advanced topics in Physical Geography**

*3 credits, Seminar. Instructor consent required.*

**GEOG 410. Advanced Topics in Environmental Geography**

*3 credits, Seminar. Instructor consent required.*

**†GEOG 415. Practicum in College Teaching in Geography**

Guided development of college-level instruction. Drafting of course objectives, selection of texts, development of course and lecture outlines, selection of grading mechanisms, and incorporating feedback for improvement of instruction.  
*1 credit, Practicum. Instructor consent required. Prerequisite: Graduate status in Geography.*

**†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

**†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

## GEOLOGICAL SCIENCES

*Department Head:* Associate Professor Timothy B. Byrne

*Professors:* Cormier, Gray, Joesten, Philpotts, Robbins, Thorson, Torgersen, and Visscher  
*Associate Professors:* Crespi and Liu

*Adjunct Professor:* McHone

*Adjunct Assistant Professors:* Berner, Jadamec, and Lewis

The Department of Geology and Geophysics offers graduate programs leading to M.S. or Ph.D. degrees in the Geological Sciences.

Programs are designed to provide each student with a broad background in the physical sciences and with the specialization necessary for careers in geology, geophysics, and environmental geoscience.

Research opportunities are available in most of the traditional subdisciplines, including hydrogeology, geochemistry, marine geology, sedimentation, exploration geophysics, geomorphology, glacial geology, structural geology, mineralogy, petrology, seismology, and others.

The Department is fully equipped with analytic and field equipment for research in a wide variety of disciplines.

Graduate research is often supported by the U.S. Environmental Protection Agency, the U.S. Geological Survey, the National Science Foundation, the Connecticut Department of Environmental Protection, and other government agencies. Students also benefit from departmental collaborations with the Environmental Research Institute, the Institute of Water Resources, Marine Sciences Institute, Institute of Materials Science, the Center for Environmental Health, and the Transportation Research Institute, among others. Scientists from outside the department and the University frequently serve on graduate student advisory committees. Most graduate students in residence receive financial support. As Graduate Assistants, they either help support the teaching mission of the Department or assist with faculty research that is supported by external funds.

In addition to applicants with a Bachelor's degree in geology or geophysics, applicants with undergraduate degrees in related disciplines are encouraged to apply, provided that they have a broad undergraduate background in the physical sciences or engineering. Students with degrees in the agricultural sciences, environmental management, and science education also are encouraged to apply. Students with an undergraduate degree in mathematics may wish to apply for admission to pursue study in geophysics.

Students working toward an M.S. degree have the option of following either Plan A (with thesis) or Plan B (non-thesis). Together with their graduate advisory committee, each student develops an individualized plan of study that is tailored to meet their needs and objectives. Students pursuing the Plan B option may do so either full-time or part-time.

**Special Facilities.** Equipment and facilities available in the Department for graduate student research include: fully automated electron microprobe, automated X-ray fluorescence equipment, optical emission and infrared absorption spectrographic instruments, gas chromatograph, single crystal and powder X-ray diffraction equipment, high pressure-high temperature experimental petrology laboratory, sedimentation laboratory, power auger, water-level monitoring gauges, field gas chromatograph, field flame ionization and photoionization detectors, full range of equipment for field water quality sample collection and analysis; geophysical equipment including a three component broadband digital seismograph, magnetometer, gravimeter, refraction seismograph, electrical resistivity unit, terrain conductivity meter, global positioning system, electronic total station, and extensive computing facilities including SUN workstations. The facilities of the Marine Sciences Institute (research vessels, ultra clean analytical chemistry laboratory), the Institute of Materials Science (transmission electron microscope, automated single-crystal x-ray diffractometer), the Environmental Research Institute (Analytical Chemistry Laboratory), and the Computer Applications and Research Center also are available to graduate student research.

### COURSES OF STUDY

#### †GEOL 301. Introduction to Research in the Geological Sciences

Development of speaking skills by oral presentation of short reviews and critiques of journal papers. Development of technical writing skills by preparation of a review paper in the first semester. Preparation and defense of three proposals for thesis research in second semester. Required of all first year graduate students in Geology and in Geophysics.  
*2 credits, Lecture.*

#### GEOL 305. Special Problems in Geology

Advanced study and research in geology.  
*1 – 6 credits, Independent Study. Instructor consent required.*

#### GEOL 308. Phase Equilibria, Kinetics and Transport in Rock Systems

Thermochemical and topological analysis of multicomponent equilibria involving solids and fluids. Quantitative modeling of the crystallization of magmas, kinetics of metamorphic reactions, transport of matter and energy through rocks and deposition of ore minerals.  
*3 credits, Lecture.*

#### GEOL 309. Mathematical Models in Geology

Introduction to the mathematical analysis of geological problems.  
*3 credits, Lecture.*

#### GEOL 312. Applied Geologic Mapping

Advanced surveying and techniques of 3D mapping using electronic total stations, GPS and Geodetic-grade GPS instrumentation. Environmental field geophysics; GPR, resistivity, seismic, magnetic and microgravity surveys. Petrologic, geochemical and geophysical core logging for geotechnical and exploration applications. Field sampling for assay and environmental geochemistry. Detailed geological outcrop mapping. Mine and subsurface geologic mapping.  
*6 credits, Practicum. Instructor consent required.*

#### GEOL 315. Metamorphic Petrology

Interpretation of mineralogical, chemical, and textural features of metamorphic rocks in terms of the physical conditions and dynamic processes operating in the Earth's crust. Thermodynamic description of phase equilibria in fluid-rock systems. Kinetics, mass and energy transport in metamorphic processes. Petrographic and x-ray analytical techniques. (successor to GEOL 336)  
*3 credits, Lecture.*

#### GEOL 317. Advanced Structural Geology

Application of finite and incremental strain analyses using advanced geometric techniques. This course integrates field studies of deformed rocks with theoretical understanding and quantitative analysis.  
*3 credits, Lecture.*

#### GEOL 318. Topics in Sedimentation and Diagenesis

*3 credits, Lecture. Instructor consent required.*

#### GEOL 322. Mineralogical Applications of Crystal Chemistry

Bond theory, crystal structural prediction, properties of materials, phase equilibria prediction, element distribution and related topics.  
*3 credits, Lecture.*

#### GEOL 326. Modern Methods of Geological Analyses I

Principles, capabilities, and limitations of some of the modern methods of field and laboratory investigation in the solution of geological problems.  
*1 – 3 credits, Lecture.*

#### GEOL 327. Modern Methods of Geological Analyses II

Principles, capabilities, and limitations of some of the modern methods of field and laboratory investigation in the solution of geological problems.  
*1 – 3 credits, Lecture.*

#### GEOL 330. Regional Structural Geology

Analysis and interpretation of classic areas of crustal deformation and comparison with regional



structural problems in the U.S.  
3 credits, Lecture.

**GEOL 331. Structural Petrology**

Applications of recent advances in Mineralogy and Petrology to the detailed analysis of rock deformation.  
3 credits, Lecture.

**GEOL 334. Nature of Rock Deformation**

Study of the mechanics of continuous rock deformation, emphasizing current theoretical and analytical approaches.  
3 credits, Lecture.

**GEOL 335. Igneous Petrogenesis**

Processes involved in formation of igneous rocks and relation of field and experimental data to the physical properties of magmas, crystal growth, phase equilibria and differentiation.  
3 credits, Lecture.

**GEOL 340. Advanced Sedimentary Petrology**

Topics and emphasis vary from year to year. Mineral composition, texture, and structure of major sedimentary rock types; relation to tectonic elements, provenance, and depositional sites.  
4 credits, Lecture.

**GEOL 344. Environmental Geology**

Application of geology to environmental needs and problems; after problems; includes investigations into the utilization of natural resources for land use planning, development, and management.  
3 credits, Lecture. Instructor consent required.

**GEOL 351. Aqueous Geochemistry**

Application of physical chemistry theory to problems in geochemistry of the earth's surface waters.  
3 credits, Lecture.

**GEOL 352. Seminar in Structural Geology**

Readings and discussion of recent advances in structural geology.  
3 credits, Lecture.

**GEOL 353. Seminar in Tectonics**

Readings and discussions of recent advances in tectonics.  
3 credits, Lecture.

**GEOL 355. Advanced Hydrogeology**

Transport processes in groundwater systems. Mathematical methods in groundwater hydrology. Water quality and resource evaluation.  
3 credits, Lecture.

**GEOL 356. Groundwater Modeling**

Numerical techniques for modeling flow and contaminant transport in groundwater systems. Model design, calibration, visualization,

verification and sensitivity analysis. Application to field sites.  
3 credits, Lecture.

**GEOL 357. Field Problems in Hydrogeology**

Field methods associated with ground water and contamination assessments.  
1 – 6 credits, Lecture.

†**GEOL 360. Seminar on Current Topics in Geology**

1 credit, Seminar.

**GEOL 361. Seminar in Mineralogy**

Readings and discussions of current literature in mineralogy. For graduate and advanced students in Geology or related fields.  
4 credits, Seminar. Instructor consent required.

**GEOL 362. Seminar in Petrology**

Readings and discussions of recent advances in all aspects of metamorphic and igneous petrology.  
3 credits, Seminar. Instructor consent required.

**GEOL 363. Earth Gravity**

Analysis of the earth's gravity field; isostasy; attraction of buried masses; gravity anomalies and their interpretations; instruments.  
3 credits, Lecture.

**GEOL 364. Geomagnetism**

The earth's magnetic field, its origin and variations; induced and remanent magnetization of rocks; paleomagnetism; magnetotelluric measurements; interpretation methods; instruments.  
3 credits, Lecture.

**GEOL 365. Fundamentals of Seismology**

Theory of elasticity applied to wave propagation; equations of motion; reflection and refraction of elastic waves; wave propagation in homogeneous media; surface waves.  
3 credits, Lecture.

**GEOL 368. Marine Geology**

Relationships between physical and chemical processes and the occurrence and distribution of rock types and compositions in the oceanic environment.  
3 credits, Lecture.

**GEOL 369. Seminar in Geophysics**

Readings and discussions of recent advances in geophysics.  
1 – 6 credits, Seminar. Instructor consent required.

**GEOL 370. Advanced Seismology**

Elastic wave propagation in plane layered media; seismogram synthesis by ray parameter integration, ray approximations, and mode

summation; earthquake source representations.  
3 credits, Lecture. Prerequisite: MATH 310 and MATH 311, which may be taken concurrently.

**GEOL 371. Advanced Plate Tectonics**

The course introduces students to techniques used in analyzing plate motions on a sphere, including poles of rotation and instantaneous and finite motions. The course integrates geologic data and analytical techniques with a rigorous understanding of plate motions and provides students with a global understanding and appreciation of the Earth. (successor to GEOL 333)  
3 credits, Lecture.

**GEOL 372. Sediment Transport**

The mechanics of sediment transport with particular emphasis on the processes governing transport in coastal and estuarine areas. Initiation of motion for cohesive and noncohesive materials, bed and suspended load transport, bed forms, sediment-flow interactions modeling considerations.  
3 credits, Lecture.

**GEOL 374. Physics of the Earth**

The composition, structure, and dynamics of the earth's core, mantle, and crust inferred from observations of seismology, geomagnetism, and heat flow.  
3 credits, Lecture.

**GEOL 375. Geophysical Inverse Theory**

Fitting geophysical model parameters to data. Topics include model uniqueness, resolution, and error estimation.  
3 credits, Lecture.

**GEOL 376. Fundamentals of Planetary Science**

Evolution of the solar system, celestial mechanics, tidal friction, internal composition of planets, black-body radiation, planetary atmospheres.  
3 credits, Lecture.

**GEOL 377. Exploring and Engineering Seismology**

Theory of elasticity applied to wave propagation: equations of motion; reflection and refraction of elastic waves; velocity analysis and fundamental petrophysics; and principles of detecting subsurface interfaces and structures.  
3 credits, Laboratory.

**GEOL 378. Applied and Environmental Geophysics**

Potential theory (gravity, static electricity and magnetic fields), electromagnetic coupling, Maxwell's equations; electromagnetic wave propagation; principles of detection of subsurface interface and structures by geophysical methods.  
3 credits, Laboratory. Instructor consent required.

†GRAD 395. Master's Thesis Research  
1 - 9 credits.

†GRAD 396. Full-Time Master's Research  
3 credits.

†GRAD 397. Full-Time Directed Studies  
(Master's Level)  
3 credits.

GRAD 398. Special Readings (Master's)  
Non-credit.

GRAD 399. Thesis Preparation  
Non-credit.

GEOL 400. Special Topics in Geophysics  
1 - 6 credits, Seminar. Instructor consent  
required.

†GRAD 495. Doctoral Dissertation Research  
1 - 9 credits.

†GRAD 496. Full-Time Doctoral Research  
3 credits.

†GRAD 497. Full-Time Directed Studies  
(Doctoral Level)  
3 credits.

GRAD 498. Special Readings (Doctoral)  
Non-credit.

GRAD 499. Dissertation Preparation  
Non-credit.

## HISTORY

*Department Head:* Professor Altina L. Waller  
*Professors:* Asher, Brown, Buckley, Costigliola,  
Davis, Goodwin, Roe, Silvestrini, and Spalding  
*Associate Professors:* Azimi, Benson, Bergmann,  
Blatt, Cygan, Dayton, Dintenfass, Goodheart,  
Gouwens, Langer, Meyer, Olson, Omara-  
Otunnu, and Shoemaker  
*Assistant Professors:* Baldwin, Campbell, Caner,  
Jensen, Nwokeji, Ogbar, Wang, and Watson

The Department of History offers study leading to the degrees of Master of Arts and Doctor of Philosophy. Master's students have flexibility in selecting courses in accordance with their interests and professional goals. Doctoral students may undertake work in four broad areas: medieval European, modern European, United States, and Latin American history. Students also have the opportunity to enroll in related courses offered by other departments.

**Admission to the M.A. Program.** Three letters of recommendation, preferably from members of the academic profession, along with a writing sample and personal statement from the applicant, are required. Graduate Record Examinations scores on the General Tests also are required. Applicants wishing to begin the program in the fall semester must submit their applications and all supporting documents before April 15; applicants for financial aid should submit all materials by January 15. Applicants wishing to begin in the spring semester must submit their applications before November 1. Applicants are expected to have adequate preparation (a minimum of twenty-one credits of history above the freshman level, including courses in both United States and European history), an average of at least B in undergraduate history courses, and preparation in related fields of the social sciences and humanities.

**Departmental Requirements for the Ph.D.** Students who have a master's degree in history, or are working for one, and whose graduate work shows sufficient promise may apply for admission to the doctoral program, submitting a transcript of at least one semester's work at the master's level. All applicants for admission to the doctoral program follow the same procedures for admission as required of an applicant to the master's program. New doctoral students are expected to begin full-time study during the year for which they are admitted.

Students pursuing the doctorate with an area of concentration in medieval or modern European history must demonstrate their reading competence in two European languages. Students in United States and Latin American history as well as those emphasizing modern British history must demonstrate reading competence in at least one foreign language. Additional competency may be required by the major advisor, depending on the student's research area.

Applicants admitted with a master's degree are expected to submit evidence of proficiency in at

least one foreign language early in their first semester of work. The entire language requirement must be completed before a student takes the general examination.

A doctoral student in history must complete a minimum of one year of full-time study in residence beyond the master's degree, consisting of two consecutive semesters of a full-time graduate program (i.e., 24 credits of course work or the equivalent) at the Storrs campus. A graduate assistant, whose academic program proceeds at half the rate of the full-time student, fulfills the residence requirement with two years of such service.

Other requirements, particularly regarding the areas for the general examination, are described in the pamphlet, Graduate Programs in History, which may be obtained from the Department.

**Special Facilities.** The Homer Babbidge Library has in the past few years greatly expanded its materials in United States, Latin American, and European history. The Dodd Center, which houses the Archives and Special Collections Department of the Babbidge Library as well as the Oral History Center, has extensive holdings. These include the Hispanic History and Culture Collections (with Spanish and Latin American newspapers, and a unique Puerto Rican collection); the Alternate Press Collection, and the Nuremberg Trial papers (within the Thomas J. Dodd papers). The Department also has access to the library and facilities of the Munson Institute for Maritime History at Mystic Seaport. In addition to these resources, several major libraries and archives within a one-hundred-mile radius of the University are accessible for research purposes.

**Web Site and E-mail.** *Web page*—[www.history.uconn.edu](http://www.history.uconn.edu); *e-mail*—[histadm1@uconnvm.uconn.edu](mailto:histadm1@uconnvm.uconn.edu).

### COURSES OF STUDY

**HIST 300. Independent Study in History**  
1 - 6 credits, *Independent Study*.

†**HIST 301. Independent Reading Course**  
This course is designed for the doctoral student who has completed the equivalent of at least one semester of full-time study to meet the residence requirement.  
3 credits, *Independent Study*.

**HIST 302. Special Topics in History**  
3 credits, *Seminar. Instructor consent required.*

**HIST 307. Seminar in the History of Science**  
3 credits, *Seminar*.

**HIST 310. The French Revolution**  
An intensive study of the intellectual, social, economic, political, and military events of the period and of their impact upon the world, as well as upon French history.  
3 credits, *Seminar. Instructor consent required.*

**HIST 311. Nineteenth Century France***3 credits, Seminar.***HIST 315. Topics in Ancient Civilization***3 credits, Seminar. Instructor consent required.***HIST 316. Topics in Medieval History***3 credits, Seminar. Instructor consent required.***HIST 323. State and Society in Europe since 1800**

Relationship between social change and state formation in Western Europe from c. 1800 to the mid-20th century; industrialization, class, social identities, nationalism, and imperialism.

*3 credits, Seminar.***HIST 324. Europe in the Nineteenth and Twentieth Centuries***3 credits, Seminar. Instructor consent required.***HIST 325. Social and Intellectual History of Europe in the Nineteenth and Twentieth Centuries***3 credits, Seminar. Instructor consent required.***HIST 326. Topics in Central European History, 1790-1918***3 credits, Seminar. Instructor consent required.***HIST 327. Topics in Imperialism***3 credits, Seminar. Instructor consent required.***HIST 328. Collaborative Colloquium**

Comparative/collaborative study of topics in different areas and/or periods.

*3 credits, Lecture.***HIST 330. Topics in New England History***3 credits, Seminar. Instructor consent required.***HIST 331. The American Revolution***3 credits, Seminar. Instructor consent required.***HIST 332. American Maritime History**

A study of the development of American mercantile enterprise from colonial times and its relationship to American political, economic, and cultural history. The course includes lectures, readings, and extensive use of the facilities at Mystic Seaport. It is given at Mystic Seaport under the joint auspices of the University of Connecticut and the Frank C. Munson Institute of American Maritime Studies.

*3 credits, Seminar. Instructor consent required.***HIST 333. Topics in the History of American Women***3 credits, Seminar. Instructor consent required.***HIST 334. Topics in Colonial American History***3 credits, Seminar. Instructor consent required.***HIST 335. Society and Culture in the Civil War Era, 1830-1880**

The social, economic, political and cultural forces, including gender, race, and class, that

shaped the Civil War and its aftermath.

*3 credits, Seminar. Instructor consent required.***HIST 336. Topics in the History of Urban America***3 credits, Seminar. Instructor consent required.***HIST 337. Topics in American Social and Cultural History, 1600-1876**

Major themes in the recent scholarship of social and cultural history: community and communication; family and gender; race, class, and industrialization; religion; and slavery.

*3 credits, Seminar. Instructor consent required.***HIST 338. United States in the Early National Period and the Age of Jackson, 1787-1840***3 credits, Seminar. Instructor consent required.***HIST 339. Topics in Black History***3 credits, Seminar. Instructor consent required.***HIST 340. Introduction to Historical Museum Work I**

A study of historical agencies and museums. Laboratory work and field trips are included.

*3 credits, Lecture. Instructor consent required.***HIST 341. Introduction to Historical Museum Work II**

A study of historical agencies and museums. Laboratory work and field trips are included.

*3 credits, Lecture.***HIST 342. Theories of History**

The principles and problems underlying the study of history; and a survey of the history of historical writing and of various schools of historical interpretation.

*3 credits, Seminar. Instructor consent required.***HIST 345. Topics in American Family History***3 credits, Seminar. Instructor consent required.***HIST 347. United States in the Age of Reform, 1877-1924***3 credits, Seminar. Instructor consent required.***HIST 348. The United States from the 1920s to the 1960s***3 credits, Seminar. Instructor consent required.***HIST 349. Topics in the History of American Foreign Relations***3 credits, Seminar. Instructor consent required.***HIST 351. Topics in Russian History***3 credits, Seminar. Instructor consent required.***HIST 356. Germany in the Nineteenth and Twentieth Centuries***3 credits, Seminar. Instructor consent required.***HIST 361. England from 1066 to 1307***3 credits, Lecture. Instructor consent required.***HIST 362. Topics in Modern British History***3 credits, Seminar. Instructor consent required.***HIST 366. Topics in Italian History***3 credits, Seminar. Instructor consent required.***HIST 370. Western Europe in the Fifteenth and Sixteenth Centuries***3 credits, Seminar. Instructor consent required.***HIST 373. Europe in the Seventeenth Century***3 credits, Lecture. Instructor consent required.***HIST 374. Europe in the Eighteenth Century***3 credits, Seminar. Instructor consent required.***HIST 375. Topics in Nineteenth Century European Diplomacy***3 credits, Seminar. Instructor consent required.***HIST 376. War and Revolution in the Twentieth Century***3 credits, Lecture. Instructor consent required.***HIST 381. Topics in Latin American History***3 credits, Seminar. Instructor consent required.***HIST 382. The Historical Literature of Latin America***3 credits, Seminar. Instructor consent required.***HIST 386. Topics in Twentieth-Century China***3 credits, Lecture. Instructor consent required.***HIST 387. East Asian History**

Topics in modern Chinese and Japanese history with emphasis on Chinese thought and politics.

*3 credits, Lecture. Instructor consent required.***HIST 390. Seminar in American Maritime Studies**

A seminar involving reading and research on selected topics in American maritime studies. Open only to students who have previously taken History 332 or to advanced students who are concurrently enrolled in History 332. This course is given at Mystic Seaport under joint auspices of the University of Connecticut and the Frank C. Munson Institute of American Maritime History.

*3 credits, Seminar. Instructor consent required.***HIST 391. Administration of Archives and Manuscripts**

An overview of the history and development of the American archival profession, including basic archival theory and methodology. Emphasizes principles of collection, organization, and reference service for historical manuscripts and archives.

*3 credits, Seminar.***HIST 392. Advanced Practice in Archival Management**

Advanced practice in archival management, such as appraisal, records management, access, and



public programs. Application of archival principles through specific projects relating to processing, appraisal, public outreach, and reference service.

*3 credits, Seminar. Instructor consent required. Prerequisite: HIST 391.*

†GRAD 395. **Master's Thesis Research**  
*1 - 9 credits.*

†GRAD 396. **Full-Time Master's Research**  
*3 credits.*

†GRAD 397. **Full-Time Directed Studies (Master's Level)**  
*3 credits.*

GRAD 398. **Special Readings (Master's)**  
*Non-credit.*

GRAD 399. **Thesis Preparation**  
*Non-credit.*

†HIST 400. **Investigation of Special Topics**  
*1 - 6 credits, Independent Study.*

**HIST 401. Introduction to Historical Research**  
Introduction to the sources and methods of professional historians. Finding primary sources (qualitative and quantitative), evaluating them for accuracy and usefulness, organizing data, and writing exercises based on the sources. Students must produce a proposal (fully annotated) for a major research paper to be written in the subsequent semester.  
*3 credits, Seminar. Instructor consent required.*

**HIST 402. Historical Research and Writing**  
A research seminar for students in the M.A. and Ph.D. programs in history.  
*3 credits, Independent Study. Instructor consent required.*

**HIST 420. Research Seminar in Medieval History**  
*3 credits, Seminar. Instructor consent required.*

†GRAD 495. **Doctoral Dissertation Research**  
*1 - 9 credits.*

†GRAD 496. **Full-Time Doctoral Research**  
*3 credits.*

†GRAD 497. **Full-Time Directed Studies (Doctoral Level)**  
*3 credits.*

GRAD 498. **Special Readings (Doctoral)**  
*Non-credit.*

GRAD 499. **Dissertation Preparation**  
*Non-credit.*

## HUMAN DEVELOPMENT AND FAMILY STUDIES

*Dean:* Professor Charles M. Super

*Professors:* Anderson, Blank, Harkness, O'Neil, Rigazio-DiGilio, Ryder, and Sabatelli,

*Associate Professors:* Arms, Brown, Garey, Goldman, Harwood, Mulroy, Sheehan, and Wisensale

*Assistant Professors:* Asencio, Britner, Descartes, Gibson, and Strong

Graduate courses and research opportunities are offered leading to the Master of Arts degree and Doctor of Philosophy degree in Human Development and Family Studies. Available study areas include, but are not restricted to, gerontology, childhood, life span development, family interaction, and marital and family therapy. Courses are offered in early childhood, adolescence, gerontology, life span development, psychosocial and cognitive development, marital and family interaction, family life education, and marriage and family therapy.

Students studying marital and family therapy are required to complete clinical practicums in the Center for Marriage and Family Therapy and in selected mental health and family therapy agencies. Such study is designed to fulfill the academic requirements needed to achieve Connecticut licensure and clinical membership in the American Association for Marriage and Family Therapy, which requires twelve continuous months of practicum placement. Students studying marital and family therapy at the doctoral level must have completed the necessary Master's level prerequisites before taking advanced course work and fulfilling the required 9-12 month internship in an approved agency.

Students' individual programs of study can be developed in conjunction with faculties in related areas and may include offerings from departments and schools throughout the University. Graduate students are encouraged to elect supervised fieldwork and research projects in nearby community agencies.

**Admission to the M.A. Program.** It is desirable for applicants to have a fundamental background in the social sciences and a basic understanding of research procedures. Application forms should be obtained from and be returned directly to the Graduate Admissions Office. In addition, applicants must present results of the General Test of the Graduate Record Examinations and at least three letters of recommendation. The letters should be sent directly to the Coordinator of Admissions, Family Studies Graduate Program, Unit 2058, Storrs, Connecticut 06269-2058. Applicants must submit their applications and all supporting documents by January 15. Students ordinarily are admitted to the program to start classes in the fall semester.

**Admission to the Ph.D. Program.** A prospective student must hold a bachelor's or master's degree from a college or university of approved standing. Applicants must show promise of superior achievement in research.

It is desirable, but not mandatory, that the applicant's previous work include undergraduate or graduate study in the areas of Human Development and Family Studies or related behavioral and social science.

The General Test of the Graduate Record Examinations and the Miller Analogies Test are required. Request for waiver of either must be made in writing when submitting application materials. Application forms and instructions for applying may be obtained from the Graduate Admissions Office. Applications and transcripts are to be submitted to that office, while letters supporting the application, and all routine communications, are to be addressed to the Coordinator of Admissions, Family Studies Graduate Programs, Unit 2058, Storrs, Connecticut 06269-2058.

Complete applications and all supporting documents must be received no later than January 15. Students ordinarily are admitted to the program to start classes in the fall semester.

**Special Facilities.** Applied activities of the Family Studies program are housed in the Human Development Center. The Center affords observation and video taping facilities in its laboratories and therapy and testing rooms. The Center for Marital and Family Therapy (CMFT) is a training facility for graduate intern therapists enrolled in the Master's Program for Marriage and Family Therapy in the School of Family Studies. The Center offers a range of therapeutic services which are available to university faculty, staff and their families, undergraduate or graduate students, and any individual or family living in the greater Northeastern Connecticut area. These services include individual therapy, family therapy, marital or relationship therapy, and therapy for parenting or child-related problems. The Center also offers seminars for mental health professionals, family life enrichment programs, and support/therapy groups. Consultation services and on-site training are available to other departments within the University, as well as to outside community agencies.

The Child Development Laboratories (CDL), which are part of the School of Family Studies, offer full-day and half-day programs for children from six weeks to six years of age. The CDL's mission is to train students who will be working with young children, facilitate research in child development, and serve as a model center for providing quality programs for young children. Besides serving as a research and training site for faculty and students in Human Development and Family Studies, the laboratories provide facilities for observation, research, student projects, and field placements for other departments.

The University Computer Center is a further resource available to students.

The School of Family Studies houses the Center on Aging and Human Development. Gerontology educational programs, research and service activities are coordinated through the Center.

Through the School of Family Studies, a certificate program in Gerontology is offered. The 12 credit certificate program is open to students in master's or doctoral programs in a wide range of

academic disciplines, as well as in the School of Family Studies. In addition, professionals working in the field of aging who have satisfactorily completed an undergraduate degree program may apply.

The Center offers a limited number of Fellowships to pursue gerontological research. Fellowships are awarded on a competitive basis and are open to full-time graduate students in all departments and programs.

## COURSES OF STUDY

### **HDFS 300. Independent Study in Human Development and Family Relations**

Advanced study for qualified students who present suitable projects for intensive, independent investigation in human development and family relations.

*1 – 6 credits, Independent Study. Instructor consent required.*

### **HDFS 301. Seminar**

Seminar in professional orientation to the field of human development and family relations.

*1 credit, Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 302. Special Topics in Human Development and Family Studies**

In-depth investigation of a recent issue of human development and family studies.

*1 – 3 credits, Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 303. Research Methods in Human Development and Family Studies I**

Family and human development procedures, research experience related to analyzing interpersonal interaction and developmental processes.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 304. Qualitative Research Methods in HDFS**

Philosophical bases of qualitative research in the social sciences; developing qualitative strategies; including: existential-phenomenological, intensive interviews, participant observation, and textual analysis.

*3 credits, Seminar. Instructor consent required. Open to graduate students in Human Development and Family Studies, others with permission. Prerequisite: HDFS 303.*

### **HDFS 305. Research Methods in Human Development and Family Studies II**

Advanced family and human development research methods; research design and underlying methodological issues in analyzing

interpersonal interaction and developmental processes.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 306. Research Practicum**

Supervised research in Family Studies.

*1 – 6 credits, Practicum. Instructor consent required.*

### **HDFS 308. Practicum in University Teaching of Human Development and Family Studies**

Supervised teaching of undergraduate courses in Human Development and Family Studies.

*3 credits, Practicum. Instructor consent required.*

### **HDFS 315. Models and Concepts of Lifespan Human Development**

Overview of approaches to understanding human development across the lifespan. Emphasis on models that cross disciplinary boundaries to explore development in social and cultural contexts.

*3 credits, Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 320. Programs for Young Children**

Day care, preschool, and related programs for young children and their families; developmental theory in these programs, conceptual models and approaches, and evaluation issues.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 325. Gender Role Issues for Helping Professionals**

Intensive review of gender role socialization in a workshop setting, emphasizing men's and women's gender role conflicts across the life span. Lectures, readings, discussions, self assessments, and media are used to explicate core concepts and themes.

*3 credits, Lecture.*

### **HDFS 330. Current Topics in Early Childhood Education**

In-depth investigation of a current issue in early childhood education (e.g., emergent literacy, diversity), with focus on recent research and application to classroom practice. Includes classroom observation and laboratory observation.

*1 – 6 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 331. Prevention, Intervention, and Public Policy**

Survey course of the theory, practice and science of primary prevention of human problems. Prevention concepts and case studies are presented. Students give analysis and critique of course content and develop personal

and professional perspectives on prevention practice and possible social policy initiatives.

*3 credits, Seminar.*

### **HDFS 335. Administration and Leadership in Early Childhood Programs**

Critical issues in early childhood program administration, leadership, ethics, management, and advocacy.

*3 credits, Seminar. Instructor consent required.*

### **HDFS 340. Aging: Personality and Social Interaction**

Patterns of adjustment to aging; continuity versus change in personality, role changes, and family relations of the elderly.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 341. Aging: Physiological, Cognitive and Perceptual Changes**

Psychophysiological changes in old age; psychobiological theories of aging, age changes in cognition, perception and learning, and impact of physical health on performance.

*3 credits, Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 342. Aging in the Family**

Theory, research and social issues affecting older families, developmental changes within aging families which impact on patterns of social interaction and support.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 344. Housing for the Elderly**

Housing types, adaptive accommodations, and emerging patterns of choice occurring in American society during middle-age and late adulthood; effects of economic and social changes as related to decision making by individuals about private and public living arrangements; design of research and evaluation methodology.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

### **HDFS 345. Public Policy and Programs for the Elderly**

Existing programs at Federal, State, and Community levels as currently deployed under various Titles of the Older Americans Act, Social Security, Medicare, and Medicaid; program objectives, scope, costs, and levels of delivery as they relate to identified needs of present and future groups of the elderly; use of policy-determining data and program evaluation methodologies.

*3 credits, Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 347. Social Gerontology**

Societal aspects of aging, including the social psychological concomitants of adjustments, changing roles, and systems of social relationships.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 348. Adaptation and Development in Adulthood**

Young adulthood through middle-age with particular attention on transition episodes; stability and change in adult personality with attention to familial and other social relationships.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 351. Foundations of Marriage and Family Therapy**

Theoretical foundations of marriage and family therapy; basic principles of therapy, interactional patterns of marital dyads and families under stress; professional and ethical issues relevant to the practice of marriage and family therapy.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 354. Marriage Therapy**

Marital interaction and therapy. Theory and technique of contemporary therapeutic approaches.

*3 credits, Seminar. Open to graduate students in Human Development and Family Studies, others with permission. Prerequisite: HDFS 351.*

**HDFS 356. Family Therapy**

Contemporary clinical conceptualizations of family interaction, major contributions to the development of family therapy as a unique discipline. Issues and problems commonly confronted in conducting family therapy.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission. Prerequisite: HDFS 351 which can be taken concurrently.*

**HDFS 359. Case Seminar in Marriage and Family Therapy**

Specialized professional issues and professional problems in the practice of marriage and family therapy. Case material.

*3 credits, Seminar. Instructor consent required. Prerequisites: HDFS 351 and either HDFS 354 or HDFS 356. HDFS 362 should be taken concurrently.*

**HDFS 361. Introduction to Clinical Practice and Professional Issues**

Clinical practice in the Center for Marital and Family Therapy and in approved clinical training centers. Classwork and supervised clinical practice required. Professionalism, ethics,

confidentiality, therapeutic techniques, and procedures required for clinical practice.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission. Prerequisite: HDFS 351 which can be taken concurrently.*

**HDFS 362. Practicum in Marriage and Family Therapy**

Supervised group experience in marriage and family therapy related to clinical practice in the Center for Marital and Family Therapy or other approved clinical training centers.

*1 – 6 credits, Practicum. Instructor consent required. Open to graduate students in Human Development and Family Studies, others with permission. Prerequisites: HDFS 361 and either HDFS 354 or HDFS 356.*

**HDFS 363. Individual Supervision in Marriage and Family Therapy**

*1 – 6 credits, Independent Study. Instructor consent required. Open to graduate students in Human Development and Family Studies, others with permission. Prerequisites: HDFS 361 and either HDFS 354 or HDFS 356.*

**HDFS 364. Clinical Assessment and Practice**

Diagnosis and treatment of dysfunctional marital and family relationship patterns, nervous and mental disorders; major family therapy assessment methods and instruments.

*3 credits, Seminar. Instructor consent required.*

**HDFS 365. Human Development and Family Studies Over the Life Span**

Individual and family development; family interaction, reciprocity and change in social role behaviors and attitudes of family members over the life span.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 369. Gender Role Transitions and Conflicts Over the Lifespan**

The identification and study of men's and women's gender role transitions and conflicts over the lifespan using psychosocial theory. Developmental stages and tasks are critically analyzed using psychological, sociological, multicultural, and gender role theories and research.

*3 credits, Lecture.*

**HDFS 377. Human Sexuality**

Human sexual behavior and attitudes.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 380. Special Issues in Family Development**

Theory, research and practice applied to special issues in human development and family relations over the life span.

*3 credits, Lecture. Open to graduate students in*

*Human Development and Family Studies, others with permission.*

**HDFS 381. Cultural Issues in Child Development**

An examination of the cognitive, social, and emotional development of children from a cultural perspective. Emphasis placed on infancy, socialization, theories of cognitive development, and schooling.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 382. Universals in Human Behavior**

Evidence regarding cross cultural universals in human behavior: culture, social and emotional behavior, cognitive behavior and development, language and language acquisition.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 383. Seminar on Parent-Child Relations in Cross-Cultural Perspective**

Research and theory regarding the antecedents and effects of major dimensions of parental behavior on child development in the U.S.A. and cross-culturally, parental warmth, control, punishment, and their interactions.

*3 credits, Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 384. Advanced Seminar in Theories of Human Development**

Theoretical positions influencing the field of human development and empirical evaluation of these positions.

*3 credits, Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 385. Seminar in Advanced Child Development**

Development of the child within the family setting.

*3 credits, Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 386. Seminar on Adolescent Development**

Adolescent development; understanding the various forces related to adolescent behavior.

*3 credits, Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 387. Parent Education**

Planning, implementation, and evaluation of parent education programs for individuals and groups. Development and use of materials for such programs.

*3 credits, Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*



**HDFS 388. Supervised Field Work in Family Development**

Work in a community agency related to the field of family development.

1 – 6 credits, *Clinical. Instructor consent required.*

**HDFS 390. Theories and World Views Informing Marriage and Family Therapy**

Underlying theories and conceptualizations informing marriage and family therapy.

3 credits, *Lecture. Instructor consent required.*

**HDFS 391. Patterns and Dynamics of Family Interaction**

Readings and research concerning the family, stressing interpersonal processes and communication.

3 credits, *Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 393. Close Relationships**

Formation, maintenance, and dissolution of close relationships across the life span; relationships like courtship, marriage, parent-child, and friendships.

3 credits, *Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 394. Methods and Materials of Family Life Education**

Recent research, publications, films, programs, and teaching techniques in the field of family development and counseling with families.

3 credits, *Lecture. Open to graduate students in Human Development and Family Studies, others with permission.*

**HDFS 395. Theories of Family Development**

Concepts and theories in the area of family development.

3 credits, *Seminar. Open to graduate students in Human Development and Family Studies, others with permission.*

**†GRAD 395. Master's Thesis Research**

1 - 9 credits.

**†GRAD 396. Full-Time Master's Research**

3 credits.

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

3 credits.

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**HDFS 410. Family Therapy Research**

Family therapy research methods; research design and methodological issues in analyzing treatment interventions, family interaction processes, and change.

3 credits, *Lecture. Open to graduate students in Human Development and Family Studies, others with permission. Prerequisite: HDFS 303.*

**HDFS 420. Family Therapy Supervision**

Major models and methods of marriage and family therapy supervision; ethical and legal responsibilities faced by marital and family therapy supervisors. Development of perceptual, conceptual, and executive skills needed to supervise and train practitioners in the field of marriage and family therapy.

3 credits, *Seminar. Instructor consent required.*

**HDFS 430. Advanced Family Therapy**

Current trends and issues in the field of family therapy; integration of clinical theory, research, and practice.

3 credits, *Seminar. Instructor consent required. Prerequisite: HDFS 351 and HDFS 356.*

**HDFS 495. Internship in Marital and Family Therapy**

Nine to twelve month period of full-time clinical experience in a cooperating institution. Open only with consent of instructor to students of advanced standing in marital and family therapy. Offered at approved clinical training centers. The student assumes a full range of professional responsibilities associated with practice of marital and family therapy. Minimum of 500 hours of direct client contact and receipt of 100 hours of supervision.

1 – 6 credits, *Clinical. Instructor consent required.*

**†GRAD 495. Doctoral Dissertation Research**

1 - 9 credits.

**†GRAD 496. Full-Time Doctoral Research**

3 credits.

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

3 credits.

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

## INTERNATIONAL STUDIES

*Executive Director:* Professor Boris E. Bravo-Ureta  
*Associate Executive Director:* Associate Professor Elizabeth Mahan

*Emiliana Pasca Noether Professor of Italian History:* Professor John Davis

*UNESCO Chair for Human Rights:* Associate Professor Amii Omara-Otunnu

*Professors:* P. Allen, Aschkenazy, Bellingham, Benson, Berentsen, Berthelot, Boster, Bowman, Bravo-Ureta, Buckley, Costigliola, Creevey, Dewar, Goodwin, Gordon, Gugler, Handwerker, Hanson, Healy, López, Masciandaro, Orringer, Reagan, Schensul, Sheckley, Silander, Silvestrini, Spalding, Talvacchia, Vengroff, and Zirakzadeh

*Associate Professors:* Bergmann, Boyer, Celestin, Chazdon, Chinchilla, Cosgel, Coundouriotis, Dalmolin, Erickson, Gomes, Gouwens, Guénoun, Kimenyi, Langer, Leach, Lefebvre, Mahan, McBrearty, McNeece, Randolph, Sazama, Snyder, Sterling-Folker, and Von Hammerstein

*Assistant Professors:* Bouchard, Caner, Gaztambide-Geigel, Greeley, Kingstone, Larson, Liu, Loss, Martinez, Melehy Nwokeji, Pantoja, Pardo, Phillips, Schiwy, Scruggs, Seda Ramirez, Travis, Watson, and Weidauer

*Adjunct Assistant Professors:* Carrasquillo and Rekrut

Study is offered leading to the degree of Master of Arts in the field of International Studies. Students may pursue a general program emphasis or pursue one of four areas of concentration: African Studies, European Studies, Italian History and Culture, or Latin American Studies. Offered also is a dual program which combines the master's degree in International Studies with the Master of Business Administration degree.

**The M.A. in International Studies.** The master's degree program is available in two plans: Plan A requires a minimum of 21 credits of course work plus a thesis; Plan B requires 30 credits of course work plus a comprehensive exam. Course work must be distributed over three academic disciplines. Students are required to demonstrate proficiency in appropriate languages adequate both for conversation and research. Scores from the General Test of the Graduate Record Examination and two letters of recommendation are required for admission. As each program (African Studies, European Studies, Italian History and Culture, Latin American Studies, and the general program) has additional guidelines regarding required and elective courses, language proficiency, and comprehensive examinations, to fully understand program requirements students must contact area studies Centers or the Office of International Affairs.

Information concerning the African Studies concentration may be obtained from Professor Josef Gugler, Director, Center for Contemporary African Studies (Unit 2068). Information concerning the European Studies and Italian History and Culture

concentrations may be obtained from Professor John Davis, Director, Center for European Studies (Unit 1182). Information regarding the Latin American concentration may be obtained from Associate Professor Elizabeth Mahan, Director of the Center for Latin American and Caribbean Studies (Unit 1161). Information concerning other areas of emphasis may be obtained from the Associate Executive Director of the Office of International Affairs (Unit 1182).

#### **M.A. in International Studies and M.B.A.**

The dual M.A. & M.B.A. degree program consists of 72 credits of course work distributed between International Studies and Business Administration. The M.B.A. portion of the program consists of 42 credits in business, plus fifteen credits of electives. The M.A. portion of the program comprises 30 credits of course work, of which 15 credits count as electives in the M.B.A. portion.

The M.A. program is available in two plans: Plan A requires a minimum of 21 credits of course work, plus a nine credit thesis; Plan B requires 30 credits of course work, plus a comprehensive examination. M.A. students must also demonstrate language proficiency sufficient for conversation and to conduct research in an appropriate second language. Students in the M.A. program select either an area of concentration or an interdisciplinary field of study as the focus of their work.

When completing the application form, applicants to the joint M.A. in International Studies and M.B.A. must indicate clearly as Degree Sought that pursuit of the "Dual M.A. in International Studies and M.B.A. Program" is intended. Applicants are expected to provide three letters of recommendation and scores from both the Graduate Management Admissions Test (GMAT) and from the General Test of the Graduate Record Examinations (GRE).

For information about the M.B.A. program, students should write to the Director of the M.B.A. Program, School of Business Administration (Unit 1041-041MBA).

**Special Facilities.** The Centers for Contemporary African Studies, European Studies, and Latin American and Caribbean Studies encourage and promote programs and multidisciplinary research in their respective areas.

Concerning the study of Latin America, library resources are especially strong for the study of Mexico, the Southern Cone, and the Caribbean. The Thomas J. Dodd Research Center has a number of special collections that are particularly strong in relation to the area studies programs. The Latin American Survey Data Bank in the Roper Center for Public Opinion Research maintains and acquires historical and current national-level surveys from throughout the region.

The Latin American Studies programs at the University of Connecticut, Brown University, the University of Massachusetts, Amherst, and Yale University constitute the Latin American Studies Consortium of New England. Consortium partners arrange occasional faculty exchanges. Students in all four programs may use the libraries of other

Consortium members without charge, and may attend classes at the other universities.

The Center for European Studies coordinates small funded exchanges of graduate students between the University of Connecticut and German universities.

## **COURSES OF STUDY**

### **African**

#### **AFRI 300. Independent Study**

*1 - 9 credits, Independent Study. Instructor consent required.*

#### **AFRI 301. Seminar in African Studies**

Interdisciplinary introduction to graduate level study of Africa.  
*3 credits, Seminar.*

#### **AFRI 305. Special Topics in African Studies**

*1 - 9 credits, Seminar.*

### **European**

#### **ES 300. Independent Study in European Studies**

*1 - 6 credits, Independent Study. Instructor consent required.*

### **Latin American**

#### **LAMS 300. Special Topics**

*1 - 6 credits, Independent Study. Instructor consent required.*

#### **LAMS 360. Seminar on Latin American Business**

Latin American business practices and operations. U.S. and transnational business in Latin America.  
*3 credits, Lecture.*

#### **LAMS 370. Latin American Popular Culture**

Culture, subcultures, and culture industries in Latin America. Conditions which affect the mass production, dissemination and reception of entertainment products. Reading knowledge of Portuguese or Spanish required.  
*3 credits, Seminar.*

#### **LAMS 380. Latin American Studies Project**

Independent, interdisciplinary research project culminating in a written paper, developed by the student under the supervision of a committee consisting of a first and second reader. The first reader will be the major advisor on the project. This course is intended to be the capstone course for the master's degree, to be taken after all other course requirements are completed.  
*3 credits, Independent Study. Instructor consent required.*

**LAMS 390. Seminar in Latin American Studies**  
Interdisciplinary introduction to graduate level study of Latin America.

*3 credits, Seminar.*

### **All Areas**

#### **†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

#### **†GRAD 396. Full-Time Master's Research**

*3 credits.*

#### **†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

#### **GRAD 398. Special Readings (Master's)**

*Non-credit.*

#### **GRAD 399. Thesis Preparation**

*Non-credit.*

## JUDAIC STUDIES

*Field of Study Coordinator:* Professor Arnold Dashefsky

*Professors:* Aschkenasy and Tec

*Associate Professor:* S. Miller

*Assistant Professor:* S. Johnson

*Adjunct Professors:* Freund, Kassow, and Lang

Interdisciplinary work leading to the degree of Master of Arts in Judaic Studies is offered by the Departments of History, Modern and Classical Languages, and Sociology. This degree is administered by the Center for Judaic Studies and Contemporary Jewish Life, which is housed in the Thomas J. Dodd Research Center. Since the program in Judaic Studies is intended to provide a synthesis of broad areas of Jewish culture and thought as a basis for constructive research in specialized aspects of Jewish civilization, students normally are required to include in their programs courses offered by the supporting departments.

**Admission to the Degree Program.** The Judaic Studies Admissions Committee considers applications for admission to the master's program. An undergraduate major in the area is not necessarily required, but, before admission, students must show evidence of adequate preparation.

**The M.A. Program.** Work leading to the degree of Master of Arts in Judaic Studies may be undertaken either with Plan A (with thesis) or Plan B (without thesis). In either case, course work in Judaic Studies is to be distributed among several departments, and the student's advisory committee is composed of representatives of these departments. The M.A. degree is offered in consortial relationship with the University of Hartford and draws on faculty from neighboring colleges and universities.

**Courses of Study.** Course offerings and faculty are listed under Judaic Studies and Hebrew as well as the cooperating and supporting departments referred to above: History, Modern and Classical Languages and Sociology. The Committee for Judaic Studies organizes a number of colloquia featuring staff members and visiting lecturers and encourages graduate students to attend. Two years of college-level Hebrew language instruction (or its equivalent) is required in order to receive the Master's degree.

**Support.** Stipends are available through the Center for Judaic Studies and Contemporary Jewish Life.

### COURSES OF STUDY

#### JUDS 301. Hebrew Wisdom Literature

Systematic examination of classical wisdom texts in the Hebrew Bible and Rabbinic Literature focusing on their contribution to world ethical literature. Taught in English.

*3 credits, Seminar.*

#### JUDS 303. Religion of Ancient Israel

Significant aspects of the religion of ancient Israel: The God-human relationship, the origins of good and evil, law and covenant, kingship, prophecy, ritual and morality, repentance and redemption. Taught in English.

*3 credits, Lecture.*

#### JUDS 311. History and Literature of Talmudic Palestine

A discussion of select topics and texts pertaining to religious, social, and political currents in Talmudic Palestine. Taught in English.

*3 credits, Seminar.*

#### JUDS 325. Seminar on the Holocaust: Philosophical and Historical Issues

Study of philosophical and historical issues related to the occurrence and analysis of the Holocaust.

*3 credits, Seminar. Prerequisite: at least 6 credits of Judaic Studies graduate courses.*

#### JUDS 343. Seminar on American Jewry

Applications of sociological theory and methods to the analysis of American Jewry.

*3 credits, Seminar.*

#### JUDS 351. Seminar on Modern Jewish Philosophy

Study of the principal issues and figures in Jewish philosophy from the Enlightenment to the present. Topics considered include the nature (and possibility) of Jewish philosophy, the concepts of God, nature, and the world, the status of religious knowledge, law and practice, the concept of election in relation to the people and land of Israel. Thinkers to be considered and read include Moses Mendelssohn, Solomon Maimon, S.R. Hirsch, Hermann Cohen, Franz Rosenzweig, Ahad Ha'am, Martin Buber, Emanuel Levinas, A.J. Heschel, and Joseph Soloveitchik.

*3 credits, Seminar. Prerequisite: at least 6 credits of Judaic Studies graduate courses.*

#### JUDS 390. Independent Study

*3 credits, Independent Study. Instructor consent required.*

#### JUDS 397. Special Topics in Judaic Studies

*3 credits, Seminar. Instructor consent required.*

#### †GRAD 395. Master's Thesis Research

*1 - 9 credits.*

#### †GRAD 396. Full-Time Master's Research

*3 credits.*

#### †GRAD 397. Full-Time Directed Studies (Master's Level)

*3 credits.*

#### GRAD 398. Special Readings (Master's)

*Non-credit.*

#### GRAD 399. Thesis Preparation

*Non-credit.*

## LINGUISTICS

*Department Head:* Professor Diane Lillo-Martin

*Professor:* van der Hulst

*Associate Professors:* Calabrese and Snyder

*Assistant Professors:* Beck, Boskovic, and Sharvit

The Department of Linguistics offers study leading to the degrees of Master of Arts and Doctor of Philosophy, emphasizing theoretical research in syntax, semantics and phonology and experimental research in child language acquisition.

**Admission Requirements.** All applicants must submit a sample research paper (such as a thesis or term paper) written in English. It is strongly recommended that this paper be on a topic in linguistics. This research paper and three letters of recommendation are to be sent directly to the Department of Linguistics.

Application forms for admission may be obtained by writing to the Department of Linguistics or the Graduate Admissions Office.

Suitable undergraduate major fields include linguistics, cognitive science, computer science, languages, mathematics, philosophy, and psychology. Applicants are required, however, to have completed some prior course work in formal generative grammar.

**Special Facilities.** Resources for experimental research in child language acquisition include the excellent facilities at the University's Child Development Laboratories, as well as the Department's own Psycholinguistics Laboratory. Federal research grants to faculty members, and a long-standing association with Haskins Laboratories in New Haven, Connecticut, also provide significant research opportunities for doctoral students.

### COURSES OF STUDY

#### LING 300. Survey of Modern Linguistic Theory

The fundamental ideas of linguistics. For advanced students in other disciplines.

*3 credits, Lecture.*

#### LING 301. Formal Foundations for Linguistic Theory

The bases of formal models of syntax and semantics. Languages as sets of sentences; the Chomsky hierarchy of language types; truth; quantification; Logical Form.

*3 credits, Seminar. Open to graduate students in Linguistics, others with permission.*

#### LING 304. Investigation of Special Topics

*1 - 6 credits, Independent Study. Instructor consent required.*

#### LING 305. Research Seminar in Language and Psychology

*1 credit, Seminar. Open to graduate students in Linguistics, others with permission. Also offered as PSYC 305.*



**LING 306. Field Methods in Linguistics**

Collection and analysis of linguistic data from native consultants.  
3 credits, Seminar. Prerequisites: LING 308, LING 314, and LING 321.

**LING 308. Phonology I**

The analysis of sound patterns in languages within a generative framework: distinctive features, segmental and prosodic analysis, word formation, the theory of markedness.  
3 credits, Seminar. Open to graduate students in Linguistics, others with permission.

**LING 309. Phonology II**

The analysis of sound patterns in languages within a generative framework: distinctive features, segmental and prosodic analysis, word formation, the theory of markedness.  
3 credits, Seminar. Prerequisite: LING 308.

**LING 310. Experimental Phonetics I**

Physiology and acoustics of speech production; speech perception; analysis and synthesis of speech; experimental approaches to issues in phonology.  
3 credits, Seminar. Open to graduate students in Linguistics, others with permission.

**LING 311. Experimental Phonetics II**

Physiology and acoustics of speech production; speech perception; analysis and synthesis of speech; experimental approaches to issues in phonology.  
3 credits, Seminar. Prerequisite: LING 310.

**LING 312. Problems in Experimental Phonetics**

Analysis and synthesis of speech with reference to acoustic and articulatory correlates of distinctive features.  
3 credits, Seminar. Prerequisite: LING 311.

**LING 314. Linguistic Phonetics**

Articulatory and auditory phonetics: comparative analysis of speech sounds in a wide variety of languages; practice in production and perception: transcription.  
3 credits, Seminar. Prerequisite: LING 310.

**LING 315. Problems in Phonology**

Advanced work in phonology.  
3 credits, Seminar. Prerequisite: LING 309.

**LING 321. Syntax I**

Transformational analysis within a Chomskyan framework; deep structure, surface structure, universal conditions on the form and application of transformational rules.  
5 credits, Seminar. Open to graduate students in Linguistics, others with permission.

**LING 322. Syntax II**

Transformational analysis within a Chomskyan framework; deep structure, surface structure,

universal conditions on the form and application of transformational rules.

3 credits, Seminar. Prerequisite: LING 321.

**LING 323. The Acquisition of Syntax**

Relationship between the syntax of children's language and linguistic theory.  
3 credits, Seminar. Prerequisite: LING 321.

**LING 324. Readings and Research in Syntax**

Examination and discussion of classic articles in syntactic theory; presentation of ongoing student research.  
3 credits, Seminar. Prerequisite: LING 322.

**LING 325. Problems in Syntax**

Advanced work in syntax.  
3 credits, Seminar. Prerequisite: LING 322.

**LING 327. Comparative Syntax**

Cross-linguistic study of syntactic structure; implications for linguistic theory.  
3 credits, Seminar. Prerequisite: LING 322.

**LING 330. Language Contact**

Study of linguistic systems from the data of languages in contact: acquisition, bilingualism, interference.  
3 credits, Seminar. Prerequisites: LING 308 and LING 321.

**LING 332. Methods in Acquisition**

Experimental methods for first language acquisition research.  
3 credits, Seminar. Prerequisite: LING 323.

**LING 333. Readings and Research in Acquisition**

Lectures and discussion of classic and current articles in first language acquisition; presentation of ongoing student research.  
3 credits, Seminar. Prerequisite: LING 323.

**LING 334. Topics in Acquisition**

Current topics in first language acquisition research.  
3 credits, Seminar. Prerequisite: LING 323.

**LING 335. Second Language Acquisition**

Current research on theories of second language acquisition. Differences between first and second language development, including views on the availability of universal grammar. Linguistic input and the effect of age of immersion in a second language. Research methodologies and their validity will be discussed. Pedagogical implications derivable from this research will be addressed. Student research component.  
3 credits, Lecture.

**LING 340. Historical Linguistics**

Introduction to the theories and techniques of studying linguistic change. The comparative

method of reconstructing languages. Internal reconstruction. Rule change.

3 credits, Seminar. Prerequisites: LING 309 and LING 322.

**LING 351. Structure of a Selected Language**

Phonological and syntactic problems of a given language.  
3 credits, Seminar. Prerequisites: LING 308 and LING 321.

**LING 360. Seminar in General Linguistics**

Topics in general linguistics at an advanced level.  
3 credits, Seminar. Prerequisites: LING 308 and LING 321.

**LING 361. Reading and Script**

Linguistic and psychological aspects of written language.  
3 credits, Seminar. Open to graduate students in Linguistics, others with permission.

**LING 370. Semantics**

Theories of meaning and reference. Formal treatment of meaning in a generative grammar.  
3 credits, Seminar. Prerequisite: LING 301.

**LING 371. Psychological Models for Syntax and Semantics**

Psychological reality of syntactic and semantic structures. Models of sentence production, sentence perception, and comprehension.  
3 credits, Seminar. Open to graduate students in Linguistics, others with permission.

**LING 372. Topics in Semantics**

Current topics in semantic research.  
3 credits, Seminar. Prerequisite: LING 370.

**LING 373. Semantics Seminar**

Classical and recent literature and current research in semantics.  
3 credits, Seminar. Prerequisite: LING 370.

**†GRAD 395. Master's Thesis Research**

1 - 9 credits.

**†GRAD 396. Full-Time Master's Research**

3 credits.

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

3 credits.

**GRAD 398. Special Readings (Master's)**

Non-credit.

**GRAD 399. Thesis Preparation**

Non-credit.

**LING 405. Theories of Language**

Theories about the nature of language from the beginnings of linguistic science to the present.  
3 credits, Seminar. Prerequisites: LING 309 and LING 322.

**LING 410. Studies in Experimental Phonetics**  
Reports and critical discussion of selected topics in the literature.  
*3 credits, Seminar. Prerequisites: LING 309 and LING 311.*

†**GRAD 495. Doctoral Dissertation Research**  
*1 - 9 credits.*

†**GRAD 496. Full-Time Doctoral Research**  
*3 credits.*

†**GRAD 497. Full-Time Directed Studies (Doctoral Level)**  
*3 credits.*

**GRAD 498. Special Readings (Doctoral)**  
*Non-credit.*

**GRAD 499. Dissertation Preparation**  
*Non-credit.*

## MARINE SCIENCES

*Department Head:* Professor James O'Donnell  
*Professors:* Bohlen, Cooper, Fitzgerald, Kremer, Monahan, Torgersen, and Whitlatch  
*Associate Professors:* Dam, McManus, and Visscher  
*Assistant Professors:* Bogden, Codiga, Lin, Skoog, and Ward

The Department of Marine Sciences offers study and research programs leading to the degrees of Master of Science and Doctor of Philosophy in the field of oceanography. Areas of special interest include biological, chemical, geological and physical oceanography and marine geophysics.

Because of the varied training of students and the interdisciplinary nature of marine sciences, plans of graduate study are flexible and broad in scope, and are designed to meet the needs of the individual student. The department offers several courses which are used as a core curriculum in the study of marine sciences, in addition to an array of other offerings in specific areas of the field.

**Master of Science.** For admission, a bachelor's degree in a related science normally is required and there are no special requirements for admission beyond those of the Graduate School. Selection of a Plan A (thesis) or Plan B (course work) degree normally is made after consultation with the student's advisory committee. Since the faculty conduct laboratory and field research programs, most students complete a research project.

**Doctor of Philosophy.** Students entering the doctoral program normally have a master's degree in a related science. Specific course requirements for the Ph.D. degree in oceanography are established by the student's advisory committee. Depending upon the student's committee, a foreign language or a related area of study (e.g., statistics, computer science) outside the student's major program emphasis is required. Upon passing the written portion of the general examination, the student takes an oral examination, which covers the field of oceanography.

The Department also actively participates in several interdisciplinary academic programs at the M.S. and Ph.D. level:

*Biological Sciences.* Certain members of the faculty also are members of the Department of Ecology and Evolutionary Biology. Work in marine ecology, botany, and evolution is available.

*Geological Sciences.* M.S. and Ph.D. level programs associated with the Department of Geology and Geophysics are available. Appointments of several Department faculty allow work in marine geophysics, geology and sedimentology.

**Special Facilities and Educational Opportunities.** The Department maintains laboratories in Groton, Connecticut. Research vessels, an ultra-clean analytical chemistry laboratory and seawater facilities are available through the Marine Sciences and Technology Center. Additional facilities are provided by

biological sciences, Sea Grant, geology/geophysics, the National Undersea Research Center, the Coast Guard Research and Development Center, and the Sea Research Foundation.

### COURSES OF STUDY

#### **MARN 325. Radiotracer Applications in Natural Systems**

Applications of radiotracers in the environment for environmental engineers, environmental scientists, geologists, hydrologists and oceanographers. Use of radionuclides in the interpretation and quantification of aqueous transport processes. The interaction of geochemistry, mass transport and flux balances in Earth, ocean and environmental systems.  
*3 credits, Lecture. Instructor consent required.*

#### **MARN 331. Marine Phytoplankton Ecology and Physiology**

The physiology of marine phytoplankton, environmental factors affecting their growth and photosynthesis in the ocean, the oceanographic processes responsible for the temporal and spatial distributions of phytoplankton biomass and production, and current topics in phytoplankton research.

*3 credits, Lecture.*

#### **MARN 332. Marine Zooplankton**

The role of bioenergetics, life history, population and community dynamics and their role in biogeochemical cycles of protozoan and metazoan marine zooplankton.

*3 credits, Lecture. Instructor consent required. Prerequisite: EEB 244 or EEB 245 or MARN 380.*

#### **MARN 336. Biogenic Fluxes in the Oceans**

Processes regulating the export of organic matter from the surface of the ocean to the sea bed. New and export production; role of the biotic and abiotic processes in downward transport of particulate and dissolved organic matter; current topics of research on the biological pump.

*3 credits, Lecture. Instructor consent required. Prerequisite: MARN 380.*

#### **MARN 351. Aqueous Geochemistry**

Application of chemical theory to rock-water interaction and the geochemistry of the Earth's aqueous systems.

*3 credits, Lecture.*

#### **MARN 365. Molecular Approach to Biological Oceanography**

Principles and technology in nucleic acid purification and manipulation, DNA fingerprinting, gene cloning and sequencing, phylogenetic analysis, and detection of gene expression (mRNA and protein). Application examples in marine ecological studies.

*3 credits, Lecture.*

**MARN 368. Marine Geology**

Relationships between physical and chemical processes and the occurrences and distribution of rock types and compositions in the oceanic environment.

3 credits, Lecture.

**MARN 370. Dynamic Physical Oceanography**

Global energy balance. General circulation in the oceans and atmosphere. Thermodynamics and stability. Fundamental fluid mechanics. Surface gravity waves. Geophysical fluid mechanics. Tides and other long waves. Theories of global circulation.

3 credits, Lecture.

**MARN 371. Chemical Oceanography**

The role of the oceans in the major global biogeochemical cycles of carbon, sulfur, nutrients, gases and trace elements. Studies include reaction rates, chemical speciation, equilibria, solubility, oxidation-reduction, absorption, complexation and their effects on the composition of sea water and the transfer of substances at the Earth's surface.

3 credits, Lecture.

**MARN 372. Sediment Transport**

The mechanics of sediment transport with particular emphasis on the processes governing transport in coastal and estuarine areas. Initiation of motion for cohesive and noncohesive materials, bed and suspended load transport, bed forms, sediment-flow interactions, modeling considerations.

3 credits, Lecture.

**MARN 376. Estuarine Circulation**

The physical characteristics of estuaries, river and tidal interactions, turbulence and mixing, salt balance, circulation dynamics, mass transport and flushing, modeling considerations.

3 credits, Lecture. Prerequisite: MARN 370.

**MARN 377. Ocean Waves**

General methods of wave analysis; surface gravity waves; tidal wave dynamics; internal waves and tides; planetary, edge and topographic Rossby waves.

3 credits, Lecture. Prerequisite: MARN 370.

**MARN 378. Advanced Dynamical Oceanography**

Ocean thermodynamics; dynamics of rotating; homogeneous fluids; ocean circulation; western boundary currents; the thermocline, oceanic fronts.

3 credits, Lecture. Instructor consent required. Prerequisite: MARN 370.

**MARN 379. Seminar in Chemical Oceanography**

Readings and discussions of current literature in chemical oceanography. For graduate and advanced students in oceanography or related fields.

3 credits, Lecture. Instructor consent required.

**MARN 380. Biological Oceanography**

An advanced course in biological processes in oceanic and coastal waters. Emphasis is on empirical and theoretical concepts of marine ecosystem dynamics, primary and secondary production and detrital cycling.

3 credits, Lecture.

**MARN 382. Coastal Pollution and Bioremediation**

Overview of processes and compounds leading to pollution in the nearshore marine environment. The impact of pollution on the marine foodweb and its response is emphasized. Alleviation of pollution through metabolism of organisms, including bacteria, seagrasses and salt marshes.

3 credits, Lecture.

**MARN 385. Marine and Atmospheric Processes of Global Change**

Fundamentals of marine and atmospheric processes in global biogeochemistry. Evaluation of atmospheric, biological and chemical processes that contribute to global change.

3 credits, Lecture.

**MARN 386. Marine Bioorganic Chemistry**

Overview of the molecular basis of metabolic and bioenergetic pathways and processes with emphasis on life in the marine environment. Synthesis of marine natural products. Laboratory demonstrations of selected molecular and physiological techniques used in oceanography.

3 credits, Lecture.

**MARN 390. Mathematical Models in Marine Sciences**

Examples of the formulation of quantitative models of marine systems with a review of some particularly useful mathematical methods (differential equations, operational methods, numerical solution techniques), emphasizing the computation of predictions.

2 credits, Lecture. Prerequisite: 9 graduate credits in Marine Science.

**MARN 391. Mathematical Models in Marine Sciences: Practicum**

Individual term projects relating to mathematical modeling in the marine sciences.

2 credits, Practicum.

**MARN 395. Independent Study**

A reading course for those wishing to pursue special work in marine sciences. It may also be elected by undergraduate students preparing to be candidates for degrees with distinction. Designate the field of special interest by use of the appropriate section symbol.

1 credit, Independent Study. Instructor consent required.

**MARN 397. Research**

Conferences and laboratory work covering selected fields of marine sciences.

1 - 3 credits, Independent Study. Instructor consent required.

**†GRAD 395. Master's Thesis Research**

1 - 9 credits.

**†GRAD 396. Full-Time Master's Research**

3 credits.

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

3 credits.

**GRAD 398. Special Readings (Master's)**

Non-credit.

**GRAD 399. Thesis Preparation**

Non-credit.

**MARN 410. Special Topics in Marine Sciences**

1 - 6 credits, Lecture. Instructor consent required.

**MARN 441. Ecology of Marine Invertebrates**

Functional responses of organisms to abiotic factors in the marine environment (light, temperature, salinity, oxygen tension, intertidal exposure).

3 credits, Lecture. Instructor consent required.

**MARN 443. Marine Systems Ecology**

Effects of biotic and abiotic parameters on the structure and function of marine ecosystems. Techniques for the analysis of energetics, nutrient cycles, and trophic characteristics in both theoretical and applied problems. Field trips are required.

4 credits, Lecture.

**†GRAD 495. Doctoral Dissertation Research**

1 - 9 credits.

**†GRAD 496. Full-Time Doctoral Research**

3 credits.

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

3 credits.

**GRAD 498. Special Readings (Doctoral)**

Non-credit.

**GRAD 499. Dissertation Preparation**

Non-credit.



## MATERIALS SCIENCE

*Director:* Professor Harris L. Marcus

*Associate Director:* Associate Professor Fotios Papadimitrakopoulos

*Distinguished Professor:* Brody

*Professors:* Best, Braswell, Budnick, Coughlin, Cutlip, Galligan, Goldberg, Greene, Hines, Huang, Jain, Kattamis, Kessel, Knox, Marcus, Makriyannis, Morral, Pease, Peterson, M. Shaw, Stwalley, Suib, Sung, Tanaka, and Weiss

*Associate Professors:* Aindow, Padture, Papadimitrakopoulos, Seery, and L. Shaw

*Assistant Professors:* Mather, Sotzing, Utz, Wei, and Zhu

*Research Professors:* Boggs, Gell, and Scola

*Adjunct Professors:* Ambrosio, Chapoy, and Han

Work leading to the degrees of Master of Science and Doctor of Philosophy is offered in the interdisciplinary field of materials science through the Departments of Chemical Engineering, Chemistry, Electrical Engineering, Geology and Geophysics, Metallurgy and Materials Engineering, and Physics, as well as departments in the biological sciences. Additional study and research programs in biomaterials are offered by the Departments of BioStructure and Function; and Biomedical Services.

**The M.S. Program.** There are no special requirements for admission to the master's program beyond those of the Graduate School. Selection of Plan A (thesis) or Plan B (non-thesis) is made after consultation with the advisory committee.

**The Ph.D. Program.** Admission to the doctoral program is based upon a careful assessment of the student's potential for creative research in materials science. There are no special requirements for the doctoral program beyond those of the Graduate School.

**Special Facilities.** The Institute of Materials Science, organized in 1965, aids in the development and coordination of the graduate programs in materials science. In addition to the laboratories of the participating academic departments, the Institute provides special laboratories for adhesion research, alloy chemistry, optical studies, color-center studies, magnetic susceptibility, electron paramagnetic resonance, nuclear magnetic resonance, ion implantation, microprobe analyses, electron microscopy, crystal growth, mechanical properties, optical microscopy, metallography, solidification, chromatography, low-temperature studies, X-ray diffraction, soft X-ray spectroscopy, surface studies, surface modification, ultrasonics, IR, UV, and VUV spectroscopy, and polymer research. A multi-million-dollar building houses these and additional laboratories and facilities designed for graduate research in the materials sciences.

Extensive capability for computational materials science is available within the Institute of Materials Science and other University facilities.

Areas of concentration within the Materials Science field of study are offered in Alloy Science, Biomaterials, Corrosion Science, Crystal Science, Dental Materials, Metallurgy, and Polymer Science.

## COURSES OF STUDY

Course offerings are listed under the departments referred to above. The Institute of Materials Science also sponsors visiting professors and adjunct professors from industry in these departments, who usually offer graduate courses in their areas of expertise. In addition, the Institute sponsors a colloquium series of outstanding speakers representing various study areas in materials science not specifically covered by the regular faculty.

## MATHEMATICS

*Department Head:* Professor Charles Vinsonhaler

*Professors:* Abe, Abikoff, R.F. Bass, Blei, Choi, Giambalvo, Gine, Glaz, Grochenig, Haas, Hansell, Hurley, Koltracht, Lerman, Madych, McKenna, Neumann, Sidney, D. Spencer, Spiegel, Tollefson, Vadiveloo, and W. Wickless

*Associate Professors:* Cornell, Hernandez, Leibowitz, Olshevsky, and Wang

*Assistant Professors:* Gordina, X. Li, and Teplyaev

The Department of Mathematics offers work leading to the M.S. and Ph.D. degrees. The master's program permits a student to emphasize pure and applied mathematics, actuarial science, or numerical methods, with some course work taken in other departments if desired. Advanced study at the Ph.D. level is offered in the areas of algebra, applied mathematics, classical and functional analysis, differential geometry, logic, and topology. See the details below.

The Department is one of the few offering graduate study in actuarial science. Admission requirements differ slightly for this option. For details, write to the Department of Mathematics.

**The M.S. Program.** A sound undergraduate major in mathematics, including courses in modern algebra and advanced calculus, normally is required for entrance to the master's program. The Department recommends that students select Plan B. Further details concerning the master's (and Ph.D.) program may be obtained by writing directly to the Department of Mathematics.

It is recommended that entering graduate students applying for financial aid take the Subject Test in Mathematics of the Graduate Record Examinations.

**The Ph.D. Program.** Students are admitted to the Ph.D. program only after demonstrating ability and evidence of special aptitude for research in mathematics in their prior work. Although no specified number of course credits is required for the Ph.D., usually at least 24 credits of course work beyond the master's level is considered necessary. Students must satisfy the doctoral foreign language requirement of the Graduate School. Doctoral students also are expected to possess computer skills necessary for mathematics research. During the first two to three years of the student's course work, comprehensive examinations covering the major areas of mathematics must be passed. The Ph.D. dissertation contains results of original research in mathematics and makes a substantial contribution to the field. A student normally writes a dissertation in an area in which the Department has faculty actively engaged in research. Such areas are: Fourier analysis, harmonic analysis, complex analysis, Riemann surfaces, general topology, algebraic topology, topological measure theory, probability theory, low dimensional topology, partially ordered sets, abelian groups, rings, group rings, discrete groups, Lie algebras, functional analysis, representation theory, logic, computability theory, ordinary and partial differential equations,

numerical analysis, approximation theory, differential geometry, numerical linear algebra and matrix theory, inverse problems, tomography, wavelet theory, mathematical physics, and actuarial science. Further details concerning the Ph.D. (and Master's) program and faculty research interests may be obtained by writing directly to the Department of Mathematics or by visiting the website: <www.math.uconn.edu>.

**Special Facilities.** The Homer Babbidge Library has extensive holdings of mathematics books and journals. Subscriptions to numerous mathematical journals are maintained and housed in the Mathematics Department Library.

A weekly colloquium featuring visiting lecturers is conducted during the academic year. Colloquia and seminars at neighboring institutions are also held on a regular basis. Because of the easy access to these institutions, there is considerable scholarly interaction.

## COURSES OF STUDY

### **MATH 300. Investigation of Special Topics**

Students who have well defined mathematical problems worthy of investigation and advanced reading should submit to the department a semester work plan.

*1 – 6 credits, Lecture. Instructor consent required.*

### **MATH 301. Introduction to Modern Analysis**

Metric spaces, sequences and series, continuity, differentiation, the Riemann-Stieltjes integral, functions of several variables.

*3 credits, Lecture.*

### **MATH 303. Measure and Integration**

Lebesgue measure and integration, differentiation, Lp spaces. Banach spaces, general theory of measure and integration.

*3 credits, Lecture. Prerequisite: MATH 301.*

### **MATH 304. Mathematical Modeling**

Development of mathematical models emphasizing linear algebra, differential equations, graph theory and probability. In-depth study of the model to derive information about phenomena in applied work.

*3 credits, Lecture. Instructor consent required.*

### **MATH 305. Computerized Modeling in Science**

Development and computer-assisted analysis of mathematical models in chemistry, physics, and engineering. Topics include chemical equilibrium, reaction rates, particle scattering, vibrating systems, least squares analysis, quantum chemistry and physics.

*4 credits, Lecture. Instructor consent required.*

### **MATH 307. Introduction to Geometry and Topology I**

Topological spaces, connectedness, compactness, separation axioms, Tychonoff theorem, compact-open topology, fundamental group, covering spaces, simplicial complexes,

differentiable manifolds, homology theory and the De Rham theory, intrinsic Riemannian geometry of surfaces.

*3 credits, Lecture. Prerequisite: MATH 301, which may be taken concurrently.*

### **MATH 308. Introduction to Geometry and Topology II**

Topological spaces, connectedness, compactness, separation axioms, Tychonoff theorem, compact-open topology, fundamental group, covering spaces, simplicial complexes, differentiable manifolds, homology theory and the De Rham theory, intrinsic Riemannian geometry of surfaces.

*3 credits, Lecture. Prerequisite: Math 307.*

### **MATH 309. Advanced Financial Mathematics**

An introduction to the standard models of modern financial mathematics including martingales, the binomial asset pricing model, Brownian motion, stochastic integrals, stochastic differential equations, continuous time financial models, completeness of the financial market, the Black-Scholes formula, the fundamental theorem of finance, American options, and term structure models.

*3 credits, Lecture.*

### **MATH 309. Optimization**

Theory of linear programming: convexity, bases, simplex method, dual and integer programming, assignment, transportation, and flow problems. Theory of nonlinear programming: unconstrained local optimization, Lagrange multipliers, Kuhn-Tucker conditions, computational algorithms. Concrete applications.

*3 credits, Lecture.*

### **MATH 310. Introduction to Applied Mathematics I**

Banach spaces, linear operator theory and application to differential equations, nonlinear operators, compact sets on Banach spaces, the adjoint operator on Hilbert space, linear compact operators, Fredholm alternative, fixed point theorems and application to differential equations, spectral theory, distributions.

*3 credits, Lecture.*

### **MATH 311. Introduction to Applied Mathematics II**

Banach spaces, linear operator theory and application to differential equations, nonlinear operators, compact sets on Banach spaces, the adjoint operator on Hilbert space, linear compact operators, Fredholm alternative, fixed point theorems and application to differential equations, spectral theory, distributions.

*3 credits, Lecture.*

### **MATH 313. Numerical Analysis and Approximation Theory I**

The study of convergence, numerical stability, roundoff error, and discretization error arising from the approximation of differential and

integral operators.

*3 credits, Lecture. Prerequisite: MATH 301, which may be taken concurrently.*

### **MATH 314. Numerical Analysis and Approximation Theory II**

The study of convergence, numerical stability, roundoff error, and discretization error arising from the approximation of differential and integral operators.

*3 credits, Lecture. Prerequisite: MATH 313.*

### **MATH 315. Abstract Algebra I**

A study of the fundamental concepts of modern algebra: groups, rings, fields. Also selected topics in linear algebra.

*3 credits, Lecture.*

### **MATH 316. Abstract Algebra II**

A study of the fundamental concepts of modern algebra: groups, rings, fields. Also selected topics in linear algebra.

*3 credits, Lecture. Prerequisite: MATH 315.*

### **MATH 318. Modern Matrix Theory and Linear Algebra**

The LU, QR, symmetric, polar, and singular value matrix decompositions. Schur and Jordan normal forms. Symmetric, positive-definite, normal and unitary matrices. Perron-Frobenius theory and graph criteria in the theory of non-negative matrices.

*3 credits, Lecture.*

### **MATH 321. Topics in Algebra**

Advanced topics from group theory, abelian groups, rings and homological algebra, Lie algebras, algebraic groups, group rings, combinatorics.

*3 credits, Lecture. Prerequisite: MATH 316.*

### **MATH 322. Probability Theory and Stochastic Processes I**

Convergence of random variables and their probability laws, maximal inequalities, series of independent random variables and laws of large numbers, central limit theorems, martingales, Brownian motion. Contemporary theory of stochastic processes, including stopping times, stochastic integration, stochastic differential equations and Markov processes, Gaussian processes, and empirical and related processes with applications in asymptotic statistics.

*3 credits, Lecture. Prerequisite: MATH 303.*

### **MATH 323. Probability Theory and Stochastic Processes II**

Convergence of random variables and their probability laws, maximal inequalities, series of independent random variables and laws of large numbers, central limit theorems, martingales, Brownian motion. Contemporary theory of stochastic processes, including stopping times, stochastic integration, stochastic differential equations and Markov processes, Gaussian

processes, and empirical and related processes with applications in asymptotic statistics.

*3 credits, Lecture. Prerequisite: MATH 322.*

**MATH 325. Ordinary Differential Equations**

Existence and uniqueness of solutions, stability and asymptotic behavior. If time permits: eigenvalue problems, dynamical systems, existence and stability of periodic solutions.

*3 credits, Lecture. Prerequisite: MATH 303.*

**MATH 326. Partial Differential Equations**

Cauchy Kowalewsky Theorem, classification of second order equations, systems of hyperbolic equations, the wave equation, the potential equation, the heat equation in  $R^n$ .

*3 credits, Lecture. Prerequisite: MATH 340.*

**MATH 327. Topics in Applied Analysis I**

Advanced topics from the theory of ordinary or partial differential equations. Other possible topics: integral equations, optimization theory, the calculus of variations, advanced approximation theory.

*3 credits, Lecture. Instructor consent required.*

**MATH 328. Topics in Applied Analysis II**

Advanced topics from the theory of ordinary or partial differential equations. Other possible topics: integral equations, optimization theory, the calculus of variations, advanced approximation theory.

*3 credits, Lecture. Instructor consent required.*

**MATH 329. Introduction to Representation Theory**

Semi-simple rings, Jacobson radical, density theory, Wedderburn's Theorem, representations and characters of groups, orthogonality relations, Burnside's theorem.

*3 credits, Lecture. Prerequisite: MATH 315.*

**MATH 330. Algebraic Number Theory**

Valuations,  $p$ -adic and local fields, ideal theory of Dedekind domains, cyclotomic extensions, units in algebraic number fields.

*3 credits, Lecture. Prerequisite: MATH 316.*

**MATH 332. Topics in Analysis I**

*3 credits, Lecture. Instructor consent required.*

**MATH 333. Topics in Analysis II**

*3 credits, Lecture. Instructor consent required. Prerequisite: MATH 332.*

**MATH 335. Mathematical Logic I**

Predicate calculus, completeness, compactness, Lowenheim-Skolem theorems, formal theories with applications to algebra, Godel's incompleteness theorem. Further topics chosen from: axiomatic set theory, model theory, recursion theory, computational complexity, automata theory and formal languages.

*3 credits, Lecture. Prerequisite: MATH 315.*

**MATH 336. Mathematical Logic II**

Predicate calculus, completeness, compactness, Lowenheim-Skolem theorems, formal theories with applications to algebra, Godel's incompleteness theorem. Further topics chosen from: axiomatic set theory, model theory, recursion theory, computational complexity, automata theory and formal languages.

*3 credits, Lecture. Prerequisite: MATH 335.*

**MATH 337. Topics in Geometry and Topology I**

Advanced topics from uniform spaces, topological groups, Lie groups, fiber spaces, theory of submanifolds, PL topology, differential topology, cohomology operations, complex manifolds, Riemannian manifolds, transformation groups, fixed point theory.

*3 credits, Lecture. Instructor consent required.*

**MATH 338. Topics in Geometry and Topology II**

Advanced topics from uniform spaces, topological groups, Lie groups, fiber spaces, theory of submanifolds, PL topology, differential topology, cohomology operations, complex manifolds, Riemannian manifolds, transformation groups, fixed point theory.

*3 credits, Lecture. Instructor consent required.*

*Prerequisite: 337.*

**MATH 340. Complex Function Theory I**

An introduction to the theory of analytic functions, with emphasis on modern points of view.

*3 credits, Lecture. Prerequisite: MATH 301.*

**MATH 341. Complex Function Theory II**

Further investigation into selected topics such as the theory of entire functions, conformal mapping, automorphic functions or potential theory.

*3 credits, Lecture. Prerequisite: MATH 340.*

**MATH 342. Finite Element Solution Methods I**

Numerical solution of elliptic, parabolic and hyperbolic partial differential equations by finite element solution methods. Applications.

*3 credits, Lecture.*

**MATH 343. Finite Element Solution Methods II**

Numerical solution of elliptic, parabolic and hyperbolic partial differential equations by finite element solution methods. Applications.

*3 credits, Lecture. Prerequisite: MATH 342.*

**MATH 347. Tensor Calculus I**

An introduction to tensor algebra and tensor calculus with applications chosen from the fields of the physical sciences and mathematics.

*3 credits, Lecture. Instructor consent required.*

**MATH 348. Tensor Calculus II**

An introduction to tensor algebra and tensor calculus with applications chosen from the fields of the physical sciences and mathematics.

*3 credits, Lecture. Instructor consent required.*

*Prerequisite: MATH 347.*

**MATH 352. Introduction to Complex Variables**

Functions of a complex variable, integration in the complex plane, conformal mapping.

*3 credits, Lecture.*

**MATH 354. Functional Analysis I**

Normed linear spaces and algebras, the theory of linear operators, spectral analysis.

*3 credits Lecture. Prerequisites: MATH 303 and MATH 316.*

**MATH 355. Functional Analysis II**

Normed linear spaces and algebras, the theory of linear operators, spectral analysis.

*3 credits, Lecture. Prerequisite: MATH 354.*

**MATH 357. Differential Geometry**

An introduction to the study of differentiable manifolds on which various differential and integral calculi are developed. A special emphasis is placed on the global aspects of modern differential geometry.

*3 credits, Lecture.*

**MATH 365. Financial Mathematics I**

The mathematics of measurement of interest, accumulation and discount, present value, annuities, loans, bonds, and other securities.

*3 credits, Lecture. Not open to students who have passed MATH 285Q.*

**MATH 366. Introduction to Operations Research**

Introduction to the use of mathematical and statistical techniques to solve a wide variety of organizational problems. Topics include linear programming, project scheduling, queuing theory, decision analysis, dynamic and integer programming and computer simulation.

*3 credits, Lecture. Not open to students who have passed MATH 286, STAT 286, or STAT 356.*

**MATH 369. Financial Mathematics II**

The continuation of MATH 365. Measurement of financial risk, the mathematics of capital budgeting, mathematical analysis of financial decisions and capital structure, and option pricing theory.

*3 credits, Lecture. Not open to students who have passed MATH 289.*

**MATH 373. Algebraic Topology I**

Complexes, homology and cohomology groups, homotopy theory.

*3 credits, Lecture. Prerequisite: MATH 316 and MATH 307, which may be taken concurrently.*

**MATH 374. Algebraic Topology II**

Complexes, homology and cohomology groups, homotopy theory.

*3 credits, Lecture. Prerequisite: MATH 373.*

**MATH 377. Applied Analysis**

Convergence of Fourier Series, Legendre and Hermite polynomials, existence and uniqueness theorems, two point boundary value problems



and Green's functions.

*3 credits, Lecture. Not open to students who have passed MATH 277. May not be used for credit for Mathematics graduate degrees.*

**MATH 378. Introduction to Partial Differential Equations**

Solution of first and second order partial differential equations with applications to engineering and science.

*3 credits, Lecture.*

**MATH 381. Fourier Analysis**

Foundations of harmonic analysis developed through the study of Fourier series and Fourier transforms.

*3 credits, Lecture. Prerequisites: MATH 303 and MATH341.*

**MATH 382. Fourier Analysis on Groups**

*3 credits, Lecture. Prerequisites: MATH 303 and MATH 341.*

**MATH 385. Vector Field Theory I**

Vector algebra and vector calculus with particular emphasis on invariance. Classification of vector fields. Solution of the partial differential equations of field theory.

*3 credits, Lecture. Instructor consent required.*

**MATH 386. Vector Field Theory II**

Vector algebra and vector calculus with particular emphasis on invariance. Classification of vector fields. Solution of the partial differential equations of field theory.

*3 credits, Lecture. Instructor consent required.*

*Prerequisite: MATH 385.*

**MATH 387. Actuarial Mathematics I**

Survival distributions, claim frequency and severity distributions, life tables, life insurance, life annuities, net premiums, net premium reserves, multiple life functions, and multiple decrement models.

*3 credits, Lecture. Prerequisite: MATH 231 or STAT 230, and MATH 285 or MATH 365, which may be taken concurrently. Not open to students who have passed MATH 287.*

**MATH 388. Actuarial Mathematics II**

Survival distributions, claim frequency and severity distributions, life tables, life insurance, life annuities, net premiums, net premium reserves, multiple life functions, and multiple decrement models.

*3 credits, Lecture. Prerequisite: MATH 387. Not open to students who have passed MATH 288.*

**MATH 392. Advanced Topics in Actuarial Mathematics I**

Survival models, mathematical graduation, or demography.

*3 credits, Lecture. Instructor consent required.*

**MATH 393. Advanced Topics in Actuarial Mathematics II**

Credibility theory or advanced theory of interest.

*3 credits, Lecture. Instructor consent required.*

**MATH 394. Survival Models**

Analysis, estimation, and validation of lifetime tables.

*3 credits, Lecture. Prerequisite: MATH 387 and STAT 231.*

**MATH 395. Risk Theory**

Individual risk theory, distribution theory, ruin theory, stoploss, reinsurance and Monte Carlo methods. Emphasis is on problems in insurance.

*3 credits, Lecture.*

†**GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

†**GRAD 396. Full-Time Master's Research**

*3 credits.*

†**GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**MATH 401. Seminar in Current Mathematical Literature**

Participation and presentation of mathematical papers in joint student faculty seminars. Variable topics.

*1 - 6 credits, Seminar.*

†**MATH 410. Seminar in Algebra**

*1 - 6 credits, Seminar. Prerequisite: MATH 316.*

†**MATH 430. Seminar in Geometry**

*1 - 6 credits, Seminar. Prerequisite: MATH 357.*

†**MATH 450. Seminar in Analysis**

*1 - 6 credits, Seminar.*

**MATH 460. Computers in Mathematical Research**

*1 credit, Lecture.*

†**MATH 470. Seminar in Topology**

*1 - 6 credits, Seminar. Prerequisite: MATH 374.*

†**MATH 471. Seminar in Set Theory**

*1 - 6 credits, Seminar. Prerequisite: MATH 307.*

†**MATH 480. Seminar in Applied Mathematics**

*1 - 6 credits, Seminar.*

†**GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

†**GRAD 496. Full-Time Doctoral Research**

*3 credits.*

†**GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

## MECHANICAL ENGINEERING

*Department Head:* Professor Theodore L. Bergman  
*Professors:* Barber, Cetegen, Faghri, Jordan, Kazerounian, Koenig, Langston, Olgac, Reifsnider, and Sammes  
*Associate Professors:* Bennett, Bzymek, Jeffers, Murphy, Pitchumani, and Zhang  
*Assistant Professors:* Chiu, Cowart, Renfro, and Zhang

The Department of Mechanical Engineering offers study leading to the degree of Master of Science and Doctor of Philosophy in mechanical engineering. It also cooperates with other departments to provide doctoral study in other areas (see "Applied Mechanics," "Biomedical Engineering," and "Fluid Dynamics").

Students working toward the M.S. degree following Plan B are required to earn thirty credits.

Non-degree students may register for courses in the Department of Mechanical Engineering with the approval of the department head.

Most graduate students receive financial support in the form of graduate teaching or research assistantships.

**Mechanical Engineering.** Students working toward the M.S. degree in mechanical engineering may choose, in consultation with their advisory committee, from a wide selection of courses in this and other departments.

The research and course offerings in applied mechanics focus on new applications of the fundamental principles of mechanics which govern the deformation and motion of solids. Current research topics include the mechanics of thin films, viscoplasticity, fracture mechanics, nanomechanics, fuel cells, nonlinear dynamics, and stability.

The research and course offerings in thermodynamics and heat transfer include classical and statistical theories of thermodynamics and studies of conduction, convection, and radiation. Engineering applications of the fundamental principles of many systems, processes, and devices, such as gas turbines, thermal manufacturing, fuel cells, and combustion, are treated.

The research and instruction offerings in design include automation, computer-aided design, kinematics, lubrication, manufacturing, material behavior, optimization, and vibration.

**The Ph.D. Program.** Ph.D. students are expected to take an exploratory screening examination early in the program. Doctoral students normally take eight or more semester courses beyond the M.S. degree and conduct research.

**Facilities.** The laboratories of the Department of Mechanical Engineering are equipped with several major facilities as well as ancillary equipment. A list of Mechanical Engineering laboratories and facilities may be found at the Department website: <<http://www.engr.uconn.edu/me>>.

### COURSES OF STUDY

#### ME 300. Independent Study in Mechanical Engineering

Individual exploration of special topics as arranged by student and instructor.  
 1 – 6 credits, *Independent Study. Instructor consent required.*

#### ME 301. Macroscopic Equilibrium Thermodynamics I

Review of zeroth, first and second laws of thermodynamics, development of equilibrium thermodynamics from a postulatory viewpoint, examination of thermodynamic potentials and equilibrium states, stability of thermodynamic systems including implications on phase and chemical equilibrium. Thermodynamic availability analysis.  
 3 credits, *Lecture.*

#### ME 302. Macroscopic Equilibrium Thermodynamics II

Review of zeroth, first and second laws of thermodynamics, development of equilibrium thermodynamics from a postulatory viewpoint, examination of thermodynamic potentials and equilibrium states, stability of thermodynamic systems including implications on phase and chemical equilibrium. Thermodynamic availability analysis.  
 3 credits, *Lecture. Prerequisite: ME 301.*

#### ME 303. Macroscopic Non-equilibrium Thermodynamics I

A study of the laws and equations applicable to non-equilibrium processes of a very general nature; this will include the conservation laws, entropy law and entropy balance, the phenomenological equations. Onsager's relations and the fluctuation dissipation theorem. Selected application of the foundations will include heat conduction, diffusion and cross effects, viscous flow and relaxation phenomena, and discontinuous system processes.  
 3 credits, *Lecture. Instructor consent required. Prerequisite: ME 302.*

#### ME 304. Macroscopic Non-equilibrium Thermodynamics II

A study of the laws and equations applicable to non-equilibrium processes of a very general nature; this will include the conservation laws, entropy law and entropy balance, the phenomenological equations. Onsager's relations and the fluctuation dissipation theorem. Selected application of the foundations will include heat conduction, diffusion and cross effects, viscous flow and relaxation phenomena, and discontinuous system processes.  
 3 credits, *Lecture. Instructor consent required. Prerequisite: ME 303.*

#### ME 305. Basic Concepts of Continuum Mechanics

An introductory course in the theory of continuum mechanics. Development of physical principles using cartesian tensors. Concepts of stress, strain and motion. Basic field equation for the Newtonian fluid and the elastic solid.  
 3 credits, *Lecture.*

#### ME 307. Engineering Analysis I

Matrix algebra, indicial notation and coordinate transformations. Cartesian and general vectors and tensors, vector and tensor calculus. Partial differential equations: Fourier series, solution procedures to boundary value problems in various domains. Application to the mechanics of continuous media.  
 3 credits, *Lecture.*

#### ME 308. Engineering Analysis II

Calculus of variations including transversality conditions, constraints, Lagrange multipliers, Rayleigh-Ritz and Galerkin methods. Integral transform techniques including Laplace, Fourier, Hankel, and Mellin transforms, Integral equations.  
 3 credits, *Lecture. Instructor consent required.*

#### ME 311. Statistical Thermodynamics

A microscopic development of thermodynamics including statistical ensembles, quantum statistical mechanics, and a comparison of various molecular models.  
 3 credits, *Lecture.*

#### ME 312. Laminar Viscous Flow

Derivation of the Navier Stokes Equation. Exact solutions of the Navier Stokes Equation. Derivation of laminar boundary layer equations for plan and axially symmetric flow. Methods of solution of the laminar boundary layer equations including Blasius solution, momentum integral method and Falkner-Skan similarity solutions. Application to the flow over plates and bodies of various shapes. Jets and wakes.  
 3 credits, *Lecture.*

#### ME 313. Flow of Compressible Fluids I

Equations of motion of a compressible fluid. Quasi-one-dimensional flow including effects of friction, heat addition, and normal shocks. Two and three dimensional flows. Velocity potential and stream function. Small perturbation theory. Subsonic pressure correction formulas. Kelvin and Crocco Theorems. Method of characteristics for steady and unsteady, rotational and irrotational flows. Curved and oblique shock waves. Shock tube theory.  
 3 credits, *Lecture.*

#### ME 314. Flow of Compressible Fluids II

Equations of motion of a compressible fluid. Quasi-one-dimensional flow including effects of

friction, heat addition, and normal shocks. Two and three dimensional flows. Velocity potential and stream function. Small perturbation theory. Subsonic pressure correction formulas. Kelvin and Crocco Theorems. Method of characteristics for steady and unsteady, rotational and irrotational flows. Curved and oblique shock waves. Shock tube theory.

*3 credits, Lecture. Prerequisite: ME 313.*

**ME 315. Hypersonic Aerodynamics**

Hypersonic small disturbance theory; similarity laws. Newtonian, shock-expansion and blast-wave theories of hypersonic flow. Aerodynamic shapes for minimum hypersonic drag. Physical properties of real gases; shock waves in real gas flow.

*3 credits, Lecture. Prerequisite: ME 313.*

**ME 317. Aerothermal Analysis**

High-speed, viscous compressible flow. Equations of motion. Thermodynamic and transport properties of high temperature gases. Blunt body heating. Boundary layer equations and transformations. Hypersonic boundary layers with heat and mass transfer. Reference enthalpy methods.

*3 credits, Lecture. Instructor consent required.*

*Prerequisite: ME 313.*

**ME 318. Computational Methods of Viscous Fluid Dynamics**

An advanced course on integral and finite-difference methods of solution of the parabolic and elliptic equations of viscous fluid flow. Method of weighted residuals; Crank-Nicolson; Dufort-Frankel; Peaceman-Rachford alternating direction method; truncation error analysis; stability. Applications to boundary layer and heat transfer problems. A background of FORTRAN programming and numerical analysis is necessary.

*3 credits, Lecture. Instructor consent required.*

**ME 320. Special Topics in Mechanical Engineering**

Classroom and/or laboratory courses in special topics as announced in advance for each semester. The field of study or investigation is to be approved by the Head of the Department before announcement of the course.

*1 – 3 credits, Lecture. Instructor consent required.*

**ME 321. Conduction Heat Transfer**

Mathematical development of the fundamental equations of heat conduction in the steady and unsteady state, with or without internal heat generation or absorption. Study of exact and approximate methods used in the solution of heat conduction boundary value problems. Analytical, graphical, numerical and experimental evaluation of the temperature field in conducting media.

*3 credits, Lecture.*

**ME 323. Convection Heat Transfer**

A study of heat transfer to laminar and turbulent boundary layers for both compressible and incompressible fluids. Free convection heat transfer is also investigated.

*3 credits, Lecture.*

**ME 324. Radiation Heat Transfer**

Fundamentals of radiative emission (black body behavior and Planck's law), surface properties (emissivity, absorptivity, reflectivity, and transmissivity), electromagnetic theory for prediction of radiative properties, development of the methods of solution for radiant energy interchange between surfaces and in enclosures with and without absorbing, emitting, and scattering media present.

*3 credits, Lecture. Prerequisite: ME 307.*

**ME 326. Heat and Mass Transfer in Multi-Phase Systems**

The mechanics of heat and mass transfer and fluid flow with phase change, i.e., condensation, nucleate and film boiling, freezing, melting, sublimation, and ablation. Adiabatic and diabatic flow of multi-phase fluids in single or multi-component systems.

*3 credits, Lecture. Prerequisite: ME 323.*

**ME 327. Applied Solar Energy**

Study of the technology and economics of solar energy conversion to useful forms. Review of heat transfer and energy storage. Collector design and performance analysis. System design of water heaters and space heating/cooling systems. Review of wind power, wave power, ocean thermal energy conversion and satellite solar power systems.

*3 credits, Lecture. Prerequisite: ME 321 and ME 242.*

**ME 331. Analytical and Applied Kinematics**

Analytical methods of coordinate transformation and two and three dimensional motion, analysis of relative motion and relative freedom through kinematics connections, study of finite and instantaneous properties of motion, study of the geometry of single and multi-parameter engineering curves, surfaces and motions. Application in the analysis and design of linkages and mechanisms.

*3 credits, Lecture.*

**ME 335. Principles of Optimum Design**

Engineering modeling and optimization for graduate students in all areas of engineering. Problem formulation, mathematical modeling, constrained and unconstrained optimization, interior and boundary optima constraint interaction, feasibility and boundedness, model reduction, sensitivity analysis, linear programming, geometric programming, nonlinear programming, and numerical methods in optimization.

*3 credits, Lecture. Not open to students who have passed ME 334.*

**ME 337. Advanced Optimum Design**

Advanced techniques in engineering design and process modeling optimization for graduate students in all areas of engineering. Review of theories of multi-variable constrained and unconstrained optimization, and computational techniques in nonlinear programming, structured programming, including integer programming, quadratic programming, genetic algorithms, theories of multivariable optimization from calculus of variations, computational techniques in functional optimization.

*3 credits, Lecture. Prerequisite: MATH 272Q, ME 334, or ME 335.*

**ME 338. Turbines and Centrifugal Machinery**

Theory, design and performance of centrifugal and axial flow machinery including turbines, blowers, fans, compressors, superchargers, pumps, fluid couplings and torque converters. A detailed study of the mechanics of the transfer of energy between a fluid and a rotor.

*3 credits, Lecture. Prerequisite: ME 313.*

**ME 342. Reaction Engines**

Dynamics of gas flow, including heat addition of friction. Thermodynamic analysis of ram-jets, gas turbines and rockets and their components. Principles of propulsion systems. Nuclear, thermoelectric, ionic, and high energy propulsion devices.

*3 credits, Lecture. Prerequisite: ME 313.*

**ME 344. Advanced Internal Combustion Engines**

An analytical study of the factors influencing the operation and performance of the internal combustion engine. Spark-ignition and compression ignition engine theory. Emphasis on the latest analytical and experimental developments.

*3 credits, Lecture. Prerequisite: ME 251 or ME 301.*

**ME 346. Combustion and Air Pollution Engineering**

Review of thermodynamics and chemical equilibrium. Introduction to chemical kinetics. Studies of combustion processes, including diffusion and premixed flames. Combustion of gases, liquid, and solid phases, with emphasis on pollution minimization from stationary and mobile systems. Air pollution measurement and instrumentation.

*3 credits, Lecture.*

**ME 347. Environmental Engineering**

Design and arrangement of heating, air conditioning and refrigeration equipment and controls to meet comfort and industrial process requirements.

*3 credits, Lecture. Prerequisite: ME 250 or ME 301.*

**ME 349. Modern Computational Mechanics**

An advanced course in Computational Mechanics with emphasis on modeling problems using Finite Differences and Finite Element tech-



niques. Projects include initial value problems, ordinary differential equations and partial differential equations. Course evaluation is made by the successful completion of several assigned projects.

*3 credits, Lecture.*

#### **ME 351. Advanced Combustion**

Review of thermodynamic properties, transport properties, conservation equations of multicomponent reacting gas. Introduction to chemical kinetics. Classification of combustion waves. Deflagrations, detonations and diffusion flames. Ignition phenomena, droplet and spray combustion and some aspects of turbulent combustion.

*3 credits, Lecture. Prerequisite: either ME 234 and ME 250 or ME 346.*

#### **ME 352. Seminar in Combustion Generated Pollution**

A study of the mechanism of production of pollutants such as nitrogen oxides, carbon monoxide, sulphur dioxide, soot and unburned hydrocarbons from power plants such as stationary gas turbines, internal combustion engines, and jet engines. Emphasis will be placed on current research problems and recent advances in combustor designs.

*3 credits, Lecture. Prerequisite: either ME 351 or ENVE 341.*

#### **ME 356. Computer Graphics for Design**

A practical study of interactive computer graphics as applied to engineering design. Graphics hardware, interactive techniques, transformations, remote graphic systems, and stand-alone minicomputer based systems are discussed emphasizing their application in engineering design. Practical experience is gained through assignments involving various graphics systems.

*3 credits, Lecture. Instructor consent required.*

#### **ME 357. Wave Propagation in Continuous Media**

General dynamical equations for linear elastic media including both solids and fluids. Wave propagation in elastic rods, plates, cylinders, and semi-infinite and infinite solids. Rayleigh and Love waves; Layered media; reflection and refraction.

*3 credits, Lecture. Prerequisite: ME 305.*

#### **ME 358. Theory of Elasticity**

The mathematical theory of linear elasticity. The theory of torsion of prismatic members. Two-dimensional elasticity problems. Thermal stress. Variational methods.

*3 credits, Lecture. Prerequisite: ME 305.*

#### **ME 359. Tribology**

The theory of fluid film lubrication, including hydrodynamic, externally pressurized and squeeze film mechanisms of load support in bearings. Fixed and pivot pad thrust bearings; air bearings; journal bearings.

Elastohydrodynamic lubrication; boundary

lubrication; liquid and solid lubricants. Direct solid contact and rolling element contact bearings. Theories of wear. Design considerations in lubrication and wear.

*3 credits, Lecture.*

#### **ME 360. Dynamics**

Three-dimensional particle and rigid-body mechanics. Particle kinematics. Newton's laws, energy and momentum principles. Systems of particles. Rigid body kinematics, coordinate transformations. Rigid body dynamics, Euler's equations. Gyroscopic motion. Lagrange's equations.

*3 credits, Lecture.*

#### **ME 361. Advanced Dynamics**

Variational principles of mechanics: Legranges equations, Hamilton's principle. Hamilton-Jacobi theory, canonical transformations, integrability. Introduction to special relativity, applications to orbital problems. Current topics in analytical dynamics.

*3 credits, Lecture. Prerequisite: ME 360.*

#### **ME 362. Mechanical Vibrations I**

Variational principles, Lagrange's equation. Equations of motion for multi-degree of freedom systems. Free vibration eigenvalue problem: modal analysis. Forced solutions: general solutions, resonance, effect of damping, and superposition. Vibrations of continuous systems: vibration frequencies and mode shapes for strings, bars, membranes, beams, and plates. Experimental methods and techniques.

*3 credits, Lecture.*

#### **ME 363. Mechanical Vibrations II**

Variational mechanics, Hamilton's principle, and energy formulations for linearly inelastic bodies. Eigenvalue and boundary-value problems. Non-self adjoint systems. Approximate methods: Ritz and Galerkin. Gyroscopic systems. Nonconservative systems. Perturbation theory for the eigenvalue problem. Dynamics of constrained systems.

*3 credits, Lecture. Prerequisite: ME 362.*

#### **ME 364. Mechanics of Composites and Laminates**

Review of elasticity theory. Average theorems. Effective constitutive relations for heterogeneous media. Variational bounding. Isotropic elastic composites fiber reinforced and laminated materials.

*3 credits, Lecture. Prerequisite: either ME358 or CE 324.*

#### **ME 365. Fatigue in Mechanical Design**

Design calculation methods for the fatigue life of engineering components, fundamentals of fracture mechanics. Crack initiation and crack propagation fatigue lives. Neuber analysis, multiaxial stress, cyclic stress-strain behavior, mean and residual stress effects. Selected current research topics, advanced research and

design projects.

*3 credits, Lecture. Not open to students who have passed ME 228.*

#### **ME 367. Principles of Machine Tool Design**

The basic principles and philosophies in the design of precision machine tools. Mathematical theory and precision machine tools. Mathematical theory and physics of errors. The building up of error budget and the mapping of geometric and thermal errors. Design case study of a precision machine tool. Discussion of various types of sensors and actuators, bearings, and transmissions. System design considerations.

*3 credits, Lecture.*

#### **ME 369. Theory of Plasticity**

Introduces the physical basis for inelastic behavior and various mathematical descriptions for non-linear deformation. Provides an overview of plastic deformation in metals, including the role of dislocation behavior in strain hardening and strengthening. Detailed topics include yield surfaces, flow rules, hardening rules and introduction to viscoplastic modeling; emphasis is on finite element computer-based implementation of the concepts and their use in predicting the behavior of structures.

*3 credits, Lecture. Prerequisite: ME 358.*

#### **ME 371. Predictive Machinability**

Precision machining. Micromechanics in precision machining. Theories of energy dissipation in machining. Models for material-removal mechanisms. Models for interaction between cutting tool edge and workpiece. Precision machining of advanced materials. Tribological aspects in precision machining. Surface integrity. Machining tool positioning control and concept of minimum depth of cut.

*3 credits, Lecture.*

#### **ME 372. Theory and Design of Automatic Control Systems**

Design features of a closed loop control system. Laplace domain analysis of electromechanical, pneumatic, hydraulic, thermal, and mechanical systems. Computer simulation of dynamic responses using software tools. Stability issues, Routh analysis, root locus, Bode and Nyquist analyses are addressed. An open-ended, hands-on design project from a current research topic is assigned.

*3 credits, Lecture.*

#### **ME 373. Physical Acoustics**

The basic principles of the generation and propagation of sound. Mathematical theory of vibration and sound, including single and multi-dimensional waves in stationary and moving media. Physical properties of sound waves; propagation of sound in confined and free space; refraction, reflection, and scattering from strong and weak inhomogeneities.

*3 credits, Lecture. Instructor consent required.*

**ME 374. Underwater Sound**

The propagation of sound in sea-water, including effects of temperature and salinity gradients. Transducers. Flow noise.  
3 credits, Lecture. Instructor consent required.

**ME 375. Advanced Analysis and Design of Mechanisms**

Kinematic analysis and synthesis of planar and spatial linkages with lower pairs. Type and number synthesis. Finite position and higher order design. Unified treatment of position, path-angle and function generation problems. Approximation synthesis and optimization. Defect elimination and performance evaluation, introduction to commercial software.  
3 credits, Lecture. Prerequisite: either ME 224 or ME 331.

**ME 376. Robotic Manipulators**

Modeling of 3-D industrial robots; kinematic and dynamic analysis of manipulators. Manipulation techniques. Design workspace and performance criteria. Review of control techniques. Hardware requirements. On-line and off-line optimal trajectory planning.  
3 credits, Lecture. Prerequisite: either ME 224 and ME 230 or ME 372.

**ME 377. Non-Linear Vibrations**

Vibrations of non-linear single-degree-of-freedom systems. Singular points. Liapunoff function. Approximation techniques. Stability. Self-excited vibrations. Vibrations of non-linear multi-degree-of-freedom systems.  
3 credits, Lecture.

**ME 378. Random Vibrations**

Introduction to theory of sets. Statistical preliminaries. Fourier transforms. Random vibrations of single-degree-of-freedom and two-degree-of-freedom systems. Random vibrations of systems with distributed mass. Theories of failure.  
3 credits, Lecture. Prerequisite: ME 363 and MATH 231.

**ME 379. Advances in Control Systems Design**

Review of the state space design concepts for control systems. Mathematical modeling of dynamic systems. Lagrange's and Newton's representations. Decentralized or linearized control. Variable structure systems. Sliding mode control of nonlinear systems and discussions of constraint control cases. Time-delayed systems. Stability-based analysis and synthesis. Engineering applications. Open-ended control system design projects.  
3 credits, Lecture. Prerequisite: ME 230 or ME 372 or ME 307.

**ME 383. Marine Vehicle Hydrodynamics**

Potential flow. Modifications to potential theory which take account of real fluid effects, such as skin friction, separation, and surface wave

resistance. Hydrodynamic considerations in hull design.  
3 credits, Lecture.

**ME 384. Marine Vehicle Propulsion and Control**

Requirements of propulsion equipment for surface and submerged vehicles: internal combustion engines, turbines, nuclear power plants. Propellor theory. Control of buoyancy for submersibles. Maneuverability.  
3 credits, Lecture. Prerequisite: ME 383.

**ME 385. Submersible Structures**

Design of pressure vessels. Methods of stiffening of shell structures. Requirements imposed by the underwater environment.  
3 credits, Lecture. Prerequisite: ME 305.

**ME 386. Computer Integrated Manufacturing Systems**

Topics in Computer Integrated Manufacturing (CIM) including the fundamentals of automated manufacturing systems; production economics; Just-In-Time (JIT) and Shop Floor Control (SFC) techniques; Computer Numerical Control (CNC) and off-line programming; Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), and release and control of the engineering and manufacturing of new products. Advanced design and research projects.  
3 credits, Lecture. Instructor consent required. Not open to students who have passed ME 221.

**ME 387. Design and Engineering Production Systems**

Design and engineering functions of production systems. Decision-Making Process, Economic Analysis, Demand Forecasting, Product and Process Design, Optimization and Linear Programming, Integrated Production and Inventory Control, Production Scheduling, Critical Path Methods (CPM), Program Evaluation and Review Technique (PERT), and Statistical Quality Control. Advanced design and research projects.  
3 credits, Lecture. Instructor consent required. Not open to students who have passed ME 222.

**ME 392. Advanced Measurement Techniques**

A critical examination of measurement techniques. Principles of operation of various instruments. Estimates of accuracy, precision, and resolution of measurements. Intended primarily for students contemplating experimental theses. When possible, specific topics covered will be structured to the needs of the class.  
1 - 3 credits, Lecture. Instructor consent required.

†GRAD 395. Master's Thesis Research  
1 - 9 credits.

†GRAD 396. Full-Time Master's Research  
3 credits.

†GRAD 397. Full-Time Directed Studies (Master's Level)  
3 credits.

GRAD 398. Special Readings (Master's)  
Non-credit.

GRAD 399. Thesis Preparation  
Non-credit.

**ME 401. Graduate Seminar**

Presentations by invited guest speakers on topics of current interest in various Mechanical Engineering and allied fields.  
0 credits, Seminar.

†GRAD 495. Doctoral Dissertation Research  
1 - 9 credits.

†GRAD 496. Full-Time Doctoral Research  
3 credits.

†GRAD 497. Full-Time Directed Studies (Doctoral Level)  
3 credits.

GRAD 498. Special Readings (Doctoral)  
Non-credit.

GRAD 499. Dissertation Preparation  
Non-credit.

## MEDIEVAL STUDIES

Interdisciplinary work leading to the degrees of Master of Arts and Doctor of Philosophy in medieval studies is offered by the Departments of Art, English, History, Modern and Classical Languages, and Philosophy. Since the program in medieval studies is intended to provide a synthesis of broad areas of medieval culture and thought as a basis for constructive research in specialized aspects of cultural and intellectual history, students normally are required to include in their programs courses offered by the supporting departments.

**Admission to Degree Programs.** The Medieval Studies Admissions Committee accepts students either to the master's or Ph.D. program. An undergraduate major in the area of study is not necessarily required, but before admission students must give evidence of adequate preparation to work in their proposed area of emphasis.

**The M.A. Program.** Work leading to the degree of Master of Arts in medieval studies may be undertaken under either Plan A (with thesis) or Plan B (without thesis). In either case, course work in medieval studies should be distributed among several departments, and the student's advisory committee is composed of representatives of three departments.

**The Ph.D. Program.** Approximately one half of the course work required for the degree of Doctor of Philosophy in medieval studies should be in the department of emphasis, the remaining half to be taken in two or more other cooperating departments. In addition to the Graduate School's requirements for the doctorate, reading examinations in three foreign languages, normally French, German, and Latin, are required of all students in the program. It is expected that the student will pass these examinations immediately upon admission and in no case later than the end of the first year of study in the Ph.D. program. The student's advisory committee will consist of representatives of three different cooperating departments.

**Courses of study.** Course offerings and staff are listed under the cooperating and supporting departments referred to above. The Committee for Medieval Studies organizes a number of colloquia open to graduate students, featuring staff members or visitors.

**Support.** University Predoctoral Fellowships and graduate assistantships for teaching or research are available through cooperating departments for qualified students in the medieval studies program. Other support available for graduate students is described under "University Fellowships and Other Aid."

**Major Advisors:** J. Givens, art history; D. Caner and R. Travis, Classics and Ancient Mediterranean Studies; C. D. Benson, F. Biggs, R. Hasenfratz, and T. J. Jambeck, English; L. Langer and S. Olson, history; A. Berthelot, French; M. Masciardo, Italian; and B. Liu, Spanish.

## METALLURGY AND MATERIALS ENGINEERING

*Department Head:* Professor John E. Morral

*Distinguished Professor:* Brody

*Professors:* Blackburn, Galligan, Gell, Greene, Kattamis, and Marcus

*Associate Professors:* Aindow, Padture, and L. Shaw

*Assistant Professors:* Alpay and Wei

The goal of the graduate program in Metallurgy and Materials Engineering, through its coursework and research programs, is to provide students with a comprehensive understanding of modern materials and to prepare for positions of leadership in engineering, research and development. Graduate instruction is offered which leads to the degrees of Master of Science and Doctor of Philosophy. Degree candidates can undertake study in the field of Metallurgy and Materials Engineering or in areas within the field of Material Science such as biomaterials (see also the program description under "Materials Science"). Emphasis is placed on the relationships between the structure and properties of engineering materials, thermodynamics of materials, phase equilibria, mechanical behavior, electronic behavior and microstructural characterization. The main aspects of these subjects are covered in 6 designated core courses (see the descriptions for courses MMAT 301, 305, 309, 311, 317 and 322 below). Several other departments in the University offer courses in related disciplines, and students are encouraged to include one or more of these courses in their plans of study.

**Requirements for the M.S.** There are no special requirements for the admission to the master's program beyond those of the Graduate School. Selection of Plan A (thesis) or Plan B (course work) is made after consultation with the advisory committee. Students are required to complete 3 of the 6 graduate core courses as part of their coursework requirements.

**Requirements for the Ph.D.** Admission to the doctoral program is based upon a careful assessment of the students potential for creative research in metallurgy and materials engineering. Applicants for this program will normally have first completed an outstanding master's degree program. Students are required to complete all 6 of the graduate core courses as part of their coursework requirements, and to pass a General Examination based on these topics.

**Special Facilities.** The Department of Metallurgy and Materials Engineering is housed within the Institute of Materials Science. A comprehensive range of modern research equipment is available, including facilities for melting and casting of alloys, mechanical processing and heat treating, mechanical testing, electrical testing, processing and testing of ceramics and composites, transmission electron microscopes, scanning electron microscopes, x-ray diffraction apparatus, surface analysis equipment, thermal analysis equipment, and extensive spectrometry facilities (nuclear magnetic resonance, infra-red / Raman and ultra-violet).

## COURSES OF STUDY

### MMAT 301. Thermodynamics of Materials

Classical thermodynamics with emphasis on solutions and phase equilibria. Applications to unary and multicomponent, reacting and nonreacting, homogeneous and heterogeneous systems, including development of phase diagrams.

*3 credits, Lecture.*

### MMAT 303. Diffusion In Solids

Laws of Diffusion for binary and multicomponent systems, as well as for single and multi-phase systems. Diffusivity measurements and prediction. Modeling of interdiffusion with regard to diffusion couples, high temperature coatings, and gas-solid reactions using equation-solving and finite-difference software.

*3 credits, Lecture. Prerequisite: MMAT 301.*

### MMAT 305. Transformation in Alloys

Thermodynamics, kinetics and crystallography of phase transformations. Nucleation and growth kinetics. Order-disorder, ferroelectric, and ferromagnetic transformations.

*3 credits, Lecture.*

### MMAT 307. Solidification of Metals and Alloys

Thermodynamic and kinetic principles of solidification. Control of structure and properties of pure and multicomponent materials through casting and solidification processes. Application of solidification principles to shaped casting, continuous casting, crystal growth and particulate processes.

*3 credits, Lecture. Prerequisite: MMAT 301.*

### MMAT 308. Plasticity of Solids

Basic concepts of dislocations and other defects; relationship between basic deformation, thermal processes, and observable macroscopic properties. Strengthening mechanisms, e.g., solid solution hardening, dispersion hardening, and work hardening.

*3 credits, Lecture.*

### MMAT 309. Transport Phenomena in Materials Science and Engineering

Mechanisms and quantitative treatment of mass, energy, and momentum transfer will be discussed in the context of materials science and engineering applications. Increasingly complex and open-ended applications will be used to illustrate principles of fluid flow; heat conduction, radiation, and diffusion.

*3 credits, Lecture*

### MMAT 310. Mechanical Behavior of Ceramics and Composites

Physical and chemical properties of brittle fracture; strength; toughness; contact damage; microstructural toughening mechanisms; micromechanics; wear and fatigue; initiation of defects and flaws; elevated temperature creep;



reliability and lifetime prediction; designing with ceramics and composites.

*3 credits, Lecture.*

**MMAT 311. Mechanical Properties of Materials**

Mechanics of deformation and fracture; dislocation theory; strength of ductile and brittle materials; toughness; strengthening mechanisms; toughening mechanisms; creep mechanisms; fatigue crack initiation and propagation; reliability and lifetime prediction.

*3 credits, Lecture.*

**MMAT 313. Theory of the Solid State**

Modern theory of metals. Review of quantum theory, elementary wave mechanics, the free electron theory of metals, and the elementary band theory of solids. Crystallography, specific heat, dielectrics, magnetism, electrical conductivity.

*3 credits, Lecture.*

**MMAT 316. Fracture and Fatigue of Materials**

Ductile and brittle fracture, fatigue, stress corrosion, and creep rupture. Failure analysis.

*3 credits, Lecture.*

**MMAT 317. Electronic and Magnetic Properties of Materials**

Crystal structures and interatomic forces, lattice vibrations, thermal, acoustic, and optical properties. Semiconductors, dielectric properties, magnetism, and magnetic properties, superconductivity. Device applications.

*3 credits, Lecture.*

**MMAT 318. Thin Films and Protective Coatings**

Anodic and thermal formation of oxide layers; vapor deposition of metals and non-metals; electro-deposition; metallizing. Properties of films and coatings; dependence on impurity levels and environment. Alloy and coating design.

*3 credits, Lecture.*

**MMAT 320. Investigation of Special Topics**

Special courses or individual readings.

*3 credits, Lecture.*

**MMAT 321. Crystallography and Diffraction**

Introduction - diffraction of light. Crystal structure, symmetry and space groups. The reciprocal lattice. Diffraction of x-rays, electrons and neutrons. Kinematical diffraction -structure analysis and the effects of imperfections.

Dynamical scattering effects. Experimental methods and applications in Materials Science.

*3 credits, Lecture.*

**MMAT 322. Materials Characterization**

A review of the principal experimental methods used to reveal the microstructure and chemistry of materials. Diffraction techniques: x-ray, electron, neutron and proton scattering. Photon probes: photon microscopies, x-ray topography and XPS. Electron probes: SEM, TEM, EDX,

EELS, AES. Atom and ion probes: RBS, SIMS, FIM, PIXE. Scanned probe microscopies.

*3 credits, Lecture.*

**MMAT 323. Transmission Electron Microscopy**

Electron beam-specimen interactions. Basics of electron microscopes. Diffraction: theory, types of patterns and interpretation. Imaging: diffraction contrast, phase contrast and other techniques. Spectrometry: x-ray microanalysis and electron energy-loss spectrometry.

*3 credits, Lecture. Prerequisite: MMAT 322 or consent of instructor.*

**MMAT 325. Equilibrium Relationships in Multi-Phase Systems**

Thermodynamics of phase equilibria and phase diagram prediction for binary, ternary and n-component systems. Interpretation of phase diagram sections and projections. Application of multicomponent phase diagrams to alloy and process design..

*3 credits, Lecture. Prerequisite: MMAT 301.*

**MMAT 334. Structure and Defects in Materials**

Structure of amorphous and vitreous materials. Crystallography: translation symmetry and lattices, point and space groups, use of the International Tables for Crystallography, examples of simple crystal structures. Defects in materials: point defects, line defects, planar defects, homophase and heterophase interfaces.

Distributions of structure and defects: an introduction to microstructure.

*3 credits, Lecture.*

**MMAT 335. High Temperature Materials**

Strength-determining factors in advanced alloys, ceramics and composites. Role of material chemistry and microstructure. High temperature creep and crack growth. Oxidation. Thermomechanical behavior.

*3 credits, Lecture.*

**MMAT 337. Materials Processing**

Principles of powder preparation. Colloidal processing. Powder characterization. Consolidation and sintering of metals and ceramics. Microstructural evolution. Composites and coatings processing. Structure-property relations.

*3 credits, Lecture.*

**MMAT 343. Corrosion**

Mechanisms, characteristics and types of corrosion. Test methods and evaluation of corrosion resistance. Suitability of metals, ceramics, and organic materials in corrosive environments. Oxidation and other high temperature gas-metal reactions.

*3 credits, Lecture.*

**MMAT 344. Electrode Kinetics Measurements Laboratory**

The art and science of electrochemical measurements including potentiostatic,

galvanostatic and linear polarization; determination of Tafel constants and limiting diffusion currents; electrode preparation and cell design. Applications of these techniques to metal corrosion, etching, electropolishing, electroplating and metallurgical analyses by both experiments and independent student projects.

*3 credits, Lecture. Instructor consent required.*

**MMAT 345. Theory of Electrochemical Processes**

Theory and measurement of irreversible electrochemical processes at metal electrolyte interfaces. Mixed potential theory. Mass transport phenomena. Apparatus, techniques, and interpretation of experimental measurements. Applications to metallographic etching, phase extraction and electroanalytical techniques. Scientific development of corrosion-resistant alloys.

*3 credits, Lecture.*

**MMAT 349. Biomaterials**

For students with background in physical science and little or no background in biology. Molecular biology. Mineralized tissues. Cardiovascular system. Selected special topics in biological materials.

*3 credits, Lecture. Instructor consent required.*

**MMAT 362. Atomistic Computer Simulation of Materials**

Application of atomistic computer simulation to the study of structural materials. Classical models of atomic interactions: pair potentials, chemical bonding forces, embedded atom method and angular potentials. Molecular dynamics and Metropolis algorithms. Constraints on dynamics to control temperature, pressure and boundary conditions. Techniques for analyzing simulation results.

*3 credits, Lecture.*

**MMAT 364. Advanced Composites**

Mechanical properties, analysis and modeling of composite materials. The properties treated include stiffness, strength, fracture toughness, fatigue strength and creep resistance as they relate to fiber, whisker, particulate, and laminated composites.

*3 credits, Lecture.*

**MMAT 366. Alloy Casting Processes**

Principles and practices of alloy solidification and casting processes are discussed and applied in the context of sand, investment, permanent mold and die casting; continuous and direct chill casting; electroslag and vacuum arc remelting; crystal growth; rapid solidification; and laser coating.

*3 credits, Lecture.*

**MMAT 393 - 394. Seminar**

*0 credits, Seminar*

†GRAD 395. Master's Thesis Research  
1 - 9 credits.

†GRAD 396. Full-Time Master's Research  
3 credits.

†GRAD 397. Full-Time Directed Studies  
(Master's Level)  
3 credits.

GRAD 398. Special Readings (Master's)  
Non-credit.

GRAD 399. Thesis Preparation  
Non-credit.

†GRAD 495. Doctoral Dissertation Research  
1 - 9 credits.

†GRAD 496. Full-Time Doctoral Research  
3 credits.

†GRAD 497. Full-Time Directed Studies  
(Doctoral Level)  
3 credits.

GRAD 498. Special Readings (Doctoral)  
Non-credit.

GRAD 499. Dissertation Preparation  
Non-credit.

## MODERN AND CLASSICAL LANGUAGES

*Department Head:* Professor David K. Herzberger  
*Professors:* Berthelot, Gordon, Guénoun, Masciandaro,  
and Orringer

*Associate Professors:* Bouchard, Celestin, Chinchilla, DalMolin, Gomes, Liu, McNeece, Miller, Pardo, von Hammerstein, and Weidauer

*Assistant Professors:* Finger, Johnson, Loss, Melehy, Schreffler, Schiwy, Seda, and Travis

The Department offers courses in literature and philology leading to the degrees of Master of Arts and Doctor of Philosophy in French, German, Italian, and Spanish. Programs are available in Comparative Literary and Cultural Studies in cooperation with the Department of English and in Medieval Studies in cooperation with the Departments of Art, English, History, and Philosophy (see *Comparative Literary and Cultural Studies* and *Medieval Studies*). There also is supporting work in Greek, Latin, and Portuguese. Seminars numbered in the 400's are designed chiefly for doctoral students, but master's students occasionally are admitted.

**Admission.** All applicants are urged, and some may be required, to submit results of the Graduate Record Examinations for both the General Test and the Subject Test in their field. In the modern languages, applicants are expected to be able to participate in seminars at the graduate level conducted in the foreign languages.

**The M.A. Program.** Applicants normally are expected to have a bachelor's degree or its equivalent in the language. Students with insufficient undergraduate preparation may be accepted provisionally, but they are required to make up deficiencies before being admitted to regular graduate status. A research methodology course and a minimum of one semester of teaching experience are required of all M.A. candidates in German. M.A. students in German who emphasize philology are required to take at least two literature courses; students emphasizing literature or German studies are required to take at least one philology course. Candidates in Spanish are required to take the course in concepts of literary criticism. All master's candidates must pass a written and/or oral final examination.

**Special Requirements for the Ph.D.** Doctoral candidates are expected to demonstrate competence in reading scholarly material in two additional languages other than English, as designated by their advisory committees. For candidates in French, these normally are Latin and German.

Students in Spanish are required to present or to take a course in concepts of literary criticism.

In German, a research methodology course and a minimum of one semester of teaching experience at the college level are required of all doctoral candidates.

**Library Facilities.** The Homer Babbidge Library contains outstanding collections of texts and commentaries in the literature of the French Renaissance and a fine collection of texts in the literature of the Spanish Golden Age. The Latin American Collection is particularly strong in the Mexican, Chilean, and Argentine areas. There is a fine collection of German literature of the eighteenth, nineteenth, and twentieth centuries, and the collection of modern drama is outstanding. In addition, the Library houses an extensive collection of videotapes of German literary and cultural materials, and facilities for viewing them. Holdings in Italian literature and in intellectual history are extensive, especially in the modern period. The Risorgimento pamphlet collection stands out as one of the best available outside of Italy. Other holdings in modern and classical languages are sufficient for the pursuit of scholarly research in all languages and literatures offered.

### COURSES OF STUDY

#### Classics: Latin

**CAMS 301. Special Topics in Latin Literature**  
1 - 6 credits, *Lecture*.

**CAMS 305. Vergil**  
3 credits, *Lecture*.

**CAMS 306. Roman State**  
3 credits, *Lecture*.

**CAMS 307. Ovid and Elegiac Poets**  
3 credits, *Lecture*.

**CAMS 308. Lucretius**  
3 credits, *Lecture*.

**CAMS 309. Tacitus**  
3 credits, *Lecture*.

**CAMS 310. Cicero's Philosophical Works**  
3 credits, *Lecture*.

**CAMS 311. Later Latin**  
Authors from ca. 180 A.D. to and including Isidore of Seville (560-636).  
3 credits, *Lecture*.

**CAMS 312. Latin Epigraphy**  
Selected remains of Latin, from all periods, inscribed on durable materials.  
3 credits, *Lecture*.

**CAMS 313. Roman Comedy**  
3 credits, *Seminar*.

**CAMS 328. Advanced Latin Composition**  
3 credits, *Lecture*.

## French

**FREN 301. Seventeenth-Century Poetry**  
3 credits, *Lecture*.

**FREN 302. The Seventeenth-Century Theatre**  
3 credits, *Seminar*.

**FREN 303. The Novel in the Seventeenth Century**  
3 credits, *Lecture*.

**FREN 304. Seventeenth-Century French Thought**  
Religious and Libertin thinkers: Gassendi, Descartes; the Moralistes: Pascal, La Rochefoucauld, La Bruyère.  
3 credits, *Lecture*.

**FREN 305. The First Two Generations of the French Enlightenment**  
3 credits, *Lecture*.

**FREN 306. The Later French Enlightenment**  
3 credits, *Lecture*.

**FREN 307. Problems in French Literature or Philology**  
1 – 3 credits, *Lecture*.

**FREN 308. Old French Paleography and Textual Edition**  
3 credits, *Lecture*. Prerequisite: FREN 352.

**FREN 309. Provençal Language and Literature**  
3 credits, *Lecture*.

**FREN 310. Introduction to French Philology**  
3 credits, *Lecture*.

**FREN 311. Aesthetic Trends in Twentieth-Century French Literature**  
3 credits, *Seminar*.

**FREN 351. French Historical Grammar**  
3 credits, *Lecture*.

**FREN 352. Old French Language**  
3 credits, *Lecture*.

**FREN 353. Old French Literature**  
3 credits, *Lecture*.

**FREN 357. The French Novel in the Eighteenth Century**  
3 credits, *Lecture*.

**FREN 359. Romantic Poetry and Drama**  
3 credits, *Lecture*.

**FREN 361. French Poetry in the Second Half of the Nineteenth Century**  
3 credits, *Seminar*.

**FREN 362. French Contemporary Poetry**  
3 credits, *Seminar*.

**FREN 366. French Contemporary Drama**  
3 credits, *Lecture*.

**FREN 369. The French Novel in the First Half of the Nineteenth Century**  
Stendhal, Balzac, and the romantic novelists.  
3 credits, *Seminar*.

**FREN 370. The French Novel in the Second Half of the Nineteenth Century**  
Flaubert, Zola, and their contemporaries.  
3 credits, *Lecture*.

**FREN 373. The French Contemporary Novel**  
3 credits, *Seminar*.

**FREN 376. The Prose of the French Renaissance**  
3 credits, *Seminar*.

**FREN 377. The Poetry of the French Renaissance**  
3 credits, *Lecture*.

**FREN 380. Seminar in Francophone Literature**  
The study of the literature from the French-speaking world outside of France (Quebec, the Antilles, West Africa, the Maghreb) against the background of colonial and post-colonial history. May be repeated for credit with change of topic.  
3 credits, *Seminar*.

**FREN 381. Study of French Style**  
Problems of French style and writing of critical papers.  
3 credits, *Lecture*.

**FREN 400. Seminar on Chretien de Troyes**  
3 credits, *Lecture*. Prerequisite: FREN 353.

**FREN 401. Seminar on Villon**  
3 credits, *Lecture*. Prerequisite: FREN 353.

## German

**GERM 305. Studies in Germanic Philology and Linguistics**  
Study of a coherent body of material related to older Germanic languages; to diachronic or synchronic phonology, morphology, syntax, and lexicology of Germanic languages; or to other areas of theoretical or applied linguistics.  
3 credits, *Seminar*.

**GERM 306. Topics in Germanic Philology and Linguistics**  
Focus on a specific topic, problem, controversy, research methodology, etc. in Germanic philology and linguistics.  
1 credit, *Seminar*.

**GERM 314. German Studies**  
Exploration of the field of German Studies as an “interdiscipline”; analysis of a coherent body of material drawn from the social sciences,

humanities, natural sciences, or other fields that helps to illuminate the German-speaking world.  
3 credits, *Seminar*.

**GERM 315. Topics in German Studies**  
Focus on a particular theme (e.g. “revolution,” or “family and society”), approach (e.g. critical theory, or feminist interpretations), genre (e.g. lyric, or autobiographical essay), skill (e.g. research methodology) or other aspect of German studies.  
1 credit, *Seminar*.

**GERM 322. Studies in German Literature I**  
Study of a coherent body of texts drawn from the period from the beginnings of German literature to approximately 1700.  
3 credits, *Seminar*.

**GERM 332. Studies in German Literature II**  
Study of a coherent body of texts drawn from the period from approximately 1700 to 1890.  
3 credits, *Seminar*.

**GERM 345. Studies in German Literature III**  
Study of a coherent body of texts drawn from the period from approximately 1890 to the present.  
3 credits, *Seminar*.

**GERM 360. Research Methodology**  
Introduction to the methods of literary research and bibliography.  
3 credits, *Seminar*.

**GERM 365. German Film Studies**  
Study of a coherent body of films and related materials (e.g. fiction, theory, reviews) organized to illuminate particular themes (e.g. representations of postwar Germany), relationships (e.g. between films and literature or film and social context), cinematic styles (e.g. Expressionism), etc.  
3 credits, *Seminar*.

**GERM 367. Topics in German Film Studies**  
Focus on a particular film, filmmaker, film genre, controversy, etc.  
1 credit, *Seminar*.

**GERM 368. The German-Speaking World**  
Landeskunde of the German-speaking world. The physical geography as well as cultural heritage, traditions, and contemporary customs of Austria, Germany, Switzerland, and other German-speaking regions of the world.  
3 credits, *Lecture*

**GERM 369. Topics in Landeskunde of the German-Speaking World**  
Focus on a specific topic or problem related to diachronic or contemporary Landeskunde of Austria, Germany, Switzerland, or another German-speaking region of the world.  
1 credit, *Seminar*.



**GERM 375. Advanced Conversation and Composition**

Practice in oral and written expression, with an emphasis on current idiomatic usage, grammatical structure, and stylistics  
3 credits, *Lecture*.

**GERM 376. Rhetoric and Writing**

In-depth introduction to the rhetorical resources of the German language; extensive analysis of spoken and written language; application of knowledge in students' own writing and speaking.  
3 credits, *Seminar*.

**GERM 377. Topics in Rhetoric and Writing**

1 credit, *Seminar*.

**GERM 378. Preparation for Certification of Proficiency in German**

Development of students' proficiency in speaking, listening, reading and writing German in preparation for either the *Mittelstufenprüfung* or *Oberstufenprüfung*.  
0 credits, *Lecture*

**GERM 380. German Language Methodology**

Exploration and analysis of a range of theories, issues, and problems in German instruction. Focus on the nature of language acquisition, methods, and implications for practice.  
3 credits, *Lecture*.

**GERM 381. Topics in German Language Methodology**

Focus on such special areas as content-based instruction, language for specific purposes (LSP), instructional technologies, development of teaching materials, proficiency, testing techniques, etc.  
1 credit, *Seminar*.

**GERM 385. German Literary Criticism and Theory**

Systematic study of literary criticism, including such topics as the contributions of particular critical approaches to the understanding of significant German-language literary works; the philosophies, implicit or explicit, underlying various critical approaches; and the German contribution to international critical discourse.  
3 credits, *Seminar*.

**GERM 388. Topics in German Literature**

Focus on a specific topic, problem, controversy, methodology, etc. in German literature studies or criticism.  
1 credit, *Seminar*.

**GERM 390. Independent Study**

1 – 6 credits, *Independent Study*.

**GERM 395. Capstone in German Studies and Language Methodology**

Review and synthesis of material studied and skills acquired; design and implementation, in

close consultation with graduate faculty, of a capstone project.

1 credit, *Seminar*.

**GERM 410. Seminar in Germanic Philology and Linguistics**

3 credits, *Lecture*.

**GERM 420. Seminar in Medieval Literature**

3 credits, *Seminar*.

**GERM 430. Seminar in Sixteenth- and Seventeenth-Century Literature**

3 credits, *Seminar*.

**GERM 440. Seminar in Eighteenth-Century Literature**

3 credits, *Seminar*.

**GERM 450. Seminar in Nineteenth-Century Literature**

3 credits, *Seminar*.

**GERM 460. Seminar in Twentieth-Century Literature**

3 credits, *Seminar*.

**GERM 465. New Forms of the German Novel in the Twentieth Century from Rilke to Handke**

Innovations in representative novels of the twentieth century, such as Malte Laurids Brigge, Schlafwandler, Mann ohne Eigenschaften, Stiller, Blechtrommel, Der Prozess, and Der lange Brief zum kurzen Abschied.  
3 credits, *Lecture*.

**GERM 480. Investigation of Special Topics**

1 – 6 credits, *Lecture*.

**Hebrew****HEB 301. Hebrew Wisdom Literature**

Systematic examination of classical wisdom texts in the Hebrew Bible and Rabbinic Literature focusing on their contribution to world ethical literature. Taught in English.  
3 credits, *Seminar*.

**HEB 303. Religion of Ancient Israel**

Significant aspects of the religion of ancient Israel: The God-human relationship, the origins of good and evil, law and covenant, kingship, prophecy, ritual and morality, repentance and redemption. Taught in English.  
3 credits, *Lecture*.

**HEB 311. History and Literature of Talmudic Palestine**

A discussion of select topics and texts pertaining to religious, social, and political currents in Talmudic Palestine. Taught in English.  
3 credits, *Seminar*.

**HEB 390. Independent Study**

3 credits, *Independent Study*. Instructor consent required.

**HEB 397. Special Topics**

Investigation of special topics in Hebrew literature and civilization.  
3 credits, *Seminar*. Instructor consent required.

**Italian****ILCS 315. Introduction to Contemporary Literary Studies**

Contemporary methods and fields of literary analysis. Paradigms of literary studies and overview of Marxist, Freudian, Feminist, Historicist, and Culturalist criticism.  
3 credits, *Lecture*.

**ILCS 330. The Literature of the Origins**

Poets and poetical schools of the Duecento from the Franciscans to the Sicilians and the "Dolce stil nuovo."  
3 credits, *Lecture*.

**ILCS 331. Seminar on Early Religious Literature**

From St. Francis to the Fioretti. The Franciscan and mystical tradition, hagiographic folklore (Passavanti, Cavalca), St. Catherine and early religious humanism.  
3 credits, *Lecture*.

**ILCS 332. Seminar on Petrarch**

The works of Francesco Petrarca; their relevance to humanism and to subsequent European lyrical poetry.  
3 credits, *Seminar*.

**ILCS 333. Seminar on Boccaccio**

The Italian lyrics and narrative poems, the Decameron and its seminal importance for prose fiction, the scholarly Italian and Latin works.  
3 credits, *Seminar*.

**ILCS 334. Seminar on Machiavelli**

The principal objective of this course is twofold: 1) to analyze and assess the political thought and the theater of Machiavelli as represented, respectively, in the Prince and the Discourses, and in the comedies Mandragola and Clizia and in the Favola (Belfagor arcidiavolo); and 2) to discuss Machiavelli's influence beyond Italy (e.g., on authors such as Christopher Marlowe, Shakespeare, Ben Jonson, and Francis Bacon). Special attention will be given to Machiavelli's unique relation to Renaissance Humanism, to his unconventional concept of virtue and his redefinition of the ethics of politics, and to his view of the statesman as artist.  
3 credits, *Seminar*.

**ILCS 335. Baroque Literature**  
The beginnings of baroque literary style and its ramifications in the seventeenth century.  
*3 credits, Lecture.*

**ILCS 337. Theories and Methods of Modern Criticism I**  
Aesthetic problems from Vico to the present day.  
*3 credits, Lecture.*

**ILCS 338. Theories and Methods of Modern Criticism II**  
Modern semiotics, textual and historical criticism, stylistics.  
*3 credits, Lecture.*

**ILCS 339. Seminar on Modern Literature**  
One leading writer from the last two centuries.  
*3 credits, Seminar.*

**ILCS 340. Divina Commedia**  
*3 credits, Seminar.*

**ILCS 341. Dante: Minor Works**  
The Vita Nuova and the Rime. The doctrinal treatises (De Vulgari Eloquentia, Convivio, De Monarchia.)  
*3 credits, Seminar.*

**ILCS 342. Seminar on Italian Theatre from Renaissance to Romanticism**  
Major figures and developments from Poliziano and Machiavelli to Goldoni, Alfieri and Manzoni.  
*3 credits, Lecture.*

**ILCS 345. Studies in Italian Literature or Philology**  
*1 – 6 credits, Lecture.*

**ILCS 346. Italian Literature of the Quattrocento**  
The literary and philosophical currents of Renaissance humanism.  
*3 credits, Lecture.*

**ILCS 347. Italian Chivalric Poetry**  
*3 credits, Lecture.*

**ILCS 348. Literature of the Cinquecento I**  
Acme and wane of the Renaissance in the sixteenth century. Prose of Machiavelli, Guicciardini, Castiglione, Cellini, Vasari, and Bandello.  
*3 credits, Lecture.*

**ILCS 349. Literature of the Cinquecento II**  
Acme and wane of the Renaissance in the sixteenth century. Poetry of Bembo and the Petrarchists, Michelangelo's lyrics, Della Casa, Ariosto's minor works, Tasso's verse and drama, and the rise of Aristotelian criticism.  
*3 credits, Lecture.*

**ILCS 350. Literature of the Settecento**  
Major figures of the eighteenth century enlightenment. Vico, Alfieri, Goldoni, Parini.  
*3 credits, Lecture.*

**ILCS 351. Literature of Romanticism**  
Neoclassicists versus innovators: Monti, Foscolo, Leopardi, Berchet, Manzoni, De Sanctis.  
*3 credits, Lecture.*

**ILCS 352. Modern Italian Poetry I**  
Post-romantic masters through the twentieth century experiments: e.g., the Crepuscolari, Futurists, Hermeticists.  
*3 credits, Lecture.*

**ILCS 353. Modern Italian Poetry II**  
Post-romantic masters through the twentieth century experiments: e.g., the Crepuscolari, Futurists, Hermeticists.  
*3 credits, Lecture.*

**ILCS 354. Masters of Twentieth-Century Fiction**  
Pirandello, Svevo, Moravia, Pavese, Vittorini.  
*3 credits, Lecture.*

**ILCS 355. Introduction to Italian Philology**  
Italian linguistic geography, neo-linguistics of Bartoli, areal linguistics, Dante's De Vulgari Eloquentia, the "Questione della lingua." Croce's theory of language.  
*3 credits, Lecture.*

**ILCS 359. Modern Drama**  
Major figures from D'Annunzio to Pirandello, Betti, and present-day playwrights.  
*3 credits, Lecture.*

**Portuguese**

**PORT 301. Studies in Portuguese and Brazilian Literature**  
The major poets, novelists, dramatists, and essayists from Portugal and Brazil.  
*3 credits, Seminar.*

**Romance Languages**

**ROML 395. Applied Linguistics for Teachers of Romance Languages**  
*3 credits, Seminar.*

**Spanish**

**SPAN 320. Independent Study**  
*1 – 6 credits, Independent Study.*

**SPAN 321. Theatre of the Golden Age**  
A study of the origin, formation and development of the Spanish comedia. Representative works of

Lope de Vega, Calderón, Tirso de Molina, and Alarcón will be analyzed with special emphasis on individual characteristics.  
*3 credits, Lecture.*

**SPAN 322. History of the Spanish Language**  
The development of Castilian and its relation to its congeners in the Iberian Peninsula and Hispanic America.  
*3 credits, Seminar.*

**SPAN 323. Concepts of Literary Criticism**  
A practical approach to the theories and methods of literary criticism with particular reference to Hispanic literature.  
*3 credits, Seminar.*

**SPAN 325. Cervantes**  
A study of the life and works of Cervantes with special emphasis on Don Quixote.  
*3 credits, Lecture.*

**SPAN 328. Medieval Spanish Literature (1100-1350)**  
Major works in prose and poetry from 1100-1350 in medieval Iberia.  
*3 credits, Lecture.*

**SPAN 329. Medieval Spanish Literature (1350-1500)**  
Major works in prose and poetry written in Spain from 1350-1500.  
*3 credits, Lecture.*

**SPAN 332. Spanish Poetry of the Renaissance**  
Analysis of the currents of Spanish poetry from Bosc n to Fray Luis de León.  
*3 credits, Seminar.*

**SPAN 333. Spanish Poetry of the Golden Age**  
Analysis of the currents of Spanish poetry from Cervantes to Calderón.  
*3 credits, Lecture.*

**SPAN 334. Modern Spanish-American Poetry**  
Selected poets and movements in Spanish America from the late nineteenth century to the present.  
*3 credits, Seminar.*

**SPAN 335. The Theatre in Spanish America**  
The works of selected dramatists, with emphasis on the modern period.  
*3 credits, Lecture.*

**SPAN 336. Colonial Latin American Literature**  
Study of particular aspects of colonial literary production: religious and secular historiography; humanist thought in the colonies, poetry, and society; literature and the Baroque city; political and scientific thought.  
*3 credits, Lecture.*

**SPAN 350. The Essay in Spanish America**  
The Spanish-American essay as a literary genre and a vehicle of ideas. Reading in the works of

the chief essayists of the Spanish-American nations.

3 credits, Seminar.

**SPAN 351. The Novel in Spanish America**

The development of the genre in Spanish America and selected readings in the works of its chief exponents.

3 credits, Seminar.

**SPAN 354. Nineteenth-Century Poetry and Drama**

Study of the poetry and drama of the nineteenth century with special emphasis on romantic poetry and post-romantic drama.

3 credits, Lecture.

**SPAN 355. The Nineteenth-Century Spanish Novel and Essay**

A study of the essays of Larra and Ganivet, as well as the nineteenth-century novel. Special emphasis will be placed on the post-romantic novel.

3 credits, Seminar.

**SPAN 356. Twentieth-Century Novel and Essay**

Selected works either of authors from 1895 to 1936, or of authors from 1936 to the present.

3 credits, Seminar.

**SPAN 357. Twentieth-Century Drama and Poetry**

Selected works and authors from 1900 to the present.

3 credits, Seminar.

**SPAN 358. Prose of the Renaissance**

Principal aesthetic and ideological currents. The novel and works of the mystic and ascetic writers.

3 credits, Lecture.

**SPAN 359. Prose of the Golden Age**

The picaresque novel and the chief works of Quevedo, Gracián and Saavedra Fajardo.

3 credits, Lecture.

**SPAN 400. Seminar on Lope de Vega**

A study of the life and works of Lope de Vega with special emphasis on his comedias.

3 credits, Seminar.

**SPAN 402. Studies in Spanish-American Literature**

3 credits, Lecture.

**SPAN 403. Studies in Spanish**

3 credits, Lecture.

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## All Master's and Doctoral Fields

†GRAD 395. Master's Thesis Research

1 - 9 credits.

†GRAD 396. Full-Time Master's Research

3 credits.

†GRAD 397. Full-Time Directed Studies

(Master's Level)

3 credits.

GRAD 398. Special Readings (Master's)

Non-credit.

GRAD 399. Thesis Preparation

Non-credit.

†GRAD 495. Doctoral Dissertation Research

1 - 9 credits.

†GRAD 496. Full-Time Doctoral Research

3 credits.

†GRAD 497. Full-Time Directed Studies

(Doctoral Level)

3 credits.

GRAD 498. Special Readings (Doctoral)

Non-credit.

GRAD 499. Dissertation Preparation

Non-credit.

## MUSIC

*Department Head:* Professor Robert Miller

*Professors:* Arm, Bagley, Bass, Frogley, Stanley, and Stephens

*Associate Professors:* Isaacson, Kaminsky, Larrabee, McClain, Mills, Renshaw, and Sacco

*Assistant Professor:* Ackley, Neelly, Robinson, and Squibbs

**The Master's Program.** Areas of concentration leading to the Master of Music degree are music education and performance (including an area of emphasis in conducting). Areas of concentration leading to the Master of Arts degree are historical musicology and theory.

Admission requirements in addition to those of the Graduate School are as follows: Applicants in historical musicology and theory are required to submit a writing sample, and Graduate Record Examination scores (General Test). All other applicants must submit GRE Revised Music Test scores or the University of Connecticut Graduate Theory Placement Exam. Applicants in performance, conducting, and music education are required to audition for admission. While a personal audition is preferred, a recorded audition may be submitted by applicants who find it prohibitive to travel to Storrs. In lieu of an audition, music education applicants may substitute a video recording of their recent teaching that demonstrates the applicant's personal musicianship.

The master's degree programs require a minimum of 24 credits for the M.A. and 30 credits for the M. Mus. A thesis is required for the Master of Arts program. Students in performance or conducting must present a public recital, and a final project of a type approved by the music faculty.

**The D.M.A. Program.** Areas of Concentration in conducting (instrumental, choral) and performance are offered. The program includes applied study, a minor field in theory or history, and electives suited to the student's objectives and needs. For specific information with regard to admission to the D.M.A. program, students should write to the Director of Graduate Studies in Music, Department of Music, Unit 1012, Storrs, Connecticut 06269-1012.

**The Ph.D. Program.** Areas of concentration are music theory and history, and music education. Plans of study are constructed through consultation between the student and advisory committee, so that the program is uniquely suited to the student's objectives and needs. For specific information with regard to admission to the Ph.D. program, students should write to the Director of Graduate Studies in Music, Department of Music, Unit 1012, Storrs, Connecticut 06269-1012.

**Graduate Performer's Certificate.** For information concerning the Graduate Performer's Certificate, write to the Department of Music, Unit 1012, Storrs, Connecticut 06269-1012.

**Special Facilities.** The Frank B. Cookson Music Library maintains an extensive collection of books, scores, and recordings. Listening facilities



are available to students in the library. Unique research facilities include the department computer laboratory, the electronic music studio, the music education laboratory, and an extensive collection of Renaissance and Baroque instruments and replicas. The von der Mehden Recital Hall, seating 500, is used for student and faculty performances and houses digital recording facilities. A concert hall seating 3,000 provides a full season of concerts, including performances by major symphony orchestras, chamber musicians and internationally known solo artists.

## COURSES OF STUDY

### **MUSI 300. Investigation of Special Topics**

1–3 credits, *Independent Study. Instructor consent required. Open to graduate students in Music, others with permission.*

### **MUSI 301. Research Procedures in Music Education**

Research methods and sources.  
3 credits, *Lecture.*

### **MUSI 302. Analytic Techniques**

Structure and style in works from the 18th through the 20th Centuries.  
3 credits, *Lecture.*

### **MUSI 305. Graduate Performing Ensemble**

Symphony Orchestra, Symphonic Wind Ensemble, Concert Band, Concert Choir, Chamber Singers, University Chorale, Voices of Freedom Gospel Choir, Jazz Ensemble, Jazz Lab Band.  
1 credit, *Laboratory. Open to graduate students in Music, others with permission.*

### **MUSI 306. Seminar in Opera Literature**

Literature of the opera from the Early Baroque to the present. Course content can change from a general survey to a study of selected works by a composer, or works in a specific country or style period.  
3 credits, *Seminar. Open to graduate students in Music, others with permission.*

### **MUSI 307. Seminar in Keyboard Literature**

Stylistic and performance problems in keyboard literature through Mozart. Course for advanced pianists.  
3 credits, *Lecture. Open to graduate students in Music, others with permission.*

### **MUSI 308. Seminar in Piano Literature**

Stylistic and performance problems in piano literature from Beethoven. Course for advanced pianists.  
3 credits, *Lecture. Open to graduate students in Music, others with permission.*

### **MUSI 309. Seminar in Woodwind Literature**

Historical development of the woodwind instruments; of representative solo and ensemble

literature.

3 credits, *Seminar. Open to graduate students in Music, others with permission.*

### **MUSI 315. Seminar in Suzuki String Pedagogy**

Philosophy, repertoire and pedagogy of the Suzuki Method, including guided observation and supervised teaching.  
2 credits, *Seminar. Open to graduate students in Music, others with permission.*

### **MUSI 319. Notation and Performance Practice**

Notation, ornamentation, and instrumentation from the middle ages through the classic period.  
3 credits, *Lecture. Open to graduate students in Music, others with permission.*

### **MUSI 322. Experimental Research in Music**

Investigation of the problems and techniques employed in experimental studies of music.  
3 credits, *Lecture. Open to graduate students in Music, others with permission.*

### **MUSI 323. Applied Music**

1–6 credits, *Practicum. Instructor consent required. Open to graduate students in Music, others with permission.*

### **MUSI 324. Graduate Chamber Ensemble**

Study and performance of chamber music for various ensembles.  
1 credit, *Laboratory. Open to graduate students in Music, others with permission.*

### **MUSI 325. Opera Theater**

Study and performance of roles in major opera productions and/or work in production technique.  
1 credit, *Lecture. Open to graduate students in Music, others with permission. May be repeated for credit.*

### **MUSI 330. Advanced Instrumental Conducting**

Score study, conducting, and rehearsal techniques of selected instrumental literature.  
2 credits, *Laboratory. Open to graduate students in Music, others with permission.*

### **MUSI 331. Conducting Seminar**

Special topics in instrumental and choral conducting.  
1 credit, *Seminar.*

### **MUSI 332. Psychology of Music**

Psychoacoustical problems related to musical performance, composition, and appreciation.  
3 credits, *Lecture. Open to graduate students in Music, others with permission.*

### **MUSI 333. Foundations and Principles of Music Education**

Historical, sociological and philosophical foundations of music education in American elementary and secondary schools.  
3 credits, *Lecture.*

### **MUSI 340. Musical Skills for Teachers**

Aural, sight-singing and keyboard skills for public school music teachers.  
2 credits, *Lecture. Open to graduate students in Music, others with permission.*

### **MUSI 348. Schenkerian Theory and Analysis**

Readings and analytical projects based on the theories of Heinrich Schenker and his followers.  
3 credits, *Lecture. Open to graduate students in Music, others with permission. Prerequisite: MUSI 302.*

### **MUSI 353. Theory Seminar**

Analysis of specific styles and the work of particular theorists: variable topics.  
3 credits, *Seminar. Open to graduate students in Music, others with permission. Prerequisite: MUSI 302.*

### **MUSI 354. Advanced Analysis**

Methods and models of music analysis applied to selected works from the Middle Ages to the 20th Century.  
3 credits, *Lecture. Open to graduate students in Music, others with permission. Prerequisite: MUSI 302.*

### **MUSI 356. Theory Teaching**

New teaching strategies. Emphasis on aural training.  
3 credits, *Lecture. Open to graduate students in Music, others with permission.*

### **MUSI 357. Advanced Orchestration I**

Principles and techniques of scoring for the orchestra and band.  
3 credits, *Lecture. Open to graduate students in Music, others with permission.*

### **MUSI 358. Advanced Orchestration II**

Principles and techniques of scoring for the orchestra and band.  
3 credits, *Lecture. Open to graduate students in Music, others with permission.*

### **MUSI 359. History of Music Theory**

Speculative pedagogical and analytical thought on the music in theoretical treatises from antiquity to the twentieth century.  
3 credits, *Lecture. Prerequisite: MUSI 302.*

### **MUSI 364. Advanced Choral Techniques**

Score study, conducting, and rehearsal techniques of selected choral literature.  
2 credits, *Seminar. Open to graduate students in Music, others with permission.*

### **MUSI 365. Choral Literature to 1600**

Historical-analytical study of choral compositions: c. 1000 A.D. to 1600.  
2 credits, *Lecture. Open to graduate students in Music, others with permission.*

**MUSI 366. Choral Literature from 1600 to 1800**

Historical-analytical study of choral compositions: 1600 to 1800.

*2 credits, Lecture. Open to graduate students in Music, others with permission.*

**MUSI 367. Choral Literature from 1800 to Present**

Historical-analytical study of 1800 to the present.

*2 credits, Lecture. Open to graduate students in Music, others with permission.*

**MUSI 372. Wind Band Literature**

Historical-analytical study of music for wind ensemble and symphony band.

*3 credits, Lecture. Open to graduate students in Music, others with permission.*

**MUSI 373. Orchestra Literature**

Historical-analytical study of orchestral literature.

*3 credits, Lecture. Open to graduate students in Music, others with permission.*

**MUSI 379. Atonal Theory and Analysis**

Set theoretic concepts and operations in applied twentieth-century music.

*3 credits, Lecture.*

**MUSI 391. Procedures in Historical Research**

A project-oriented approach to bibliographic tools and research methods applicable to the historical study of music.

*3 credits, Lecture.*

**MUSI 397. Recital**

*1 credit, Laboratory.*

**†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

**†GRAD 396. Full-Time Master's Research**

*3 credits.*

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**MUSI 400. Tutorial in Music**

Concentrated individualized study and research.

*1 - 3 credits, Independent Study. Instructor consent required.*

**MUSI 411. Seminar: The Life and Works of Individual Composers**

*3 credits, Seminar. Open to graduate students in Music, others with permission.*

**MUSI 412. Seminar: Style Periods in Music History**

*3 credits, Seminar. Open to graduate students in Music, others with permission.*

**MUSI 413. Seminar: History of Musical Forms**

Sonata, concerto, madrigal, motet or other musical forms.

*3 credits, Seminar. Open to graduate students in Music, others with permission.*

**MUSI 491. Seminar: Advanced Research Procedures in Musicology**

Critical reading and original research in recent historical musicology.

*3 credits, Seminar. Open to graduate students in Music, others with permission.*

**MUSI 497. Topics in Music Education**

Principles and advanced methods in the teaching of music.

*1 - 3 credits, Lecture.*

**†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

**†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

## NATURAL RESOURCES

*Department Head:* Professor David B. Schroeder  
*Professor:* Miller

*Associate Professors:* Barclay, Civco, Clausen, Neumann, Warner, and Yang

*Assistant Professors:* Meyer and Ortega

The Department of Natural Resources Management and Engineering offers study leading to the Master of Science and Doctor of Philosophy degrees in Natural Resources: Land, Water, and Air.

**The M.S. Program.** The purpose of the program is to provide advanced study in one of the following specialty areas: atmospheric resources, earth resource information systems, fisheries management, water resources, and wildlife management. Both thesis (Plan A) and non-thesis (Plan B) options are available.

**The Ph.D. Program.** The purpose of the Ph.D. program is to educate scientists with a broad experience in natural resources and to prepare them to do independent research in one of the following specialties: air resources, earth resources, fisheries resources, water resources, and wildlife resources. The program requires at least 20 credits beyond the master's degree, exclusive of the related or supporting area. All Ph.D. candidates are required to take NRME 397 and NRME 401. Ordinarily, students enrolled in this program will have completed the master's degree. Students are required to have at least six credits of advanced work in a related or supporting area or have a competent reading knowledge of at least one foreign language appropriate to the general area of study. Candidates should be versed in natural resources management, science and technology, and analytical methods.

**Special Facilities.** The Department has state-of-the-art laboratories for atmospheric resources, aquatic resources, fisheries resources, terrestrial resources and the Laboratory for Earth Resources Information (LERIS). The Department also houses the Wildlife Conservation Research Center and the Connecticut Water Resources Institute. The Department manages the 4,000 hectare UConn Forest for teaching, research, and demonstration.

### COURSES OF STUDY

**NRME 325. Environmental Measurements and Instrumentation**

Principles that govern the selection and use of both field sensors and recording data systems for field research and environmental monitoring.

*3 credits, Lecture.*

**NRME 326. Water Transport in Soils**

Application of the principles of transport of water in soil for various physical properties of soils and fluids, initial conditions and boundary conditions. The differential equations describing the movement of energy and mass for both saturated and unsaturated flow conditions will be applied to soil evaporation and plant transpiration, infiltration and percolation of wetting fronts,

and movement of tracers and chemical constituents of water. Both uniform flow and preferential flow will be examined.  
*3 credits, Lecture.*

**NRME 328. Environmental Biophysics**

Gas laws and transport processes. Radiation environment. Momentum, heat, and mass transfer. Steady-state and transient energy balance. Microclimate of plants and animals. Physical and physiological interactions between plants/animals and their environment.  
*3 credits, Lecture.*

**NRME 350. Principles of Nonpoint Source Pollution**

An advanced investigation of sources, impacts, modeling and management of nonpoint sources of water pollution.  
*3 credits, Lecture.*

**NRME 352. GPS Surveying**

Theory and practice of global positioning system (GPS) surveying. Includes network design, control, geodetic coordinate systems, field collection of measurements, data processing, and interpretation of results.  
*3 credits, Lecture.*

**NRME 360. Advanced Fisheries Management**

Principles, practices, and current trends in fisheries science and management.  
*3 credits, Lecture.*

**NRME 377. Natural Resource Applications of Geographic Information Systems**

The principles and applications of computer-assisted spatial data analysis in natural resources management will be covered. Both hypothetical and actual case studies of the use of geographic information systems (GIS) to solve natural resource problems will be discussed. Raster- and vector-oriented, microcomputer-based GIS software will serve as the hands-on tools for students.  
*3 credits, Lecture.*

**NRME 378. Wildlife Ecology**

A discussion of the principles upon which wildlife conservation is based.  
*1 - 6 credits, Lecture.*

**NRME 381. Wildlife Management**

The application of ecological principles as practiced by natural resource agencies throughout North America.  
*1 - 6 credits, Lecture.*

**NRME 387. Geospatial Data Processing Techniques**

Research approaches and techniques in geospatial analysis, enabling students to pursue integrated research in earth resources data geoprocessing applications. A variety of computer-based tools, including remote sensing, geographic information systems (GIS), and

global positioning satellite (GPS), will be utilized in the acquisition, analysis, and presentation of digital earth resource data and information.  
*3 credits, Lecture.*

**NRME 392. Ecology of Fishes I**

Interrelationships of fishes and their environment.  
*3 credits, Lecture.*

**NRME 393. Ecology of Fishes II**

Interrelationships of fishes and their environment.  
*3 credits, Lecture.*

†**NRME 397. Graduate Seminar**

The mechanism of presenting and moderating a professional presentation. Topics include: presentation, organization, speaking skills, use of media technology, formulation of questions, and moderator activities.  
*1 credit, Seminar.*

†**GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

†**GRAD 396. Full-Time Master's Research**

*3 credits.*

†**GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**NRME 401. Research Methods in Natural Resources**

General research techniques, writing scientific articles and grant proposals, problem solving approaches, experimental design and modeling concepts, and research ethics.  
*3 credits, Lecture.*

**NRME 402. Independent Study**

*1 - 3 credits, Independent Study. Instructor consent required.*

**NRME 420. Micrometeorology I**

Study of basic processes of the atmospheric boundary layer including turbulent flow and the exchanges of heat, water vapor, and pollutants.  
*3 credits, Lecture. Instructor consent required.*

**NRME 421. Micrometeorology II**

Study of current literature on processes in the atmospheric boundary layer  
*3 credits, Lecture. Instructor consent required.*

**NRME 431. Small Watershed Modeling**

Mathematical modeling of hydrologic processes in small watersheds and aquatic systems. Solutions of mass balance and flow relationships.

Investigation of dynamic relationships among variables. Examples include: infiltration, overland flow, channel routing, chemical transport and transformations, surface-subsurface interactions and biotic growth and degradation.  
*3 credits, Lecture.*

**NRME 432. Environmental Data Analysis**

Advanced topics on natural resources and environmental data analysis, including descriptive statistics, linear and nonlinear modeling of data, nonstationary time series, wavelet analysis, factor analysis, error of detection limits, and quality assurance.  
*3 credits, Lecture.*

**NRME 461. Landscape Ecology**

Interdisciplinary focus on the effect of landscape pattern on environmental processes and conditions and the influence of disturbance and underlying geomorphology on landscape pattern. Consideration of landscape ecology principles in planning and management of pattern and processes in which conservation and production land uses are intermingled.  
*3 credits, Lecture.*

**NRME 490. Natural Resources Colloquium**

Study and discussion of readings (journal articles, books, current research) on a selected topic in natural resources.  
*1 - 6 credits, Seminar.*

**NRME 491. Natural Resources Seminar**

Active participation in weekly natural resources seminars given by invited speakers.  
*1 credit, Seminar.*

**NRME 492. Special Topics in Natural Resources**

Advanced topics in the field of natural resources. Topics and credits to be published prior to the registration period preceding the semester offerings.  
*1 - 3 credits, Lecture. Instructor consent required.*

**NRME 498. Special Topics in Natural Resources**

Advanced topics in the field of natural resources.  
*1 - 3 credits, Lecture. Instructor consent required.*

†**GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

†**GRAD 496. Full-Time Doctoral Research**

*3 credits.*

†**GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*



## NURSING

*Dean:* Professor Laura C. Dzurec

*Professors:* Beck, Chinn, Cusson, and Koerner

*Associate Professors:* D'Avanzo, Hegedus, McDonald, Neafsey, Polifroni, and Thomas

*Assistant Professors:* Anderson, Brewer, Daisy, Engler, and Kenefick

*Adjunct Associate Professor:* Drew

The School of Nursing offers study leading to the Master of Science and Doctor of Philosophy degrees in nursing.

**The M.S. Program.** The plan of study includes nursing and supportive courses planned cooperatively by the advisory committee and the student. The program is accredited by the National League for Nursing.

The purpose of the master's program is to prepare advanced practice nurses with specialized knowledge, skills, and values. Graduates assume leadership roles in the health care system and advance practice and the discipline of nursing by applying existing nursing knowledge and using a spirit of inquiry to examine and test nursing knowledge. Specialty areas include the following: community health, acute care, neonatal, patient care service system administration, and primary care. Opportunity exists for dual degrees resulting in an M.P.H. and M.S. in Nursing for those students in the community health track. A dual degree option is also available for students resulting in an M.B.A. and M.S. in Nursing. Each student completes a 13-credit core curriculum in theory, research, and legal, regulatory and policy aspects of advanced nursing practice. A minimum of 12 credits is required in the area of emphasis. Additional courses supportive to the core or selected area of emphasis are mutually agreed upon by the student and the three member advisory committee. An accelerated master's program is available for nurses with diplomas, or associate's degrees. No student may take more than six (6) credits as a non-degree student. Both thesis (Plan A) and non-thesis (Plan B) options are available.

**Admission Requirements for the M.S. Program.** In addition to those of the Graduate School, requirements for admission are: a baccalaureate in nursing, successful completion of an undergraduate statistics course, current nurse licensure in Connecticut, skills in health assessment, and an admission interview. Nursing liability insurance, evidence of tetanus immunization within the past ten years, one poliomyelitis booster following initial immunization, PPD test (chest x-ray required biennially for positive reactors), rubella, rubeola, hepatitis B titers (with vaccine if titer is negative). A varicella titer is also required.

**The Ph.D. Program.** The purpose of the Ph.D. Program is to prepare nurse leaders who will advance the scientific body of knowledge that is unique to professional nursing practice. Educational experiences are offered in nursing theory

development, philosophy of nursing science, qualitative and quantitative research methods, and in advanced statistics. Study in specialty areas further supports the individual's area of clinical interest.

**Admission Requirements for the Ph.D. Program.** In addition to those of the Graduate School, requirements for admission are: graduation from a National League for Nursing accredited master's program in Nursing; eligibility for licensure as a registered nurse in Connecticut; a cumulative master's grade point average of 3.25 or higher; submission of Graduate Record Examination scores; completion of a graduate level inferential statistics course; three reference letters; a personal statement; a personal interview; and submission of published works or scholarly papers. Additional information may be obtained by contacting the School of Nursing Academic Advisory Center, 231 Glenbrook Road, Unit 2026, Storrs, Connecticut 06269-2026.

### COURSES OF STUDY

**NURS 300. Investigation of Special Topics**  
1 – 6 credits, Lecture. Instructor consent required.

**NURS 308. Principles of Epidemiology**  
Exploration of factors underlying the distribution and determinants of states of health in various human populations. Emphasis is placed on investigative techniques, epidemiological methodology, and disease prevention within the framework of nursing and health care.  
3 credits, Lecture. Prerequisite: EPSY 309 or NURS 358 or OPIM 303, any of which may be taken concurrently.

**NURS 309. Transcultural Health Care**  
Course designed to provide opportunities to investigate health care issues in a developing country. Learner will gain insight into the structural and sociocultural influences on health care with a community focus. Knowledge gained will serve as the basis for provision of cross-cultural health care in a variety of health care delivery settings.  
3 credits, Lecture.

**NURS 311. Pharmacotherapeutics and Implications for Nursing Action**  
Emphasis is placed on pharmacodynamics, on nursing measures that support desired drug responses or reduce side effects which must be tolerated, and on client teaching indicated by pharmacotherapy.  
3 credits, Lecture. Prerequisite: Either NURS 322 or NURS 329. Open to non-degree students.

**NURS 313. Theory and Practice in Neonatal Nursing I**  
Focus on the assessment of cognitive, psychomotor, psychosocial and physiological development of the neonate. Emphasis on application of theory and assessment skills in caring for high-

risk maternal-fetal unit, neonates, and family-infant unit. Knowledge obtained from human fetal development is applied.  
4 credits, Lecture. Prerequisite: NURS 322, which may be taken concurrently.

**NURS 314. Theory and Practice in Neonatal Nursing II**  
Focuses on the acquisition and application of in-depth physiological and psychosocial knowledge to the nursing care of high risk maternal-fetal unit, neonates, and their families. Emphasis is placed on the role of advanced practice in nursing management of high risk neonatal and perinatal populations.  
4 credits, Lecture. Prerequisite: NURS 313.

**NURS 315. Theory and Practice in Neonatal Nursing III**  
Focuses on the components essential for preparation of the student for advanced practice in neonatal/perinatal nursing.  
4 credits, Lecture. Prerequisite: NURS 314.

**NURS 322. Basis of Human Reproduction**  
Theories and concepts relevant to the human reproduction cycle which serve as a basis for nursing care of families. Human embryology and inheritance patterns of disease will be explored. Discussion of implications for nursing practice and research.  
3 credits, Lecture.

**NURS 323. Advanced Physical Diagnosis**  
The diagnosis of patients with acute health problems with a focus on data collection through history, physical examination, laboratory, radiology, and electronic and hemodynamic monitoring.  
3 credits, Lecture. Instructor consent required. Prerequisite: NURS 384.

**NURS 325. Advanced Practice: Acute Care Nursing II**  
This course continues to refine the analysis and application of theories for the nurse practitioner and clinical nurse specialist in acute care. The focus will be on role development, trends, issues and research into common problems of the acutely ill client.  
2 credits, Lecture. Prerequisite: NURS 360.

**NURS 329. Advanced Pathophysiologic Nursing Practice**  
Analysis of abnormal cellular, tissue, organ, and system function. Patients exhibiting objective and/or subjective clinical pathology will be compared to anticipated findings and outcomes. Open to nondegree students.  
4 credits, Lecture.

**NURS 334. Community Health Nursing Theory: Enhancing Wellness**  
Theoretical formulations from nursing, public health, and related sciences are used to enhance the levels of wellness of selected population

groups in the community. A needs assessment is conducted to develop a community diagnosis as the basis for developing a plan for health promotion.

*3 credits, Lecture. Prerequisite or co-requisite: Either NURS 308 or PUBH 401.*

**NURS 335. Community Health Nursing Theory and Practice: Risk Reduction**

Analysis of risk factors for selected populations/communities through an integration of nursing and public health theories. Opportunity for development, implementation, and evaluation of risk reduction interventions is provided.

*4 credits, Lecture. Prerequisite: NURS 334. Prerequisite or co-requisite: NURS 370.*

**NURS 336. Community Health Nursing Theory and Practice: Health Maintenance**

Analysis of health maintenance issues and interventions for groups sharing a common health problem. Opportunity to apply integrated knowledge of nursing and public health principles in the development and evaluation of plans to maintain optimum levels of health is provided.

*4 credits, Lecture. Prerequisite: NURS 335.*

**NURS 340. Health Care Outcome Management**

An examination and utilization of variance analysis and outcome measurement skills to achieve cost effective health care delivery through outcome management.

*2 credits, Lecture. Open to non-degree students.*

**NURS 350. Nursing Science**

Analysis of the current state of nursing science and the application of knowledge from this science and other disciplines to advanced nursing practice from historical, contemporary and futuristic perspectives.

*3 credits, Lecture. Open to non-degree students.*

**NURS 351. Nursing Research in Advanced Practice**

Analysis of qualitative and quantitative methods employed to answer questions in nursing practice. Emphasis on problem identification; design principles; and accessing, analyzing, disseminating and utilizing research.

*3 credits, Lecture. Prerequisites: EPSY 309 or NURS 358 and either NURS 213W or NURS 213.*

**NURS 352. Policy Aspects of Advanced Nursing Practice**

Analysis and evaluation of legal, regulatory, policy and economic aspects of advanced nursing practice from historical, contemporary and futuristic perspective. Understand the interrelationships among change, power and politics.

*3 credits, Lecture.*

**NURS 353. Seminar in Intradisciplinary Nursing**

A discussion of issues affecting advanced nursing practice.

*1 credit, Seminar. Co-requisite: a final practicum course, either NURS 315, NURS 325, NURS 336, NURS 379, NURS 388, or NURS 394.*

**NURS 354. Needs Assessment and Planning**

An interdisciplinary survey course that prepares students to conduct a needs assessment on a selected population. Includes elements of epidemiology, identification of populations at risk and the development of plans to market, implement and evaluate programs to enhance the health and well-being of selected populations.

*3 credits, Lecture. Prerequisites: EPSY 309 or NURS 358 and either NURS 213W or NURS 213.*

**NURS 356. Nursing Theories and Patterns of Knowing**

This survey course introduces the student to the art and science of nursing practice. It explores the historical, empirical, ethical, esthetical, and personal knowing aspects of nursing praxis. The legal, educational, regulatory, and financial world of nursing is examined. The major theorists influencing the development and advancement of the profession are explored.

*3 credits, Lecture. Instructor consent required.*

**NURS 358. Statistical Methods in Nursing**

Quantitative procedures including descriptive and inferential statistics, nonparametric approaches to data, and parametric analyses through factorial analysis of variance.

*3 credits, Lecture. Open to non-degree students.*

**NURS 360. Advanced Practice: Acute Care Nursing I**

The focus of this course will be the introduction of critical thinking, analysis and application of theories and concepts to care for acutely ill clients. A strong emphasis will be placed on pathophysiology and assessment. Interpretation and management of treatment plans will be explored.

*2 credits, Lecture. Prerequisites: NURS 311, NURS 323, NURS 329, and NURS 384.*

**NURS 361. Advanced Practice: Acute Care Nursing II**

Continues to refine the analysis and application of theories for the nurse practitioner and clinical nurse specialist in acute care. Focus is on role development, trends, issues and research into common problems of the acutely ill client.

*2 credits, Lecture.*

**NURS 363. Antecedents of Contemporary Clinical Nursing Practice**

Antecedents of contemporary clinical nursing practice are examined within the context of the then extant theories, practices and events. Students also have the opportunity to explore special interests related to the focus of the course.

*3 credits, Lecture. Open to non-degree students.*

**NURS 364. Seminar in Nursing History: Notable American Nurses**

This seminar is designed to explore the great man/woman theoretical approach to nursing history. In particular, the continuing debate over whether the presence of certain individuals or certain forces are the ultimate cause of historical events is examined. Students will explore the history of nursing in the United States through a biographical approach via written essays and presentations of their findings. It is expected that students will identify individual nurses who figured prominently in the development of nursing education or practice in their area of emphasis.

*3 credits, Seminar. Open to non-degree students.*

**NURS 365. Acute Care Nurse Practitioner Practicum I**

The focus of this practicum will be critical thinking, assessment and diagnosis of acutely/critically ill patients. Database creation, formulating a plan of care, and evaluation of outcomes will be explored. Diagnostics and therapeutics will be emphasized.

*4 credits, Lecture. Prerequisite: NURS 360.*

**NURS 366. Acute Care Nurse Practitioner Practicum II**

The focus of this practicum will be the refinement of pertinent management abilities and skill for the nurse practitioner student. The student will expand their management to multiple patients. Collaboration within a multidisciplinary team, providing holistic care and evaluation of current research will be explored.

*4 credits, Lecture. Prerequisite: NURS 365.*

**NURS 367. Acute Care Clinical Nurse Specialist Practicum I**

The focus of this course will be on assessment and implementation of care for acutely ill clients in perioperative, medical, surgical, critical care, and emergency department settings.

*2 credits, Lecture. Prerequisite: NURS 360.*

**NURS 368. Acute Care Clinical Nurse Specialist Practicum II**

The focus of this practicum will be on decision making and advanced nursing intervention strategies within various settings. Evaluation of care will be explored. Perioperative, medical, surgical, critical care, and emergency department clinical sites are available.

*2 credits, Lecture. Prerequisite: NURS 367.*

**NURS 370. Health Care Financing**

An analysis of economic theory as it relates to health care. Incorporation of expert support systems in the design of nursing department and unit financial plans. Compare and contrast various budgeting systems. Open to non-degree students.

*1 - 3 credits, Lecture.*

**NURS 371. Nursing Administration I**

Introduction to the process of nursing administration. Emphasis is placed on theories of leadership, motivation, evaluation, organizational design and problem solving.

*1 – 3 credits, Lecture. Instructor consent required.*

**NURS 372. Nursing Administration II**

Application of management theories to nursing administration focusing on staff development, labor relations, staffing and scheduling, patient classification systems, quality management, performance and program evaluation, and human resource management.

*1 – 4 credits, Lecture. Instructor consent required. Prerequisite: NURS 371. Co-requisite: NURS 351.*

**NURS 379. Nursing Administration III**

Synthesis of nursing and multidisciplinary theories in the system of nursing administration. Strategic planning, ethics, marketing, entre/intrapreneurship, and multisystem corporations are analyzed and the role of the administrator examined.

*1 – 5 credits, Lecture. Instructor consent required. Prerequisite: NURS 350, NURS 351, and NURS 372.*

**NURS 383. Primary Care I**

Focus is on the health promotion/disease prevention and the assessment and management of selected acute and chronic health problems, including respiratory, cardiovascular, and endocrine systems. Assessment skills applied to diagnosis and treatment of human responses to acute and chronic health problems are emphasized.

*3 credits, Lecture. Prerequisite: NURS 384.*

**NURS 384. Advanced Health Assessment**

The clinical management of individuals experiencing common acute and chronic health problems, focusing on the cardiovascular and respiratory systems and mental health.

Principles and techniques of advanced physical assessment are emphasized.

*3 credits, Lecture. Prerequisite: Either NURS 322 or NURS 329, which may be taken concurrently.*

**NURS 385. Primary Care II**

Assessment and management of selected acute and chronic health problems, focusing on endocrine, gastrointestinal, integumentary and genitourinary systems, women's health and behavioral health.

*3 credits, Lecture. Prerequisite: NURS 383 and either NURS 384 or NURS 392.*

**NURS 386. Primary Care Practicum II**

Assessment and management of selected acute and chronic health problems, focusing on gastrointestinal, integumentary, genitourinary systems, women's health, and behavioral health. Includes a seminar and 12 clinical hours per week.

*4 credits, Lecture. Prerequisite: NURS 383 and NURS 384.*

**NURS 387. Primary Care III**

Special focus will be on assessment and management of adolescents and adults with acute and chronic health problems, including musculoskeletal, neurological, immunological, sensory, and oncological problems. Violence, ethics, and genetic counseling will be addressed. A grade of B or higher is required to receive endorsement for certification examination.

*3 credits, Lecture. Prerequisite: Grades of B or higher in NURS 385 and either NURS 386 or NURS 393.*

**NURS 388. Primary Care Practicum III**

Builds on all previous primary care didactic and practicum courses, focusing on clinical management of individuals experiencing acute and chronic health problems with special emphasis on musculoskeletal, neurological, immunological and sensory systems, oncology, violence, and ethics. Additional practice in an area of special interest is encouraged. Includes a seminar and 15 clinical hours per week. A grade of B or higher is required to receive endorsement for certification examination.

*5 credits, Lecture. Prerequisite: NURS 387, which may be taken concurrently.*

**NURS 389. Primary Care Practicum I**

Focus is health promotion/disease prevention and the clinical diagnosis and management of individuals experiencing common acute and chronic health problems of respiratory, cardiovascular, and endocrine systems. The role of the nurse in primary care is examined. Includes a seminar and 12 clinical hours per week.

*4 credits, Lecture. Prerequisites: NURS 329 and NURS 384. Co-requisite: NURS 383.*

**NURS 391. Physiology of Aging**

A review of current biological theories of aging. Emphasis will be placed on synthesis and analysis of current physiologic theories and their relationship to normative changes of aging, the atypical presentation of disease in older adults, and the implications of these changes in the assessment and management of health and illness in the older adult.

*2 credits, Lecture.*

**NURS 392. Practicum in Advanced Practice Gerontological Nursing I**

Focus is on health promotion/disease prevention and the clinical management of older adults experiencing common acute and chronic health problems of the respiratory, cardiovascular, and endocrine systems. Common clinical problems of older adults will be examined. Includes a seminar and 12 clinical hours per week.

*4 credits, Lecture. Prerequisite: NURS 384 and NURS 391. Co-requisite: NURS 383.*

**NURS 393. Practicum in Advanced Practice Gerontological Nursing II**

The clinical management of older adults experiencing common acute and chronic health problems, focusing on gastrointestinal, integumentary, genitourinary systems, women's health, and behavioral health. The examination of common clinical problems of older adults will continue. Includes seminar and 12 clinical hours per week.

*4 credits, Lecture. Prerequisite: A grade of B or higher in NURS 392. Co-requisite: NURS 385.*

**NURS 394. Practicum in Advanced Practice Gerontological Nursing III**

Builds on previous primary care didactic and practicum courses in advanced practice gerontological nursing. Special focus will be on the care of older clients with problems of the musculoskeletal, neurological, and immunological, and sensory systems. Additional topics will include family violence, regulation issues and ethics. Includes a seminar and 15 clinical hours per week. A grade of B or higher is required to receive endorsement for certification examination.

*5 credits, Practicum. Prerequisite: NURS 387, which may be taken concurrently.*

**NURS 396. Research Internship in Nursing**

The research internship will be completed under the mentorship of an experienced researcher.

The course will meet in seminar format to provide direction and support during the internship.

*1 – 3 credits, Seminar.*

**NURS 397. Independent Study**

*1 – 6 credits, Independent Study. Instructor consent required.*

**†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

**†GRAD 396. Full-Time Master's Research**

*3 credits.*

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**NURS 410. Philosophy of Science in Nursing**

A critical examination of the meanings, methods, and logical structure of science. Contemporary and historical views pertaining to the nature of truth, explanation, law, theory and methodology will be analyzed and compared. Examples drawn from nursing epistemology as well as that of other disciplines will be utilized to depict the presuppositions of modern science.

*3 credits, Lecture.*



**NURS 413. Constructing Nursing Theory**  
Integrates the student's experiential worldview into the construction of knowledge relevant to the evolving epistemology in nursing. Provides a forum for dialogue focused on the process of caring in the human health experience as informed by research and theoretical developments.

*3 credits, Lecture. Prerequisite: NURS 414.*

**NURS 414. Analysis of Contemporary Nursing Knowledge**

Methods of analysis and evaluation of the concepts and theories in nursing both grand and mid range.

*3 credits, Lecture. Prerequisite: NURS 410.*

**NURS 430. Qualitative Methodology in Nursing Inquiry**

The study of the relationship among philosophy, theory, and qualitative methodology within the human science of nursing. Techniques related to sampling, research design, data collection, and data analysis will be explored through a combination of lecture, class discussion and course assignments.

*3 credits, Lecture.*

**NURS 431. Quantitative Methodology Applied to Nursing**

Study and application of theories of sampling and probability testing to nursing research. Different approaches to research design, variable specification, data collection and analysis are explored within quantitative methods of scientific inquiry.

*3 credits, Lecture. Prerequisite EPSY 346.*

**NURS 432. Instrument Development in Nursing**

A study of the theories and methods of instrument development as applied to nursing. The basic psychometric properties to be assessed and built into a useful measure for clinical or research applications are explored.

*3 credits, Lecture. Prerequisite: EPSY 346.*

**NURS 434. Advanced Qualitative Methods**

This seminar is designed for students in nursing and other disciplines to achieve an advanced level of expertise in selected qualitative approaches. Expected course outcome is a completed qualitative project.

*3 credits, Lecture. Prerequisite: NURS 430.*

**NURS 435. Grantsmanship: The Pursuit of Scholarly Support**

A pragmatic exploration of the societal and professional realities of grantsmanship. Experiences are practical so as to enhance the development of skills needed to secure funding for scholarly research endeavors.

*3 credits, Lecture. Prerequisites: NURS 430 and NURS 431.*

†**GRAD 495. Doctoral Dissertation Research**  
*1 - 9 credits.*

†**GRAD 496. Full-Time Doctoral Research**  
*3 credits.*

†**GRAD 497. Full-Time Directed Studies (Doctoral Level)**  
*3 credits.*

**GRAD 498. Special Readings (Doctoral)**  
*Non-credit.*

**GRAD 499. Dissertation Preparation**  
*Non-credit.*

## NUTRITIONAL SCIENCES

*Department Head:* Professor Sung I. Koo  
*Professors:* Clark, Ferris, Freake, and Lammi-Keefe  
*Associate Professors:* Dzurec, Fernandez, McGrane, Perez-Escamilla, and Rodriguez

The degrees of Master of Science (Plan A thesis and Plan B non-thesis options) and Doctor of Philosophy in the field of Nutritional Science are offered.

**Admission to Degree Programs.** In addition to the standard requirements of the Graduate School, applicants also should submit scores from the Graduate Records Examinations (GRE). Prior study in the biological sciences and nutrition is required, however, some prerequisites may be taken after matriculation in the program. More detailed information can be obtained from the department.

**Program of Study.** There are four major areas of expertise within the Department: molecular nutrition, nutritional biochemistry and metabolism, community nutrition and health, and food science. Molecular nutrition is based on laboratory studies utilizing molecular biological techniques to examine mechanisms of nutrient action and metabolism in the cell, tissue, and whole animal. Nutritional biochemistry and metabolism involves human and animal studies to examine nutrient metabolism in health and disease. Community nutrition and health focuses on public health areas of nutrition including community-level nutrition assessment, education and intervention programs. Food science is an interdepartmental emphasis area and focuses on development and application of emerging food processing, preservation, and packaging technologies to improve food quality and safety. The first three areas are interdisciplinary in approach and are supported by other departments as well as by collaborative arrangements with other institutions. Opportunities for interdisciplinary research and study exist. All programs require a thesis, dissertation, or expanded paper, in addition to the successful completion of the appropriate graduate courses and examinations.

### COURSES OF STUDY

**NUSC 300. Macronutrient Metabolism**

The function and metabolic pathways of energy, carbohydrates, protein and lipids; their interrelationships and factors controlling their metabolism. Methodologies for studying metabolism and assessing nutrient requirements in man and animals.

*3 credits, Lecture. Prerequisite: MCB 301.*

†**NUSC 301. Concepts of Nutrition**

An introduction to the broad field of nutrition. Intended for entering graduate students, the course provides a conceptual framework for research and study in the nutritional sciences.

*2 credits, Lecture.*

**NUSC 312. Assessment of Nutritional Status**

This course is designed to discuss and critique the methodologies of nutritional status assessment, namely dietary, anthropometric and biochemical. Analysis of human blood and urine samples provides exposure to laboratory techniques and equipment used in nutritional assessment.

*3 credits, Lecture. Instructor consent required. Prerequisite: NUSC 300.*

**NUSC 313. Nutrition and Gene Expression**

Regulation of eukaryotic gene expression by specific nutrients, hormones, and metabolites. Transcriptional, post-transcriptional, and translational mechanisms.

*3 credits, Lecture. Prerequisite: MCB 301.*

**NUSC 314. Nutrition for Healthy Communities**

Development of knowledge and skill in public nutrition, including community assessment, development of program policies, and program planning, implementation, and evaluation.

*3 credits, Lecture. Instructor consent required.*

**NUSC 315. Lipid Metabolism in Health and Disease**

*3 credits, Lecture.*

**NUSC 317. Nutritional Epidemiology**

Principles and applications of nutritional epidemiology with emphasis on research design.

*3 credits, Lecture. Instructor consent required.*

**NUSC 332. Vitamins and Minerals**

Comprehensive study of vitamins, trace elements, and selected macrominerals, including biochemical function(s), metabolic pathways, interactions, and toxicities.

*3 credits, Lecture. Prerequisite: MCB 301.*

**NUSC 342. Special Topics in Nutrition**

Advanced study in a given area of nutritional science.

*1 - 6 credits, Lecture. Instructor consent required.*

**NUSC 365. Advanced Clinical Nutrition**

A study of topics of current clinical interest. Lectures, readings, reports and discussion.

*3 credits, Lecture. Instructor consent required. Prerequisite: NUSC 300.*

**NUSC 370. Field Work on Community Nutrition**

Supervised field studies of community nutrition problems and visits with community agencies and families. Readings, conferences and reports required.

*1 - 6 credits, Practicum.*

**NUSC 380. Independent Study in Nutritional Science**

Research problems or critical review of literature in any area of nutrition.

*1 - 6 credits, Independent Study. Instructor consent required.*

**NUSC 390. Seminar**

Students develop the skills required for the analysis and presentation of current literature and research problems.

*1 credit, Seminar. Prerequisite: NUSC 301.*

**†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

**†GRAD 396. Full-Time Master's Research**

*3 credits.*

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

**†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

## PATHOBIOLOGY

*Interim Department Head:* Professor Herbert J. Van Kruijningen

*Professors:* Geary and Hill

*Associate Professors:* Bushmich, French, Garmendia, and Khan

*Assistant Professors:* De Guise and Frasca

*Adjunct Professor:* Andreadis

*Adjunct Associate Professor:* Tsongalis

*Adjunct Assistant Professors:* Baxt, Golde, Grubman, Rodriguez, and Sunila,

Graduate instruction leading to the M.S. and Ph.D. degrees is offered by the Department of Pathobiology and Veterinary Science. All M.S. degrees are granted in Pathobiology. Ph.D. degrees are granted in Pathobiology with areas of concentration in bacteriology, pathology, and virology. Standard admission requirements are maintained for these programs. There also is a study area offered in veterinary pathology, which is open only to Ph.D. students with the D.V.M. degree. In all of these areas, the accent is on basic sciences as related to diseases of animals.

**Requirements.** For the M.S. degree, generally 15 credits of course work and a thesis are required. No established sequence of courses is required for the Ph.D. degree. Since students possessing the D.V.M. degree usually have four more years of advanced education than the typical Ph.D. applicant, fewer courses may be required. In addition to graduate courses offered within the Department, the candidate is expected to take graduate courses in biochemistry, cell biology, genetics, statistics, and molecular biology in appropriate departments.

**Special Facilities.** The Department houses the Connecticut Veterinary Medical Diagnostic Laboratory which is equipped with a fully functioning mammalian and avian necropsy laboratory, histology laboratory and diagnostic microbiology, virology and serology laboratories. State of the art molecular biology facilities are present in the Department for research on infectious, immunologic, toxic and metabolic diseases. The Department also houses the Northeastern Research Center for Wildlife Diseases and the Microchemistry Laboratory. Collaborative opportunities exist with the USDA Plum Island Animal Disease Center and the School of Pharmacy Center for Biochemical Toxicology Program. The Department has excellent laboratory animal care facilities with surgical suite and a research farm.

### COURSES OF STUDY

**PVS 300. Research and Independent Study in Animal Diseases**

*1 - 6 credits, Independent Study. Instructor consent required.*

**PVS 306. Vaccines: Mechanisms of Immune Protection**

The focus is on several different approaches to inducing prophylactic immunity in the host. Both traditional and modern molecular approaches to vaccine design will be discussed. In addition, the mechanisms employed by pathogenic microbes to avoid hosts' immune responses will be examined in the context of vaccine design. The students will gain an appreciation for the transition from basic research to practical applications.

3 credits, Lecture. Instructor consent required. Also offered as ANSC 306.

**PVS 312. Veterinary Pathology Seminar**

A discussion of current problems in veterinary pathology with emphasis on histopathology and the related disciplines.

1 credit, Seminar. Instructor consent required.

**PVS 335. Clinical Chemistry**

Study of the application of chemical, molecular, and cellular concepts and techniques to the understanding and the evaluation of health and disease.

3 credits, Lecture.

**PVS 339. Avian Pathology**

A comprehensive study of systemic avian pathology, stressing the correlation of pathological changes with clinical and microbiological findings.

2 credits, Lecture. Instructor consent required.

**PVS 349. Immunobiology**

Principles of basic and clinical immunobiology; phylogeny and ontogeny of the immune response, characteristics of the immune response, cellular and humoral immunity; central and peripheral lymphoid tissues; mechanisms of immunologic injury and immunologic diseases; comparative and veterinary immunology; transplantation and tumor immunology.

3 credits, Lecture. Instructor consent required.

**PVS 350. Diagnostic Veterinary Microbiology**

Supervised instruction in the isolation and identification of pathogenic organisms from tissues and fluids of diseased animals and birds.

3 credits, Laboratory. Instructor consent required.

**PVS 354. Toxicological Pathology**

Principles of toxicological pathology are covered, with special attention to chemical carcinogenesis and systemic toxicological pathology. For the different systems, the particularities of structure and function of the system are reviewed, along with the particular mechanisms of toxicity to that system, the specific responses of that system to injury, and the methods to test for toxicity. The discussion of related scientific journal articles supplement the textbook information reviewed in lectures.

2 credits, Lecture. Instructor consent required.

**PVS 357. Evaluation of Diagnostic Test**

Sampling criteria and size determination, diagnostic test selection, diagnostic strategies, test result evaluation and interpretation.

2 credits, Lecture. Instructor consent required.

**PVS 358. Analytical Toxicology**

Qualitative and quantitative determination of xenobiotics. Isolation techniques; principles of chromatography and spectrometry; theory, instrumentation and analysis of data.

2 credits, Lecture. Instructor consent required.

**PVS 370. Pathobiology Seminar**

1 credit, Seminar. Instructor consent required.

**PVS 378. Molecular Approaches to Disease Diagnosis and Prevention**

Molecular aspects of disease, with emphasis on methodologies and strategies for diagnosis, analysis and prophylaxis.

2 credits, Lecture. Instructor consent required.

**PVS 379. Microbiology of Atypical Bacteria**

An in-depth presentation of current information on medically significant atypical bacteria, with emphasis on molecular aspects of pathogenesis.

2 credits, Lecture.

**PVS 384. Viral Pathogenesis**

Disease processes of the virus and host at the organic and molecular levels. Various aspects of selected viral infections will be covered, including contemporary topics of interest. Active student participation through presentations and discussion of literature.

2 credits, Lecture.

**†GRAD 395. Master's Thesis Research**

1 - 9 credits.

**†GRAD 396. Full-Time Master's Research**

3 credits.

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

3 credits.

**GRAD 398. Special Readings (Master's)**

Non-credit.

**GRAD 399. Thesis Preparation**

Non-credit.

**†GRAD 495. Doctoral Dissertation Research**

1 - 9 credits.

**†GRAD 496. Full-Time Doctoral Research**

3 credits.

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

3 credits.

**GRAD 498. Special Readings (Doctoral)**

Non-credit.

**GRAD 499. Dissertation Preparation**

Non-credit.

## PHARMACEUTICAL SCIENCE

*Interim Dean:* Professor Robert L. McCarthy

Course work and research programs leading to the M.S. and Ph.D. degree are offered through the Department of Pharmaceutical Sciences.

Course work and research programs leading to the M.S. degree are offered through the Department of Pharmacy Practice, however new students are **not** being admitted at this time.

Descriptions of the major research programs available in each of these departments as well as interdisciplinary areas and a list of faculty are shown below.

### PHARMACEUTICAL SCIENCE

*Department Head:* Professor John B. Morris

*Professors:* Gerald, Langner, Makriyannis, and Pikal

*Associate Professors:* Bahr, Bogner, Burgess, Gianutsos, Grant, Henkel, Hubbard, Kalonia, and Manautou

*Assistant Professors:* Aneskievich, Bouvier, and Pavlopoulos

*Research Professor:* Nightingale

*Adjunct Professors:* Amacher, Cohen, Levinsky,

Matheson, Stoll, and Stuart

*Adjunct Associate Professor:* Banijamali, Darrington, McNamara, Yang, and Zakrzewski

*Adjunct Assistant Professors:* Callegari, Gastonguay, and Yazdanian

Programs leading to the M.S. and Ph.D. degrees in Pharmaceutical Science are offered with areas of concentration in (1) Medicinal and Natural Products Chemistry, (2) Neurosciences, (3) Pharmaceuticals, and (4) Pharmacology and Toxicology. These programs make full use of courses offered by departments in such areas as organic, analytical, and physical chemistry; biochemistry; molecular and cell biology; neurobiology; biophysics; physiology; statistics; mathematics; microbiology; pathology; and materials science. A brief description and a statement of objectives for each of the areas of concentration are offered below.

**Medicinal and Natural Products Chemistry.** Medicinal chemists investigate the structural features responsible for the biological activity of drug molecules. To this end they design and synthesize new potentially active drugs. They also study the molecular mechanisms of drug action using biophysical methods and focusing on the stereoelectronic features of the drug and its interactions with its site of action. As a means of exploring the mechanism of drug action, they also study the target biopolymers through which drug activity is induced. Furthermore, they are interested in modifying drug structures to assist in targeting and to facilitate transport. Although their major concern is with chemistry, medicinal chemists must be also familiar with the pharmacological and biochemical systems on which the drug molecules act.



The M.S. (Plan A) and the Ph.D. are offered in the concentration of medicinal and natural products chemistry. A strong background in chemistry is essential for admission. Required course work varies with the background and interests of the student. This includes advanced courses in medicinal chemistry and pharmacognosy as well as courses from the following disciplines: organic, physical, and biophysical chemistry; spectroscopy; biophysics; biochemistry; molecular biology; pharmacology; microbiology.

**Neurosciences.** This is an interdisciplinary area of concentration. Neuroscience is concerned with the structural and functional characteristics of the nervous system and its relation to the adaptive physiology and behavior of the organism. Students in this program may approach the full range of neuroscience studies through courses and research at the cellular, systemic, and organismic levels. A particular strength of the area is the analysis of behavior, its development, and its neurological bases. This area of concentration is offered in the fields of study of biobehavioral science, pharmaceutical science, physiology, and psychology. Application is made to the preferred field of study, but the applicant must be acceptable to the Neurosciences Committee.

**Pharmaceutics.** Pharmaceutics deals with those factors bearing on the design of drug delivery systems that are safe and efficacious. The necessary concern with such factors as the stability of the drug molecule in a multitude of environments, the release of the drug from various dosage forms, surface and colloid chemistry, and the subsequent absorption, metabolism, and excretion of the drug requires a diversified educational and research experience. Faculty interests and graduate plans of study may emphasize kinetics, thermodynamics, transport phenomena, biopharmaceutics, pharmacokinetics, biopharmaceutics of proteins, and biotechnology. Moreover, each of these exposures entails an emphasis on quantitative appraisals which demand grounding in advanced mathematics. While individual dissertation problems usually are sharply focused, the overall thrust of the graduate program in pharmaceutics is the education of a generalist in drug delivery systems.

The M.S. (Plan A) and the Ph.D. are offered in the concentration of pharmaceutics. In particular, course work in advanced pharmaceutics, physical chemistry, and mathematics is required.

**Pharmacology and Toxicology.** Scholarly laboratory research and the educating of graduate students in all aspects of drug action are paramount activities of the pharmacology and toxicology faculty. Especially emphasized are therapeutic, immunological, and toxic reactions to drugs and chemicals and their physiological and biochemical mechanisms of action. Emphasis in the areas of biochemical toxicology and cardiovascular pharmacology, neuropharmacology and psychopharmacology as well as physiology and immunology, is available.

The M.S. (Plan A) and the Ph.D. are offered in the concentration of pharmacology and toxicology. For admission to the graduate program, a strong

background in biology as well as proficiency in chemistry, mathematics, and physics are essential. Course requirements for the Ph.D. degree are individualized, although advanced courses in pharmacology, physiology, and biochemistry are uniformly required.

**Special Facilities.** The Department has well-equipped laboratories in all research areas. Equipment available within the Department includes ultra-violet, F.T. infrared, dual wavelength, and fluorescence spectrophotometers, liquid scintillation spectrometers, analytical and preparative gas-liquid chromatographs, high-pressure liquid chromatographs, an F.T. nuclear magnetic resonance spectrometer, preparative and ultra centrifuge, low and high voltage electrophoresis apparatus, differential thermal analytical, and scanning calorimeter, thermal gravimetric and analytical equipment, and a fully-equipped radio-isotope synthetic laboratory. Computer terminals to the University main frame are available within the Department. X-ray equipment (powder and single crystal), electron spin resonance spectrometer, image analyzer, film balance, atomic absorptometer, gas chromatography-mass spectrometry unit, mass spectrometers, digital computers, and electron microscopes are available on campus. Two high-field NMR spectrometers for liquids and solids are available at the Institute of Materials Science. Animal quarters, cold rooms, and a greenhouse are also located in or adjacent to the School of Pharmacy.

## COURSES OF STUDY

### PHAR 301. Drug Design

A cooperative presentation of the fundamentals of medicinal chemistry.

*3 credits, Lecture. Instructor consent required.*

### †PHAR 303. Current Toxicology Literature

Designed to familiarize students with current toxicology literature and to educate students in critical peer review of this toxicology literature.

*1 credit, Lecture.*

### PHAR 305. Advanced Organic Medicinal Chemistry I

A detailed study of the structure-activity relationships of drugs, particularly those possessing central and autonomic nervous system actions.

*3 credits, Lecture. Instructor consent required.*

### PHAR 306. Advanced Organic Medicinal Chemistry II

A detailed study of the structure-activity relationships of drugs, particularly those possessing central and autonomic nervous system actions.

*3 credits, Lecture. Instructor consent required.*

### PHAR 307. Research Techniques

Principles and theory of methods for the extraction, separation, purification, and

identification of natural and synthetic organic compounds. Applications of isotopic methods to biosynthetic and chemical problems. Enzyme methodology. Instrumental analysis.

*3 credits, Lecture. Instructor consent required.*

### PHAR 308. Structure and Function of Biological Membranes

Overview of cell membrane structure and function based on a foundation of physical and biochemistry principles. Topics include lipid bilayers, vesicles and liposomes, cholesterol, membrane protein structure and function, transport, membrane fusion, receptors, drug/membrane interactions and membranes in cell regulation.

*3 credits, Lecture.*

### PHAR 311. Instrumental Analysis

An introduction to the theory and use of selected methods of instrumental analysis.

*1 - 3 credits, Lecture. Instructor consent required.*

### PHAR 315. Special Problems in Medicinal Chemistry

Individualized course for students desiring research experience in any of the areas of medicinal chemistry other than the area chosen by the student for thesis research.

*1 - 4 credits, Lecture. Instructor consent required.*

### PHAR 318. Special Topics in Medicinal Chemistry

Current developments in Medicinal Chemistry. A course for students needing exposure to topics not covered in other department offerings.

*1 - 6 credits, Lecture.*

### PHAR 325. Pharmaceutical Biotechnology

A survey of medicinal chemistry and pharmaceuticals of pharmaceutical products derived from modern methods of molecular biology. This course will consider products in use or in clinical trials to emphasize the conceptual basis, design, and synthesis of biotech products in the context of current practical applications.

*3 credits, Lecture. Instructor consent required.*

### PHAR 328. Special Topics in Pharmacognosy.

Includes topics not presently covered in courses which are pertinent to current departmental research.

*1 - 6 credits, Lecture. Instructor consent required.*

### PHAR 334. Advanced Biopharmaceutics.

Overview of physico-chemical, biopharmaceutic, and physiologic factors controlling the delivery of drug and their sites of action.

*3 credits, Lecture.*

### PHAR 335. Special Topics in Pharmaceutics

Includes topics not presently covered in courses which are pertinent to current departmental research and areas of recent development in the literature.

*1 - 6 credits, Lecture.*

**PHAR 338. Special Problems in Pharmaceutics**

Individualized course for students desiring research experience in any of the areas of pharmacy other than the area chosen by the student for thesis research.

*1 – 4 credits, Independent Study. Instructor consent required.*

**PHAR 339. Current Literature in Pharmaceutics**

Designed to familiarize students with current pharmaceutics literature and to educate students in critical peer review in the pharmaceutics literature.

*1 credit, Discussion.*

**PHAR 340. Pharmaceutical Freeze Drying**

The science and technology of freeze drying, including fundamentals of heat and mass transfer gas systems, process design considerations, and formulation strategies with emphasis on stabilization of therapeutic proteins.

*2 credits, Lecture. Instructor consent required.*

**PHAR 341. Advanced Kinetics and Mechanisms of Drug Degradation**

An advanced treatment of the physical organic chemistry critical to the characterization and understanding of stability in pharmaceutical products.

*2 credits, Lecture. Instructor consent required.*

*Prerequisite: PHAR 388.*

**PHAR 342. Freeze Drying of Pharmaceuticals**

The science and technology of freeze drying, including fundamentals of heat and mass transfer gas systems, process design considerations, and formulation strategies with emphasis on stabilization of therapeutic proteins.

*2 credits, Lecture. Instructor consent required.*

**PHAR 344. Solid-phase Peptide Synthesis**

Overview of the fundamental techniques and the latest advances in the field of solid-phase peptide synthesis. Topics include solid supports, protecting groups, coupling methods and reagents, strategies for conformational constraints, combinatorial chemistry, instrumentation, analytical techniques, and solid-phase organic synthesis.

*2 credits, Lecture.*

**PHAR 349. Introduction to Toxicology**

Basic principles and concepts of toxicology. Includes toxicokinetics, toxicodynamics, metabolism of xenobiotics, toxicology of major organ systems, introductions to carcinogenesis, mutagenesis and teratogenesis and case studies in environmental and occupational toxicology. Includes seminar sessions on current topics and issues in toxicology.

*3 credits, Lecture. Instructor consent required.*

**PHAR 352. Toxicology of the Respiratory System**

Anatomic and functional aspects of toxic injury to the respiratory tract with an emphasis on

biochemical and physiologic mechanisms of toxic pulmonary injury. Lectures and student presentations.

*2 credits, Lecture. Instructor consent required.*

*Prerequisite: PHAR 355.*

**PHAR 353. Genetic Toxicology**

An examination of chemicals which have DNA as a target for toxic interactions. Included are sections on DNA damage and its repair, mutagenesis measurement and mechanisms, indirect acting agents-promoters, comutagens, antimutagens, and interrelations among mutagenesis, cytotoxicity and carcinogenesis. Lectures and discussions of selected journal articles.

*2 credits, Lecture. Instructor consent required.*

**PHAR 354. Principles of Safety Evaluation**

Introduction to toxicologic risk assessment. Fundamentals of dose-response relationships and risk characterization, and their application in the establishment of permissible exposure limits for drugs and other chemicals in the environment or workplace.

*1 credit, Lecture.*

**PHAR 355. Advanced Toxicology**

A study of the harmful effects of toxic chemicals on biological systems. Emphasis is on mechanisms of toxicant action and on practical applications of modern techniques to assess toxicity and hazard.

*4 credits, Lecture.*

**PHAR 356. Special Problems in Pharmacology I**

The course is individualized for students desiring research experience in any of the areas of pharmacology.

*1 – 4 credits, Independent Study. Instructor consent required.*

**PHAR 357. Special Problems in Pharmacology II**

The course is individualized for students desiring research experience in any of the areas of pharmacology.

*1 – 4 credits, Independent Study. Instructor consent required.*

**PHAR 358. Analytical Toxicology**

Qualitative and quantitative determination of xenobiotics. Isolation techniques; principles of chromatography and spectrometry; theory, instrumentation and analysis of data.

*2 credits, Lecture. Instructor consent required.*

**PHAR 359. Immunotoxicology**

Demonstrates the detrimental effects on the immune system and/or inflammatory response, by a variety of physical and chemical xenobiotics. Emphasis is placed on the mechanisms of chemical and drug-induced immunosuppression, autoimmune response, and allergic response.

*2 credits, Lecture. Instructor consent required.*

**PHAR 365. Pharmacology of the Circulatory System**

A study of the cardiovascular system. Both physiological and pharmacological responses of the cardiovascular system are reviewed.

Emphasis is placed upon the biochemical and physiological changes associated with atherosclerosis.

*2 credits, Lecture. Instructor consent required.*

**PHAR 367. Synaptic Mechanisms in Pharmacology**

Regulation and function of CNS neurotransmitters and effects of drugs on synaptic mechanisms, especially drugs used in neurologic and behavioral disorders. Neurotoxicology.

*2 credits, Lecture. Instructor consent required.*

**PHAR 368. Electrolytic Homeostasis, Hormones, and Blood Pressure**

A study of the basic physiological and pharmacological mechanisms of renal function related to hormonal control of electrolyte homeostasis.

*2 credits, Lecture. Instructor consent required.*

**PHAR 371. Advanced Pharmacology I: Basic Principles**

Molecular mechanisms of drug action including occupation and rate theories. Characterization of receptors in-situ and *in-vitro*.

*3 credits, Lecture. Instructor consent required.*

**PHAR 372. Advanced Pharmacology II: Drug Disposition**

Drug absorption, distribution, excretion, metabolism, interaction, allergy, resistance, tolerance, idiosyncrasy and toxicity.

*2 credits, Lecture.*

**PHAR 375. Toxicology Scholars Colloquium**

Reviews, discussions and seminars focused on the research of scientists who have made significant contributions to the science of toxicology.

*1 credit, Lecture.*

**PHAR 376. Liver and Kidney Toxicology**

A study of the biochemical mechanisms responsible for chemically induced liver and kidney damage, including the uniqueness of these organs as targets of toxicant action. Emphasis is on recent mechanistic research. Includes lectures, discussions of recent literature, and student presentations and discussions.

*2 credits, Lecture. Instructor consent required.*

**†PHAR 377. Seminar in Medicinal Chemistry and Pharmacognosy**

Reports and discussions.

*1 credit, Seminar.*

**†PHAR 378. Seminar in Immunology**

Reports and discussions.

*1 credit, Seminar. Prerequisite: PHAR 393.*

**†PHAR 379. Seminar in Pharmacology and Toxicology**

Reports and discussions on journal and review articles and presentation of personal research results.

*1 credit, Seminar.*

**†PHAR 380. Seminar in Pharmaceutics**

Reports and discussions.

*1 credit, Seminar.*

**PHAR 382. Special Topics in Pharmacology**

Includes topics not presently covered in courses, which are pertinent to current departmental research and areas of recent development in the literature.

*1 - 6 credits, Lecture. Instructor consent required.*

**PHAR 383. Special Topics in Toxicology**

Basic principles of toxicology as emphasized by recent developments in the biochemical toxicology literature.

*1 - 6 credits, Lecture. Instructor consent required.*

**PHAR 384. Special Problems in Toxicology**

Individualized course for students desiring research experience in any of the areas of toxicology.

*1 - 4 credits, Independent Study. Instructor consent required.*

**PHAR 385. Complex Equilibria**

A study of the physico-chemical and mathematical treatment in pharmaceutical systems. Topics center on thermodynamics, activity coefficients, acids and bases, solubility, complexation solubilization and protein binding.

*3 credits, Lecture.*

**PHAR 386. Transport Processes**

Emphasis is on the application of the laws of diffusion to dissolution, membrane transport and release of drugs from dosage forms.

*3 credits, Lecture. Instructor consent required.*

**PHAR 387. Biopharmaceutics Techniques**

Laboratory techniques commonly used in biopharmaceutics and pharmacokinetic experiments in animals including routes of drug administration, common surgical techniques, and methods of collecting biological samples.

*1 credit, Laboratory. Instructor consent required.*

**PHAR 388. Kinetics and Mechanisms of Drug Degradation and Stability**

A study of the kinetics and mechanisms of drug degradation in the solid and liquid states and drug stabilization

*3 credits, Lecture. Instructor consent required.*

**PHAR 389. Pharmacokinetics**

A discussion of absorption, distribution, and clearance mechanisms, and their impact on concentration-time profiles and drug response.

*3 credits, Lecture. Instructor consent required.*

**PHAR 390. Colloid Chemistry and Interfacial Phenomena**

Interfacial phenomena, colloid chemistry.

*3 credits, Lecture. Instructor consent required.*

**PHAR 391. Product Development**

Liquid and solid dosage forms.

*3 credits, Lecture. Instructor consent required.*

**PHAR 392. Advanced Pharmacology III: Pharmacological Techniques**

Exercises in laboratories of faculty members demonstrating techniques in pharmacology, physiology and toxicology.

*1 - 6 credits, Laboratory.*

**†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

**†GRAD 396. Full-Time Master's Research**

*3 credits.*

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

**†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

■

## PHARMACY PRACTICE

*Department Head:* Clinical Professor Robert McCarthy

*Associate Professors:* Chapron, Facchinetti, and Speranza

Programs leading to the M.S. degree in Pharmaceutical Science are offered with areas of concentration in (1) Pharmacy Administration, and (2) Managed Care Pharmacy. **New students are not being admitted at this time.**

The primary objective of the study area in pharmacy practice is to develop scholars competent to investigate problems of a social and economic nature as they relate to health and pharmacy care. A secondary objective is to develop individuals who can serve as effective managers of pharmacy care

systems. The scientific method serves as the common intellectual framework for all students. Pharmacy administration, health care management, statistics, and social science research methodologies provide the core knowledge base for all students, and emphasis in the administrative or behavioral sciences is offered. Since pharmacy is but one of many systems involved in the delivery of health care, interdisciplinary research and educational experiences are strongly emphasized. The place of pharmacy in the health care process, however, is the focus of the total endeavor.

## COURSES OF STUDY

**PHAR 327. Advanced Hospital Pharmacy Administration**

A study of the development, administration and operation of hospital pharmacies. Case studies are used to illustrate problem-solving techniques in hospital pharmacy practice. Current trends, procedures and policies will be presented by appropriate personnel from cooperating institutions.

*3 credits, Lecture.*

**PHAR 346. Introduction to Managed Care Pharmacy**

A study of managed care pharmacy within the United States health care system, with emphasis on managed care organization and control, pharmacy benefits design and management, outcomes measurement, pharmacoeconomics, health care provider and client education, benefits plan financing and marketing, and legal issues of managed care pharmacy.

*3 credits, Lecture. Instructor consent required.*

**PHAR 347. Special Topics in Pharmacy Administration**

Current developments in Pharmacy Administration. A course for students needing exposure to topics not covered in other Department of Pharmacy Practice offerings.

*1 - 6 credits, Lecture. Instructor consent required.*

**PHAR 348. Health Care Administration**

An in-depth study of the health care system in this country. Emphasis is placed on current methods, problems and trends in health care delivery. Analytical approaches necessary for assessing and improving the system are stressed through case studies.

*2 credits, Lecture.*

**PHAR 362. Special Problems in Pharmacy Practice**

Individualized course for students desiring research experience in pharmacy administration or hospital pharmacy administration.

*1 - 4 credits, Independent Study.*



## PHILOSOPHY

### PHAR 364. Advanced Pharmacy Administration

A study of modern management techniques applicable in terminal drug distribution. Special emphasis is placed upon quantitative methods and the utilization of electronic data processing. *3 credits, Lecture. Instructor consent required.*

### †PHAR 381. Seminar in Pharmacy Administration

Reports and discussions. *1 credit, Seminar. Instructor consent required.*

### †GRAD 395. Master's Thesis Research

*1 - 9 credits.*

### †GRAD 396. Full-Time Master's Research

*3 credits.*

### †GRAD 397. Full-Time Directed Studies (Master's Level)

*3 credits.*

### GRAD 398. Special Readings (Master's)

*Non-credit.*

### GRAD 399. Thesis Preparation

*Non-credit.*

*Department Head:* Professor Crawford L. Elder  
*Professors:* Anderson, Baxter, Clark, Gilbert, Krimerman, Kupperman, Meyers, Millikan, and Wheeler  
*Associate Professors:* Hiskes, Lehmann, and Troyer  
*Assistant Professors:* Beall, Bloomfield, and Bontly

The Department of Philosophy offers study leading to the degree of Master of Arts and Doctor of Philosophy. Courses of study typically focus on philosophy of psychology and mind or on philosophy of social phenomena and ethics, but also can be built around philosophy of language, metaphysics, or history of philosophy. The instruction is broad enough to make students versatile undergraduate instructors, and concentrated enough to enable students to do significant research.

Students are able to work closely with the faculty at every stage of progress from the initial construction of a plan of study to the completion of a dissertation. In this way, the work can be guided toward that aspect of philosophy that is of most interest to the student and also provide the student with a sound background in the field. First year students must satisfy a formal logic requirement, normally by taking Philosophy 307. First year students also should take Philosophy 301 (unless they have a strong background in contemporary analytic philosophy) and Philosophy 302 (unless they have a strong background in moral theory and meta-ethics).

**Admission.** After reviewing the basic requirements for admission to the Graduate School, applicants should present to the Philosophy Department their scores for the General Test of the Graduate Record Examinations, three letters of recommendation from individuals familiar with their academic work, and a philosophical writing sample.

**The M.A. Program.** The student's program should insure competence in the history of philosophy and in current trends in the field. The Department generally offers only Plan B (non-thesis) for the M.A.

**The Ph.D. Program.** The Ph.D. degree requires a minimum of eight graduate seminars beyond the M.A. level. Students who enroll in the Ph.D. program with an M.A. from another institution are reviewed after one year. A student may meet the Ph.D. language requirement by passing examinations in two foreign languages, usually French and German, or by passing an examination in one of these languages and completing either a six-credit Related Area, or, alternatively, six credits of advanced logic beyond the level of Philosophy 307.

The General Examination normally is taken within one year of the completion of course work. The General Examination is in three parts: 1) Metaphysics and Epistemology (three hours), 2) Social and Political Philosophy and Ethics (three hours), and 3) History of Philosophy (three hours).

The Department provides the student with a reading list which indicates the scope of the separate examinations.

**Special Facilities.** The holdings of the Homer Babbidge Library are adequate for the pursuit of scholarly research in most fields of philosophy. The Library subscribes to all major philosophic journals and has a complete collection of past issues of most journals. The Department conducts informal weekly seminars at which members discuss current research with their colleagues. It runs a program of colloquia featuring distinguished philosophers from around the country, and presents the yearly Ruth Evelyn Parcells Lecture in ethics.

## COURSES OF STUDY

### PHIL 300. Independent Study for Graduate Students

*1 - 6 credits, Independent Study. Open to graduate students in Philosophy, others with permission.*

### PHIL 301. Seminar in Contemporary Philosophy

An introduction to contemporary philosophers such as Russell, Carnap, Ayer, Quine, Putnam, and Kripke.

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

### PHIL 305. Seminar in Aesthetics

A consideration of some of the basic problems in aesthetics.

*3 credits, Lecture. Open to graduate students in Philosophy, others with permission.*

### PHIL 307. Logic

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

### PHIL 311. Properties of Formal Systems

The development of formal deductive systems. The completeness and consistency of logical systems adequate for the expression of parts of mathematics. A consideration of aspects of the foundations of logic and mathematics.

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

### PHIL 312. Seminar in the Philosophy of Science

A discussion of selected current, methodological issues in the philosophy of science. Topics may include scientific realism versus nonrealism; theories of scientific explanation; the nature of scientific revolutions; theories of the lawfulness of nature; and feminist theories of science.

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

### PHIL 313. Seminar in the Philosophy of Physics

Examination of philosophical issues associated with physical concepts of space, time, and matter. Topics may include relational versus absolute theories of space and time, and philosophical implications of quantum mechanics.

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 315. Seminar in Moral Philosophy**

A discussion and analysis of significant problems in ethical theory.

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 316. Seminar in the Philosophy of Social Science**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 317. Seminar in the Philosophy of Psychology**

Philosophical examination of contemporary issues in the philosophy of psychology. Topics may include a philosophical analysis of the nature of behavior, consciousness, perception, cognition, and emotion; the nature of psychological explanation; comparison of the science of human psychology with ethology and other biological sciences, the physical sciences, and computer science.

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 318. Seminar on Plato**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 319. Seminar on Aristotle**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 320. Seminar in the History of Philosophy**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 321. Seminar on the British Empiricists**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 326. Seminar on Rationalist Philosophers of the Seventeenth and Eighteenth Centuries**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 327. Seminar on Kant**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 329. Seminar on Existentialism and Phenomenology**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 330. Seminar on Theory of Knowledge**

Problems in the foundations and nature of knowledge. A critical study of recent treatments of the problem of mind. Issues such as the mind-body problem, our knowledge of the existence of other minds, the existence of private languages, will be dealt with in detail.

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 331. Seminar in Philosophy of Mind**

A critical study of recent treatments of the problem of mind. Issues such as the mind-body problem, our knowledge of the existence of other minds, the existence of private languages, will be dealt with in detail.

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 333. Seminar on Nietzsche**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 340. Seminar on Metaphysics**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 342. Seminar in Philosophy of Language**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 345. Seminar on Wittgenstein**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 350. Seminar in Recent Social and Political Philosophy**

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 352. Seminar in Feminist Theory**

The focus of inquiry might be the history of feminist theory, a school of contemporary feminist theory, an issue or a selection of issues in feminist theory, or feminist approaches to major texts or themes in the history of philosophy.

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 360. Seminar in Recent Continental Analytic Philosophy**

Critical reading of selected texts of recent European philosophers such as Derrida, Irigaray, Kristeva, Heidegger, and Foucault; along with related work of analytic philosophers such as Davidson, Quine, Rorty, and Kripke.

*3 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

**PHIL 397. Seminar**

*1 - 6 credits, Seminar. Open to graduate students in Philosophy, others with permission.*

†GRAD 395. Master's Thesis Research  
*1 - 9 credits.*

†GRAD 396. Full-Time Master's Research  
*3 credits.*

†GRAD 397. Full-Time Directed Studies (Master's Level)  
*3 credits.*

GRAD 398. Special Readings (Master's)  
*Non-credit.*

GRAD 399. Thesis Preparation  
*Non-credit.*

†GRAD 495. Doctoral Dissertation Research  
*1 - 9 credits.*

†GRAD 496. Full-Time Doctoral Research  
*3 credits.*

†GRAD 497. Full-Time Directed Studies (Doctoral Level)  
*3 credits.*

GRAD 498. Special Readings (Doctoral)  
*Non-credit.*

GRAD 499. Dissertation Preparation  
*Non-credit.*

## PHYSICAL THERAPY

*Dean:* Professor Joseph W. Smey

*Department Head:* Professor Scott M. Hasson

*Professor:* Bohannon

*Associate Professors:* Cosmas, Roberts, Tiberio, and Zito

*Assistant Professor:* Kinsella-Shaw

*Clinical Associate Professor:* Leavitt

The Department of Physical Therapy offers an Integrated Bachelor's/Master's program leading to the M.S. degree. Students are required to complete a highly structured program of study over a total of 6 semesters and 3 summer sessions which includes: basic and clinically applied sciences; clinical medicine; allied health; research; rehabilitation; and clinical practicums. Students are educated to work in and with a wide variety of patients and clinical settings. There is no emphasis on one area of physical therapy practice. Areas covered include: acute care; sub-acute; nursing home; home health care; orthopaedics; and neurological rehabilitation. The program is designed to prepare entry-level practicing physical therapists. Emphasis is placed on developing the skills and abilities necessary to function in the complex always changing health care arena. These skills and abilities include, but are not limited to: a commitment to learning; interpersonal and communication skills; time, resources and stress management; professionalism; and independent problem solving and critical analysis.

Students complete Plan B (research project-professional paper), or with the approval of the Department Head Plan A (thesis). In Plan A or in Plan B the student utilizes problem solving methodology and the scientific method of inquiry in the completion of the research endeavor. The thesis is structured in the classical manner of five chapters, while the professional paper is written in journal format.

**Admission.** In addition to the standard requirements of the Graduate School, applicants must have successfully completed the baccalaureate portion of the Integrated Bachelor's/Masters Program.

### COURSES OF STUDY

#### PT 307. Integrative Seminar I

One of a series of seminars which integrate application, assessment and intervention knowledge and experience across multiple courses. Focus is on the acute, sub-acute and long-term nursing home patient population. Students develop competency in critical thinking, problem-solving, clinical decision making and best practice recommendations for the acute, sub-acute and long-term nursing home patient population groups. Students demonstrate critical reading skills of the professional literature that reflects an understanding of the problems and functional limitations of the acute, sub-acute and

long-term nursing home.

*3 credits, Seminar. Prerequisite: PT 212. Open only to students in the Program in Physical Therapy.*

#### PT 308. Integrative Seminar II

One of a series of seminars which integrate application, assessment and intervention knowledge and experience across multiple courses; and develops the research project—professional paper. Focus is on the acute, sub-acute and long-term nursing home and musculoskeletal patient population. Students identify and discuss professional issues generated by observations made in the acute, sub-acute and long-term nursing home practicum setting. Students develop competency in critical thinking, problem solving, clinical decision making and best practice recommendations for the musculoskeletal patient. Students demonstrate critical reading skills of the professional literature that reflects an understanding of the problems and functional limitations of the musculoskeletal patient population. Students submit a research project proposal that includes a comprehensive literature review, research hypotheses and methods.

*3 credits, Seminar. Prerequisite: PT 307. Physical Therapy majors only.*

#### PT 308W. Integrative Seminar II

One of a series of seminars which integrate application, assessment and intervention knowledge and experience across multiple courses; and develops the research project—professional paper. Focus is on the acute, sub-acute and long-term nursing home and musculoskeletal patient population. Students identify and discuss professional issues generated by observations made in the acute, sub-acute and long-term nursing home practicum setting. Students develop competency in critical thinking, problem solving, clinical decision making and best practice recommendations for the musculoskeletal patient. Students demonstrate critical reading skills of the professional literature that reflects an understanding of the problems and functional limitations of the musculoskeletal patient population. Students submit a research project proposal that includes a comprehensive literature review, research hypotheses and methods. Includes a writing component.

*3 credits, Seminar. Prerequisite: PT 307. Physical Therapy majors only.*

#### PT 309. Integrative Seminar III

One a series of seminars which integrate application, assessment and intervention knowledge and experience across multiple courses; and develops the research project—professional paper. Focus is on the musculoskeletal and neuromuscular patient population. Students identify and discuss professional issues generated by observations made in the musculoskeletal practicum setting. Students develop competency in critical thinking, problem

solving, clinical decision making and best practice recommendations for the neuromuscular patient. Students demonstrate critical skills of the professional literature that reflects an understanding of the problems and functional limitations of the neuromuscular patient population. Students collect data and prepare preliminary results of their findings.

*3 credits, Seminar. Prerequisites: PT 308 and PT318.*

#### PT 310. Integrative Seminar IV

One of a series of seminars which integrate application, assessment and intervention knowledge and experience across multiple courses. Focus is on the neuromuscular patient population. Students identify and discuss professional issues generated by observations made in the neuromuscular practicum setting. Students meet identified standards on competency in critical thinking, problem solving, clinical decision making and best practice recommendations for all patient populations in this culminating course.

*3 credits, Seminar. Prerequisite: PT 309 and PT 320.*

#### PT 311. Integrative Seminar V

One of a series of seminars which develops the research project-professional paper. Focus is to complete and present the research project-professional paper in this culminating course.

*3 credits, Seminar. Prerequisite: PT 309.*

#### PT 314. Principles of Rehabilitation

Explores the role of physical therapists in the rehabilitation of patients with complex problems and multi-system dysfunction. Students develop competency in assessment, treatment planning and implementation, and evaluation of treatment outcomes in the areas of functional mobility and accessibility, patient education and prevention of complications.

*3 credits, Practicum. Prerequisite: PT 212.*

#### †PT 316. Acute Care Practicum

In a supervised acute care setting, sub-acute care setting or long-term nursing home, students apply a variety of patient care procedures and techniques leading to the development of entry level competency. Clinical teaching facilities are located throughout the United States.

*7 credits, Practicum. Prerequisite: PT 212.*

#### PT 318. Principles of Musculoskeletal Rehabilitation

Focus is on the physical therapy care of patients with existing or potential musculoskeletal dysfunction. The student learns to establish physical therapy diagnoses, identify realistic goals, plan and implement programs for patients with musculoskeletal problems, giving full consideration to their physical, social and psychological well being.

*6 credits, Lecture. Prerequisite: PT 308.*



**PT 320. Principles of Neuromuscular Rehabilitation**

Through comprehensive problem solving, students analyze patient situations where neuromotor dysfunction is a complicating factor. Students develop neurophysiological sound evaluation and treatment skills integrating physical and psychological patient considerations.

6 credits, Practicum. Prerequisites: PT 308 and PT 318.

**†PT 322. Musculoskeletal Practicum**

In an outpatient orthopedic setting, students apply a variety of patient care activities leading to the development of entry level competency. Clinical teaching facilities are located throughout the United States.

7 credits, Practicum. Prerequisite: PT 318.

**†PT 324. Neuromuscular Practicum**

In a neuromuscular rehabilitation setting, students apply a variety of patient care procedures and techniques leading to the development of entry level competency. Clinical teaching facilities are located throughout the United States.

10 credits, Practicum. Prerequisite: PT 320.

**PT 330. Lifespan Growth and Development**

Provides an overview of motor development, individual development and family development from a lifespan perspective as they relate to the practice of physical therapy. The impact of disease and disability on the individual and the family is explored with a focus on recognizing dysfunction and facilitating effective coping and adaptation.

3 credits, Lecture. Prerequisite: PT 308.

**PT 343. Physical Therapy Issues Seminar**

Through discussion of current issues and problems in the professional field of physical therapy, students explore the possible solutions to those problems from their own perspective as aspiring professionals, the professional organization's perspective and from the perspective of the consumer of their services.

3 credits, Lecture. Prerequisite: PT 308.

**†GRAD 395. Master's Thesis Research**

1 - 9 credits.

**†GRAD 396. Full-Time Master's Research**

3 credits.

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

3 credits.

**GRAD 398. Special Readings (Master's)**

Non-credit.

**GRAD 399. Thesis Preparation**

Non-credit.

## PHYSICS

*Department Head:* Professor William C. Stwalley  
*Professors:* Best, Budnick, Dunne, Dutta, Eyler, Gai, Gould, Haller, Hamilton, Hines, Islam, Javanainen, Kappers, Kessel, Madacsi, Mallett, Mannheim, Pease, Peterson, Pollack, Rawitscher, Smith, and Swanson

*Research Professors:* Roychoudhuri and Schweitzer  
*Associate Professors:* Fernando, Gibson, Jones, Ramsey-Musolf, and Sinkovic

*Assistant Professors:* Côté, Dobrynin, Joo, Utz, Yelin, and Wells

The Master of Science and Doctor of Philosophy degrees are offered.

**Admission.** For admission to either the M.S. or Ph.D. program, completion of a bachelor's degree normally is required. It is expected that the applicant will have majored in physics or in a related subject.

**The Master of Science Degree.** Each student in the Master's program follows an individual plan of study arranged jointly by the student and an advisory committee, based on the student's career goals as well as prior preparation. Candidates for the Plan B Master's degree are required to complete 24 credits of courses. Under Plan A, a thesis is required, as well as completion of 9 credits of Thesis Research courses as stipulated in the Standards and Degree Requirements section of this catalog.

**The Ph.D. Degree.** Each doctoral student's course of study is supervised by an advisory committee, headed by the student's major advisor. The committee and the student jointly plan a curriculum that is designed to provide the general knowledge of physics appropriate for the Ph.D. and also the specialized expertise necessary to conduct dissertation research. This research is conducted under the supervision of the major advisor and culminates in an original scientific contribution.

There are numerous research projects in the Department of Physics which provide graduate students with opportunities for conducting the scientific investigations necessary for the Ph.D. degree. These include atomic, molecular and optical physics (experimental and theoretical), condensed matter physics (experimental and theoretical), nuclear physics (experimental and theoretical), particle and field theory (including relativity and cosmology) and quantum optics (experimental and theoretical). Active research groups are engaged in each of these areas. Their work is described on-line at <<http://www.phys.uconn.edu>>. A brochure that describes the Department's graduate program is on-line; copies may also be obtained by writing to the Department of Physics (by mail to Attn: Lorraine Smurra, Department of Physics, Unit 3046, 2152 Hillside Road, University of Connecticut, Storrs, Connecticut 06269-3046 or to e-mail address <[physadm@uconnvm.uconn.edu](mailto:physadm@uconnvm.uconn.edu)>).

**Special Requirements for the Ph.D.** The requirements for the Ph.D. include all the general requirements listed in the Standards and Degree Requirements section of this catalog. In addition, satisfactory completion of Physics 321

(Electrodynamics II) and Physics 343 (Quantum Mechanics III) is required for the Ph.D. degree.

The General Examination in physics consists of written and oral sections. A set of written examinations must be completed satisfactorily to qualify for admission to the oral part of the General Examination.

### COURSES OF STUDY

**†PHYS 300. Independent Study**

A special reading course for graduate students. 1 - 6 credits, Independent Study. Instructor consent required.

**PHYS 304. Research in Physics**

Experimental and theoretical research in selected topics in physics.

1 - 6 credits, Laboratory. Instructor consent required.

**PHYS 305. Computerized Modeling in Science**

Development and computer-assisted analysis of mathematical models in chemistry, physics, and engineering. Typical topics include chemical equilibrium, reaction rates, particle scattering, vibrating systems, least square analysis and quantum chemistry.

4 credits, Lecture. Instructor consent required.

**PHYS 306. Electrodynamics I**

Differential formulations of electrostatics and magnetostatics, electromagnetic induction. Maxwell equations, electromagnetic waves, application to wave guides, cavities, and dispersive media. Foundations of special relativity.

3 credits, Lecture. Prerequisite: PHYS 312.

**PHYS 308. Introduction to Statistical Mechanics and the Kinetic Theory of Gases**

Equations of state, molecular collisions and mean free paths, H theorem, Maxwell-Boltzmann distribution, the Boltzmann equation.

3 credits, Lecture. Prerequisite: PHYS 318.

**†PHYS 310. Physics Seminar**

The treatment of special topics, primarily by individual readings and reports.

1 credit, Seminar. Instructor consent required.

**PHYS 311. Methods of Theoretical Physics I**

General orthogonal coordinate systems, special functions and differential equations of Physics, Sturm-Liouville Theory, general eigenvalue equations.

3 credits, Lecture.

**PHYS 312. Methods of Theoretical Physics II**

Abstract vector spaces, Hilbert space, group theory. Theory of Green's function and integral equations. Complex function theory.

3 credits, Lecture. Prerequisite: PHYS 311.

**PHYS 314. Methods of Experimental Physics**

Experimental methods used in modern research

are applied to experiments from various fields of physics, including: low temperature conductivity of metals, x-ray diffraction, acoustic attenuation, optical constants of metals, color centers in alkali halides, nuclear beta decay, Zeeman effects and others.

*1 – 6 credits, Laboratory.*

**PHYS 315. Elementary Treatment of Recent Advances in Physics**

Development of concepts and theories of physics from an elementary point of view. Review of experiments leading to present views of the atomic nature of matter and energy. This course is recommended for present and prospective teachers of physics.

*3 credits, Lecture. Instructor consent required.*

**PHYS 316. Modern Physics for Teachers**

New teaching materials and techniques as developed by the Physical Science Study Committee for secondary school teachers of physics.

*3 credits, Lecture. Prerequisite: PHYS 317, which must be taken concurrently.*

**PHYS 317. Modern Physics Experiments for Teachers**

Laboratory exercises, demonstrations, and experimental homework prepared by the Physical Science Study Committee.

*3 credits, Laboratory. Prerequisite: PHYS 316, which must be taken concurrently.*

**PHYS 318. Theoretical Mechanics I**

Classical mechanics: Lagrange equations, central force motion, rigid body motions, small oscillations, Hamilton equations, canonical transformation.

*3 credits, Lecture.*

**PHYS 319. Theoretical Mechanics II**

Dynamics of continuous media, hydromechanics, elasticity, wave motion, wave interactions and scattering, non-linear processes.

*3 credits, Lecture. Prerequisite: PHYS 318.*

**PHYS 321. Electrodynamics II**

Maxwell's equations with time dependent sources; radiation from relativistic charged particles; dynamical laws for charged particles; diffraction of electromagnetic waves.

*3 credits, Lecture. Prerequisite: PHYS 306 and PHYS 318.*

**PHYS 322. Quantum Mechanics I**

Mathematical formulation and interpretation of quantum mechanics. Illustrative examples. Hydrogen atom. Dirac ket and bra vectors, matrix methods. Scattering theory.

*3 credits, Lecture. Prerequisites: PHYS 312 and PHYS 318.*

**PHYS 323. Quantum Mechanics II**

Symmetry and angular momentum. Approximation methods for stationary and time-dependent

problems, with applications. Relativistic theory of the electron.

*3 credits, Lecture. Prerequisite: PHYS 322.*

**PHYS 324. Statistical Mechanics**

Ensembles, distribution function, partition functions. Bose-Einstein and Fermi Dirac distributions, fluctuations, applications to properties of solids, liquids and gases.

*3 credits, Lecture. Prerequisite: PHYS 308 and PHYS 322.*

**PHYS 325. Advanced Topics in Physics I**

Selected topics in theoretical and experimental physics.

*1 – 6 credits, Lecture. Instructor consent required.*

**PHYS 326. Advanced Topics in Physics II**

Selected topics in theoretical and experimental physics.

*1 – 3 credits, Lecture. Instructor consent required. Prerequisite: PHYS 325.*

**PHYS 327. Modern Physics**

Experimental and theoretical milestones in the development of contemporary physics. Atomic, molecular, and optical physics including quantum optics; condensed matter physics; nuclear and particle physics; and cosmology and astrophysics.

*3 credits, Lecture. Prerequisite: PHYS 322.*

**PHYS 328. Solid State Physics I**

Crystal structure; lattice vibrations; electronic band structure of solids; transport theory; basic properties of metals, semi-conductors and insulators; magnetism; super-conductivity.

*3 credits, Lecture. Prerequisite: PHYS 323.*

**PHYS 329. Solid State Physics II**

Crystal structure; lattice vibrations; electronic band structure of solids; transport theory; basic properties of metals, semi-conductors and insulators; magnetism; super-conductivity.

*3 credits, Lecture. Prerequisite: PHYS 328.*

**PHYS 331. X-Ray Physics I**

Symmetry of crystals. Production and properties of x-rays. Application of x-rays in the study of crystalline and amorphous solids by diffraction and spectroscopic techniques, including synchrotron radiation for studying atomic and electronic structures in materials.

*3 credits, Lecture.*

**PHYS 332. X-Ray Physics II**

Symmetry of crystals. Production and properties of x-rays. Application of x-rays in the study of crystalline and amorphous solids by diffraction and spectroscopic techniques, including synchrotron radiation for studying atomic and electronic structures in materials.

*3 credits, Lecture. Prerequisite: PHYS 331.*

**PHYS 335. Microwave Physics I**

The principles of microwave and radio frequency

techniques applied to investigation of the properties of matter.

*3 credits, Lecture. Prerequisite: PHYS 306.*

**PHYS 336. Microwave Physics II**

Current investigations of the properties of matter by microwave and radio frequency methods, with special emphasis on paramagnetic defects in solids.

*3 credits, Lecture. Prerequisite: PHYS 323, which may be taken concurrently, and PHYS 335.*

**PHYS 337. Atomic Physics**

Coupling of angular momenta. Hartree-Fock theory of many electron atoms, fine structure and hyperfine structure. Introduction to group theory.

*3 credits, Lecture. Prerequisite: PHYS 323.*

**PHYS 338. Molecular Physics**

Heitler-London and molecular orbital theories for diatomic molecules, semi-empirical methods of poly-atomic molecules.

*3 credits, Lecture. Prerequisite: PHYS 337.*

**PHYS 339. Advanced Solid State Physics**

The many-body problem in solid state physics. The electron gas, normal metals, electron-phonon interactions, superconductivity, ferro- and antiferro-magnetism and spin waves, polaron theory.

*3 credits, Lecture. Prerequisite: PHYS 329 or PHYS 345.*

**PHYS 340. Nuclear Physics I**

A quantum mechanical treatment of nuclear forces and nuclear structure, including the shell and collective models, and of reaction and radiation phenomena. The second semester is reserved for a discussion of selected topics on an advanced level.

*3 credits, Lecture. Prerequisite: PHYS 323.*

**PHYS 341. Nuclear Physics II**

A quantum mechanical treatment of nuclear forces and nuclear structure, including the shell and collective models, and of reaction and radiation phenomena. The second semester is reserved for a discussion of selected topics on an advanced level.

*3 credits, Lecture. Prerequisite: PHYS 340.*

**PHYS 342. Relativity**

Special relativity, tensor analysis, foundations of general relativity, Petrov classification of curved spacetimes, Schwarzschild and Kerr solutions, experimental tests and recent developments.

*3 credits, Lecture.*

**PHYS 343. Quantum Mechanics III**

Occupation number representation, electron gas, Hartree-Fock approximation, correlation energy, superconductivity, perturbation theory, Green's functions, Feynman diagrams.

*3 credits, Lecture. Prerequisite: PHYS 323.*

**PHYS 344. Quantum Theory of Fields I**

Local gauge invariance, Lagrangian formulation, Noether currents, spontaneous breakdown of symmetry, Higgs mechanism and superconductivity, canonical quantization, Feynman diagrams, Green's functions.

3 credits, Lecture. Prerequisite: PHYS 343.

**PHYS 345. Quantum Theory of Fields II**

Topics chosen from the following: Path integral formalism, generating functionals, renormalization, abelian and non-abelian gauge theories (QED and QCD), electroweak theory, solitons, instantons.

3 credits, Lecture. Prerequisite: PHYS 344.

**PHYS 346. Scattering Theory I**

Symmetries and conservation theorems. Formal scattering theory. Born expansion and Fredholm theory. Two-body problems with central forces. Scattering by non-central forces. Lifetimes and decays of virtual states. Dispersion relations. Scattering by bound particles and rearrangement collisions. Inverse problems. Applications to atomic, nuclear, and elementary particle physics. Variational bounds on scattering parameters. Multiple scattering and diffraction. Optical potential formulation of reaction theory.

3 credits, Lecture. Prerequisite: PHYS 323.

**PHYS 347. Scattering Theory II**

Symmetries and conservation theorems. Formal scattering theory. Born expansion and Fredholm theory. Two-body problems with central forces. Scattering by non-central forces. Lifetimes and decays of virtual states. Dispersion relations. Scattering by bound particles and rearrangement collisions. Inverse problems. Applications to atomic, nuclear, and elementary particle physics. Variational bounds on scattering parameters. Multiple scattering and diffraction. Optical potential formulation of reaction theory.

3 credits, Lecture. Prerequisite: PHYS 346.

**PHYS 352. Non-Equilibrium Properties of Solids**

Electrical and thermal conduction, thermoelectricity. Electrons and phonons. Perturbation techniques to estimate interaction rates; electron-phonon, phonon-phonon and imperfection scattering processes. Ultrasonic generation and attenuation, spin-lattice interactions.

3 credits, Lecture. Prerequisite: PHYS 328.

**PHYS 355. Nuclei and Particles**

Properties of nuclei and particles, conserved quantities, isospin, quark model, Fermi gas model, electroweak interaction, high energy scattering.

3 credits, Lecture.

**PHYS 357. Nuclear Magnetic Resonance I**

Basic theory and experimental methods of NMR with emphasis on resonance and relaxation in metals. Brief discussion of interpretation of NMR in non-metallic solids, liquids, and gases.

3 credits, Lecture. Prerequisite: PHYS 322.

**PHYS 358. Nuclear Magnetic Resonance II**

Basic theory and experimental methods of NMR with emphasis on resonance and relaxation in metals. Brief discussion of interpretation of NMR in non-metallic solids, liquids, and gases.

3 credits, Lecture. Prerequisite: PHYS 357.

**PHYS 361. Low Temperature Physics I**

Lectures and seminars on selected topics in low temperature physics; superfluidity and superconductivity, solid state, nuclear alignment and polarization, transport properties in solids.

3 credits, Lecture. Instructor consent required.

**PHYS 362. Low Temperature Physics II**

Lectures and seminars on selected topics in low temperature physics; superfluidity and superconductivity, solid state, nuclear alignment and polarization, transport properties in solids.

3 credits, Lecture. Instructor consent required.

Prerequisite: PHYS 361.

**PHYS 363. The Electrical Properties of Polymers**

Experimental and theoretical aspects of electrical phenomena in polymers: DC and AC conductivity, dielectric constant, electrical breakdown, photoconductivity, etc. Extended and localized electron wavefunctions; band and hopping conduction.

3 credits, Lecture.

**PHYS 365. Quantum Optics**

Semiclassical theory of light-matter interactions. Quantum states of light. Generation, detection and interactions of nonclassical radiation.

3 credits, Lecture. Prerequisite: PHYS 322.

**PHYS 367. Semiconductor Physics**

Semiconductors and semiconductor devices. Band structure, phonon scattering, velocity-field relations, effects of doping and magnetic fields, optical and transport properties.

3 credits, Lecture. Prerequisites: PHYS 377 and

PHYS 323, which may be taken concurrently.

**PHYS 368. Semiconductor Optical Devices**

Semiconductor based optical devices such as lasers, amplifiers, modulators, and photodetectors, and their application to optical fiber transmission systems.

3 credits, Lecture. Prerequisite: PHYS377.

**PHYS 370. Principles of Lasers**

The physics of lasers, including optical pumping and stimulated emission, laser rate equations, optical resonators, non-linear optics, the Kerr effect and Faraday rotation. Applications to gas, crystal, glass, liquid, dye, semiconductor, chemical and ultraviolet lasers, Q-switching, mode-locking, and parametric devices.

3 credits, Lecture.

**PHYS 371.\* Physical Optics I**

Maxwell's equation, solutions of the wave equation, reflection and refraction, intensity, interference, Kirchhoff's diffraction theory.

3 credits, Lecture. Prerequisite: PHYS 311.

**PHYS 372.\* Physical Optics II**

Fraunhofer and Fresnel diffraction, diffraction theory of aberrations. Fourier optics and coherence theory. Consent of instructor required of non-degree graduate students.

3 credits, Lecture. Prerequisite: PHYS 371.

**PHYS 373.\* Geometrical Optics I**

Wave surfaces and rays, reflection and refraction, dispersion, ray tracing, paraxial optics, simple instruments.

3 credits, Lecture.

**PHYS 374.\* Geometrical Optics II**

First and third order aberrations, aberration control, optical system design.

3 credits, Lecture. Prerequisite: PHYS 373.

**PHYS 376. Interaction of Light with Matter**

Introduction to classical and quantum theories of the interaction of electromagnetic radiation with matter. Applications to remote sensing, photochemistry, laser fusion, solar energy conversion and photosynthesis.

3 credits, Lecture.

**PHYS 377. Fundamentals of Solid State Physics I**

Crystal structure, phonons, electronic band structure, metals, insulators and semiconductors.

3 credits, Lecture.

**PHYS 378. Fundamentals of Solid State Physics II**

Optical, magnetic and transport properties. Lattice defects. Non-crystalline solids.

3 credits, Lecture. Prerequisite: PHYS 377.

\* Physics 371, 372, 373, and 374 are offered only through the Physics M.S. Extension Program with an emphasis in optics, which is **not** being offered at the present time.



## PLANT SCIENCE

*Department Head:* Professor Richard A. Ashley  
*Professors:* Adams, Allinson, Berkowitz, Bible, D. Miller, Schroeder, and Singha  
*Associate Professors:* Alexopoulos, Auer, Brand, Civco, Clausen, Corbett, Elliott, McAvoy, Schulthess, and Yang  
*Assistant Professors:* Beck von Bodman, Gaxiola, Guillard, Li, Miniutti, and Morris

The Department of Plant Science offers a broad program of graduate studies leading to M.S. or Ph.D. degrees in Plant Science with emphasis on agronomy and horticulture, and an M.S. with a concentration in Landscape Architecture. Research areas include: agricultural climatology, anatomy, breeding, field crops, floriculture, landscape planning, landscape preservation, landscape plants, plant nutrition, pest management, physiology, morphology, tissue culture, soil science, vegetable crops, and weed science.

A background in appropriate sciences is essential for admission to the master's program. In general, candidates for the M.S. are expected to earn their degree under Plan A (with thesis). Those students with deficiencies in their undergraduate preparation may be expected to include in the plan of study preparatory courses at the undergraduate level. Applicants must present results of the Graduate Record Examinations and three letters of recommendation. These should be sent to: Chair of the Graduate Admissions Committee, Department of Plant Science, U-67, Storrs, Connecticut 06269-4067. In addition to TOEFL scores, the Test of Spoken English (TSE) for international applicants is recommended.

**Special Requirements for the Ph.D. Degree.** Applicants for the doctoral program should have adequate training or experience to enable them to perform independent research. There is no established sequence of required courses, since the program of supporting work depends upon the research project and the candidate's previous experience. However, a minimum of two years of full-time study beyond the master's degree, or the equivalent, is expected.

**Special Facilities.** The department has 190 acres near the main campus in Storrs available for field research with agronomic and horticultural crops. Included are eight acres in experimental nursery stock and 30 acres in fruit crops. Greenhouse facilities cover over 22,600 square feet. Controlled environment facilities and laboratories are instrumented for analytical work. Microcomputers in the department and terminals connecting to the University's Computer Center are available.

### COURSES OF STUDY

**PLSC 300. Advanced Grassland Management**  
 The distribution and management of forage species are discussed. Emphasis is placed on

warm-season grasses. Factors affecting forage quality and the use of forages for silage, hay, and pasture are studied.  
*3 credits, Lecture.*

**PLSC 302. Independent Study**  
*1 - 6 credits, Independent Study. Instructor consent required.*

**PLSC 305. Topics in Plant Science**  
 Topics and credits to be published prior to the registration period preceding the semester offerings.  
*1 - 6 credits, Seminar. Instructor consent required.*

**PLSC 306. Advanced Plant Breeding**  
 An intensive study of those cytological and genetical phenomena having a direct bearing on plant breeding with particular reference to problems involving polyploidy and interspecific hybridization.  
*4 credits, Lecture.*

**PLSC 307. Advanced Study of Economic Plants**  
 A study of anatomical, ecological and other relationships of economic plants.  
*3 credits, Lecture. Instructor consent required.*

**PLSC 308. Advanced Plant Tissue Culture**  
 The use of aseptic techniques for another culture, embryo culture, botanical substance production, protoplast fusion, somatic embryogenesis, meristematic, somaclonal variation and other biotechnological procedures. Emphasis is placed on developmental, physiological and genetic applications.  
*3 credits, Lecture. Instructor consent required.*

**PLSC 335. Current Topics in Plant Biology**  
 Informal discussions of current concepts, research and techniques in the areas of plant biotechnology, plant physiology and molecular biology.  
*1 credit, Lecture.*

**PLSC 343. Plant Biotechnology**  
 Principles of recombinant DNA and plant gene transfer technologies. Applications of plant biotechnology in agriculture, horticulture, forestry, human/animal health care, and the pharmaceutical industry. Social and environmental impacts of plant biotechnology.  
*3 credits, Lecture.*

**PLSC 346. Research Seminar in Landscape Architecture**  
 Readings of major works in the field. Students are required to prepare several papers and present several seminars.  
*3 credits, Seminar. Instructor consent required.*

**PLSC 350. Design and Analysis of Agricultural Experiments**  
 The design and analysis of experiments commonly conducted in agricultural field,

†GRAD 395. Master's Thesis Research  
*1 - 9 credits.*

†GRAD 396. Full-Time Master's Research  
*3 credits.*

†GRAD 397. Full-Time Directed Studies (Master's Level)  
*3 credits.*

GRAD 398. Special Readings (Master's)  
*Non-credit.*

GRAD 399. Thesis Preparation  
*Non-credit.*

†GRAD 495. Doctoral Dissertation Research  
*1 - 9 credits.*

†GRAD 496. Full-Time Doctoral Research  
*3 credits.*

†GRAD 497. Full-Time Directed Studies (Doctoral Level)  
*3 credits.*

GRAD 498. Special Readings (Doctoral)  
*Non-credit.*

GRAD 499. Dissertation Preparation  
*Non-credit.*

greenhouse, and laboratory research. Presentation of summarized data using computer generated graphics from printers, plotters, and film recorders will be covered. Emphasis is placed on use of computers (mainframe and personal) and appropriate computer programs (e.g., SAS, Sigma Plot).  
4 credits, *Lecture. Instructor consent required.*

#### PLSC 351. Crop Ecology

A study of environmental factors as they affect crop growth. Consideration is also given to the interactions between plant populations, both crop plants and weeds under field conditions.  
3 credits, *Lecture. Instructor consent required.*

#### PLSC 372. Advanced Soil Genesis and Taxonomy

Includes an intensive study of theories of soil genesis and the fundamental principles of soil classification. The major system of soil classification in use today is reviewed. A detailed study of the system used by the United States National Cooperative Soil Survey is included. Field trips are required.  
3 credits, *Lecture.*

#### PLSC 375. Soil Physics

The physical properties of soils and their relation to texture and structure; water movement, aeration, and temperature in soils with emphasis on their influence on plant growth.  
3 credits, *Lecture. Instructor consent required.*

#### PLSC 377. Soil Analysis

A study of the theory and practice of analytical methods used in the determination of nutrient and related elements of soil.  
3 credits, *Lecture.*

#### PLSC 378. Advanced Soil Chemistry

Physical chemical characteristics of soil minerals and soil organic matter, and their reactivity with compounds present in the aqueous and vapor phase. Topics include: modern spectroscopic surface analyses, soil organic matter and its interactions with metals, redox reactions, solubility, derivation of ion-exchange equations, and kinetics of soil reactions.  
3 credits, *Lecture. Also offered as ENVE 303.*

#### PLSC 385. Plant Gene Transfer Techniques

Techniques of plant gene delivery and transgenic plant production. Verification and analysis of transgenic plants.  
3 credits, *Laboratory.*

#### †PLSC 397. Seminar

1 credit, *Seminar. Instructor consent required.*

#### †GRAD 395. Master's Thesis Research

1 - 9 credits.

#### †GRAD 396. Full-Time Master's Research

3 credits.

#### †GRAD 397. Full-Time Directed Studies (Master's Level)

3 credits.

#### GRAD 398. Special Readings (Master's)

*Non-credit.*

#### GRAD 399. Thesis Preparation

*Non-credit.*

#### †GRAD 495. Doctoral Dissertation Research

1 - 9 credits.

#### †GRAD 496. Full-Time Doctoral Research

3 credits.

#### †GRAD 497. Full-Time Directed Studies (Doctoral Level)

3 credits.

#### GRAD 498. Special Readings (Doctoral)

*Non-credit.*

#### GRAD 499. Dissertation Preparation

*Non-credit.*

## POLITICAL SCIENCE

*Department Head:* Professor John T. Rourke

*Professors:* Bowman, Boyer, Clifford, Creevey, Farnen, Hanson, Hiskes, Lewis, Reiter, Vengroff, Walker, and Zirakzadeh

*Associate Professors:* Dautrich, Harris, Lefebvre, and Sterling-Folker

*Assistant Professors:* Best, Cole, Donahue, Kelly, Kingstone, Scruggs, Waddell, and Yalof

The Department of Political Science offers study leading to the degrees of Master of Arts and Doctor of Philosophy. Master's degree students usually take a less specialized program, including work in several areas of political science.

**Admission to the Master of Arts Degree Program.** All applicants are required to take the Graduate Record Examinations. Only those applicants showing high scholastic promise are admitted. Usually, an undergraduate major in political science (or an equivalent body of course work) is required for admission. However, exceptions are made for promising candidates who have majored in related subjects. Some undergraduate work in history, economics, and sociology also is desirable. Except where the M.A. degree clearly is intended to be a terminal degree, the admissions committee is reluctant to act favorably in the case of an applicant whose record shows no successful academic exposure to one or more foreign languages.

**Requirements for the Master's Degree.** After fulfilling the requirements for the master's degree, a final examination is administered. The final examination for the M.A. degree is both written and oral.

**Admission to the Ph.D. Degree Program.** Students pursuing the M.A. in Political Science or M.P.A. degree who wish to continue for the Ph.D. degree are admitted to the doctoral program only upon recommendation of the committee administering the M.A. or M.P.A. final examination. Those who have earned the M.A. degree elsewhere are admitted to pursue doctoral work here only with very convincing professional recommendations and demonstrated evidence of scholarly ability. Such applicants also must submit the results of the Graduate Record Examinations.

**Departmental Requirements for the Ph.D. Degree.** The Ph.D. program involves two distinct stages. Doctoral students first prepare for a comprehensive written and oral general examination. After passing this examination, they devote themselves to research and the writing of a dissertation. All doctoral students must prepare in two of the following areas: international relations, comparative politics, American politics, public administration, public law, public policy, public opinion/survey research, and political theory. As part of the Ph.D. general examination process, the student is expected to present a dissertation proposal that is considered by the advisory committee to be ready to defend.

All doctoral students are required to take, as early in their program as possible, Political Science

393, Political Science 395, and Political Science 396.

Ph.D. students are required to have a competent reading knowledge of at least one foreign language appropriate to the general area of study *or*, upon recommendation of the advisory committee, at least six credits of advanced work in a related area or a supporting area such as statistics. However, an advisory committee may require additional advanced work in a related or supporting area, alone or in conjunction with a foreign language.

**Special Facilities.** Students interested in comparative politics will find the Center for Latin American Studies and the Center for Slavic and East European Studies valuable resources. A vast archive of survey data from polls taken both in the United States and abroad is housed at the Roper Center, which is part of the Institute for Social Inquiry. Excellent computer facilities together with expert technical help from the Institute's staff provide ready access to these survey materials.

## COURSES OF STUDY

### **POLS 300. Independent Study in Political Science**

*1 – 6 credits, Independent Study. Instructor consent required.*

### **POLS 301. Political Theory**

Historical and conceptual analysis of selected political ideas such as justice, liberty, rights, political obligation, or the state; including an examination of one or more major schools or bodies of political thought from ancient to contemporary times.  
*3 credits, Seminar.*

### **POLS 304. Proseminar in Political Theory**

Historical survey and analysis of fundamental concepts in political theory.  
*3 credits, Seminar.*

### **POLS 307. Seminar in American Thought and Ideology**

*3 credits, Seminar.*

### **POLS 311. Proseminar in International Relations**

Current theories of and methodological approaches to international relations.  
*3 credits, Seminar.*

### **POLS 313. Seminar in American Diplomacy**

Problems in American diplomacy and foreign policy.  
*3 credits, Seminar.*

### **POLS 315. Capstone in Public Administration I**

Development of the research question, bibliography, and methodology for the capstone project.  
*3 credits, Seminar.*

### **POLS 316. Capstone in Public Administration II**

Research and writing of the capstone project.  
*3 credits, Seminar.*

### **POLS 317. Capital Financing and Budgeting**

Examination of the municipal bond market, capital budgeting techniques, and related public policy issues.  
*3 credits, Seminar.*

### **POLS 318. Financial Management for Public and Nonprofit Organizations**

Management of financial resources in public service organizations. Topics include variance analysis, public sector and nonprofit accounting, financial statement analysis, and forecasting.  
*3 credits, Seminar.*

### **POLS 319. Program Development and Evaluation**

Techniques for evaluating and improving organizational performance and the ability to deal with the challenges posed by changing environments. Topics include strategic planning, program development, program implementation, evaluating effectiveness, and performance measurement and improvement.  
*3 credits, Seminar.*

### **POLS 320. Administrative Ethics**

Examination of models and standards of ethics in public administration, decision-making techniques and tools, and analyses of selected, contemporary dilemmas confronting public administration and public policy.  
*3 credits, Seminar.*

### **POLS 321. Foreign Policies of the Russian Federation and the Former USSR**

Regional and global roles of the former USSR and post-Communist Russia.  
*3 credits, Seminar.*

### **POLS 323. International Conflict and Cooperation**

Examination of theories and methodologies relating to the study of international conflict and cooperation. Topics include deterrence, negotiation and bargaining, theories of conflict and war, and approaches to conflict resolution.  
*3 credits, Seminar.*

### **POLS 324. International Business and World Politics**

Major problem areas in which politics, economics, and business intersect at the international level - trade, foreign investment, and monetary relations. The politics and mechanisms of U.S. foreign economic policy.  
*3 credits, Seminar.*

### **POLS 325. Foreign Policy Analysis**

Analysis of foreign policy processes from a comparative, theoretical perspective.  
*3 credits, Seminar.*

### **POLS 326. International Organization**

Methods of international cooperation for the preservation of peace and for dealing with economic, social, and political problems down to the present time.  
*3 credits, Seminar.*

### **POLS 328. U.S. Foreign Policy in the Middle East**

Examination of U.S. political, economic and strategic interests and aims in the Middle East.  
*3 credits, Seminar.*

### **POLS 329. Politics and Security in the Middle East**

Examination of security issues in the Middle East and the responses of regional actors and external powers.  
*3 credits, Seminar.*

### **POLS 330. Seminar in Comparative East Asian Politics**

Processes of development, modernization, and administrative techniques of economic development in East Asia against the background of revolutionary changes in the People's Republic of China.  
*3 credits, Seminar.*

### **POLS 331. West European Politics**

Contending approaches to the political systems of West European nations. Comparative analysis of industrialization, institutional structure, and political economy.  
*3 credits, Seminar.*

### **POLS 332. Seminar in Latin American Politics**

*3 credits, Seminar.*

### **POLS 335. Proseminar in Comparative Government**

Political institutions and processes compared. Derivation of generalizations.  
*3 credits, Seminar.*

### **POLS 336. Comparative Political Development**

Development of political systems in relation to socio-economic level and other conditioning factors. Political stability and change.  
*3 credits, Seminar.*

### **POLS 337. Politics of Russia and the Former Soviet Union**

Analysis of the collapse of political authority in the former Soviet Union and the process of political development in post-Communist Russia. Comparison of Soviet/Russian political attitudes and behavior with that of other industrial societies.  
*3 credits, Seminar.*

### **POLS 339. Seminar in African Politics**

Focus on the rise of nationalism in post-war Africa, the process of decolonization, and the problems of economic growth and national



integration. Attention will also be given to the role of ideology as a determinant in the choice of development policies.  
*3 credits, Seminar.*

**POLS 340. East European Politics**

Comparative analysis of the political development, economic modernization, social stratification, and indigenous ideologies of post-Communist Eastern Europe.  
*3 credits, Seminar.*

**POLS 341. Public Opinion and American Democracy**

Theories of democracy and what they imply about the public's capabilities and role; empirical research on the American public and public opinion in the context of democratic theory.  
*3 credits, Seminar.*

**POLS 342. American Political Parties**

The development, organization, and role of political parties in the United States, with implications for public policy.  
*3 credits, Seminar.*

**POLS 345. Politics, Society, and Educational Policy**

The analysis of the interactions among educational policy, politics and other social forces. In-sights and concerns from politics and other social sciences disciplines will be applied to different levels and types of schooling.  
*3 credits, Seminar.*

**POLS 346. Proseminar in Public Policy**

Major works in U.S. public policy, with comparative illustrations of general principles.  
*3 credits, Seminar.*

**POLS 347. State and Substate Political Systems**

*3 credits, Seminar.*

**POLS 348. Connecticut State Government and Administration**

Structure, organization and functioning of Connecticut's state government. Management and administrative issues in the executive, legislative and judicial branches.  
*3 credits, Seminar.*

**POLS 351. Constitutional Interpretation**

An exploration of the theories and process of constitutional interpretation in the United States, with an emphasis on the role the Supreme Court plays in defending and enforcing civil liberties.  
*3 credits, Seminar.*

**POLS 352. Seminar in Public Law**

Selected topics in public law, the administration of justice, and jurisprudence.  
*3 credits, Seminar.*

**POLS 353. Judicial Decision-Making**

The judicial decision-making process in terms of

methods and models developed in the framework of the behavioral sciences.

*3 credits, Seminar.*

**POLS 358. Administrative Law**

The basic legal framework of administrative organization and the rules governing administrative powers and their exercise; also the legal procedures for the enforcement of bureaucratic responsibility in the democratic state.

*3 credits, Seminar.*

**POLS 360. Proseminar in Public Administration**

Theory and structure of administration and the public service.

*3 credits, Seminar.*

**POLS 361. Theory of Public Organization**

An examination of organization theory and research findings; their relation to public organizations.

*3 credits, Seminar.*

**POLS 362. Organizations & Management**

The application of organization theory and research findings; their relation to public organizations.

*3 credits, Seminar.*

**POLS 363. Administrative Functions of Local Government**

An examination of the characteristic managerial problems of the several functions of local government such as police, fire, traffic, public works, parks, health, recreation. The course is designed for individuals planning to work with citizen agencies, in agencies for governmental management, or in journalism.

*3 credits, Seminar.*

**POLS 364. Governmental Financial Administration**

Techniques, practice, and organization of the financial functions in governmental administration, including revenues administration, fund operation, debt operations, records administration, purchasing, audits, and financial reports.

*3 credits, Seminar.*

**POLS 365. Human Resource Management**

The structures, processes, and principles of human resource management and labor-management relations in the public service, and examination of contemporary human resource policies and challenges.

*3 credits, Seminar.*

**POLS 366. Organizational Politics and Policy Development**

Analysis of the policy making process at the federal level.

*3 credits, Seminar.*

**POLS 367. Problems in Intergovernmental Administration**

Examination of intergovernmental relations as an

administrative system, with emphasis on current problems.

*3 credits, Seminar.*

**POLS 368. Development Administration**

Strategies of implementing development in Latin America, Asia, and Africa; social, political, and cultural obstacles to administrative reform in developing nations; problems of technical assistance in overseas administration; theories of development administration.

*3 credits, Seminar.*

**†POLS 369. Supervised Internship**

Experience in a public organization under competent supervision.

*6 credits, Practicum. Open only to students in the Master of Public Administration program.*

**POLS 370. Applied Methods I**

Research design for organizational management and policy analysis and evaluation. How to communicate, execute and evaluate research. Skills in selecting appropriate analytic procedures and properly interpreting and reporting results.

*3 credits, Seminar.*

**POLS 371. Urban Management and Politics**

Analysis of urban political systems. Emphasis on both theoretical analysis of political structures and knowledge of urban problems and proposed solutions.

*3 credits, Seminar.*

**†POLS 372. Introduction to Public Administration Skills**

Provides basic skills and competencies important to completing the MPA program and for future professionals in the public service.

*1 credit, Seminar.*

**POLS 373. Public Budgeting**

An examination of the development and structure of the public financial sectors; the principles and roles of operating and capital budgets in public organizations; and introduction to the relationships between funding mechanisms and public policy.

*3 credits, Seminar.*

**POLS 374. Planning and Land Use**

A consideration of alternative approaches to planning, with emphasis on legal and political issues in communities and organizations.

*3 credits, Seminar.*

**POLS 375. Politics of Organization and Bureaucracy**

*3 credits, Seminar.*

**POLS 376. Applied Methods II**

Statistical reasoning, tools, and techniques for effective public management.

*3 credits, Seminar. Open only to students in the Master of Public Administration program.*

**POLS 377. Complex Systems Management**

Multi-organizational systems settings in managing delivery and public services, the administrative dimensions of large-scale public/private endeavors.

*3 credits, Lecture.*

**POLS 378. Computer Applications in Administration**

Introduction to computers as currently used by managers and analysts in the public sector. Adaptation of computer software to the analysis of problems of state, local and national significance, integrating concepts of benefit-cost analysis, risk management, decision analysis, and statistics.

*3 credits, Seminar.*

**POLS 379. Principles and Methods of Survey Research**

Exploration of the theory and practice of survey research, including sampling, questionnaire design, analysis and reporting results.

*3 credits, Seminar.*

**POLS 380. The Practice of Survey Research**

The practice and use of survey research in the United States and throughout the world. The structure, culture and professional norms of the survey community. The role of public opinion polling in government and public policy-making.

*6 credits, Seminar.*

**POLS 381. Proseminar in American Politics**

Theory and practice of American government and politics, with an emphasis on various theoretical and methodological perspectives.

*3 credits, Seminar.*

**POLS 384. National Decision-Making Process: Presidency and Congress**

The interaction of the institutionalized Presidency and the Congress in the formulation and execution of public policy. Emphasis given to current issues and problems.

*3 credits, Seminar.*

**POLS 385. Politics of Federal Organization**

*3 credits, Lecture.*

**POLS 386. Public Opinion and Public Policy**

Theoretical and empirical study of public opinion and its role in policy formation.

*3 credits, Seminar.*

**POLS 391. Public Policy Analysis**

Methods of empirically evaluating public policies.

*3 credits, Seminar.*

**POLS 393. Nature of Political Inquiry**

The scope of political science, modes of inquiry, the role of concepts and theory. Graduate students are urged to take the course in their first semester.

*3 credits, Seminar.*

**POLS 394. Social Policy**

*3 credits, Seminar.*

**POLS 394. Social Policy**

Examination of the concepts and principles of public policy analysis, with applications to important social issues.

*3 credits, Seminar.*

**POLS 395. Seminar in Quantitative Methods of Political Science**

Introduction to the data analysis techniques most often used by political scientists. Requires no previous background in statistics.

*3 credits, Seminar.*

**POLS 396. Research Design in Political Science**

Introduction to non-quantitative methods in political science research.

*3 credits, Seminar.*

**POLS 397. Investigation of Special Topics in Political Science**

*1 - 3 credits, Seminar.*

**†GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

**†GRAD 396. Full-Time Master's Research**

*3 credits.*

**†GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

**POLS 401. Research Seminar in Political Theory**

Investigation of special topics in political theory, with emphasis on the preparation and completion of original research projects.

*3 credits, Seminar.*

**POLS 411. Research Seminar in International Relations**

*3 credits, Seminar.*

**POLS 429. International Politics in East Asia**

China, Japan, Russia, and the United States in East Asia; comparative policy making processes, the relationship between perception and policy outcome, and the linkage between national and international systems.

*3 credits, Seminar.*

**POLS 431. Research Seminars in Comparative Politics**

*3 credits, Seminar.*

**POLS 441. Research Seminars in American Politics**

*3 credits, Seminar.*

**POLS 451. Research Seminar in Judicial Process**

*3 credits, Seminar.*

**POLS 461. Research Seminar in Public Administration**

*3 credits, Seminar.*

**POLS 471. Research Seminar in Comparative Public Policy**

Comparative analysis of particular public policies. Countries and policies considered may vary from year to year.

*3 credits, Seminar.*

**POLS 493. Research Seminar in Quantitative Methods**

Research in quantitative applications to political data.

*1 - 6 credits, Seminar. Prerequisite: POLS 395 or POLS 376.*

**POLS 496. Special Topics in Public Policy**

*3 credits, Lecture.*

**†GRAD 495. Doctoral Dissertation Research**

*1 - 9 credits.*

**†GRAD 496. Full-Time Doctoral Research**

*3 credits.*

**†GRAD 497. Full-Time Directed Studies (Doctoral Level)**

*3 credits.*

**GRAD 498. Special Readings (Doctoral)**

*Non-credit.*

**GRAD 499. Dissertation Preparation**

*Non-credit.*

## POLYMER SCIENCE

*Program Director:* Professor Robert A. Weiss

*Professors:* Huang, Shaw, and Sung

*Research Professor:* Scola

*Associate Professor:* Papadimitrakopoulos, Parnas, and Seery

*Assistant Professors:* Asandei, Dobrynin, Mather, Sotzing, Utz, and Zhu

*Adjunct Professors:* Ambrosio, Chapoy, and Han

Work leading to the degree of Master of Science and Doctor of Philosophy is offered in the interdisciplinary field of polymer science in the Institute of Materials Science.

**Admission to Degree Programs.** In addition to the basic admission requirements of the Graduate School, an applicant should submit Graduate Record Examinations (GRE) General Test scores at the time of application. A sound undergraduate major in science and/or engineering normally is required for entrance to the degree programs.

**The M.S. Program.** Other than the GRE General Test scores, there are no special requirements for admission to the master's program beyond those of the Graduate School. Selection of Plan A (thesis) or Plan B (non-thesis) is made after consultation with the advisory committee.

**The Ph.D. Program.** Admission to the doctoral program is based upon a careful assessment of the student's potential for creative research in polymer science. There are no special requirements for the doctoral program beyond those of the Graduate School, other than the GRE General Test scores.

**Facilities.** The Institute of Materials Science, (IMS) has well-equipped, environmentally controlled research laboratories that are continually being upgraded. These include a clean room for surface and interface research, a monochromic source, variable angle ESCA, a relaxation spectrophotometer, and a tuneable UV/visible pulsed Nd:YAG laser. The IMS Microscopy Laboratory has a new JEOL 6335F cold field emission gun SEM with an automated digital interface and a fully automated digital JEOL 2010 FasTEM. The polymer processing area includes a Brabender Prep Center, a Brabender Plasti-Corder torque rheometer, twin screw extruder/mixer, pelletizer, and an injection molding machine. Among recently acquired instruments and facilities particularly relevant to polymer research are a Rheometrics ARES controlled strain rheometer, a PAAR Physica UDS-200 controlled stress rheometer and a Rheometric System IV, H/P 5890 and H/P 6890 Gas Chromatograph/Mass Spectrometers, and a Bruker GADDS wide-angle diffraction instrument, Bruker D5005 and D8 Advance power diffractometers, a Bruker Anton-Parr, a Renishaw Ramascope System, a Nicolet Magna 560 FT/IR, TA Instruments STA 600, T6A 500, and DSC 100. There are many other large and small instruments too numerous to list.

The Institute also operates a state-of-the-art materials simulation laboratory with a parallel cluster based on more than 24 PCs of the latest architecture.

Students also have access to the main University computer system, as well as dozens of PCs, Macs, and Unix work stations.

### COURSES OF STUDY

Course offerings are shown below. These are co-sponsored by departments in the sciences and engineering. Special Topics (Chemistry 394, Chemical Engineering 320) are offered each semester. The subject of these courses varies widely and depends on student and faculty interest and availability. In addition, the program sponsors weekly seminars of outstanding speakers representing various study areas in polymer science and technology. Visiting faculty frequently contribute extensively to these courses. Topics offered have included Liquid Crystals, Inorganic Polymers, and Lifetime Prediction of Materials.

#### Chemical Engineering

- 351. Polymer Physics
- 352. Polymer Properties
- 355. Polymer Structure and Morphology
- 356. Adhesion
- 357. Surface and Interfacial Properties of Polymers
- 358. Composite Materials
- 367. Polymer Rheology
- 368. Polymer Rheology and Processing Laboratory

#### Chemistry

- 380. Polymer Synthesis
- 381. Polymer Physical Chemistry
- 382. Polymer Characterization I
- 384. Polymer Characterization II
- 385. Reactions of Polymers
- 386. Microscopy and Morphology of Polymers
- 394. Investigation of Special Topics
  - Inorganic Polymers
  - Polymer Biomaterials
  - Polymer Photonics
  - Polymer Spectroscopy

#### Molecular and Cell Biology

- 313. Structure and Function of Biological Macromolecules
- 315. X-ray Structure Analysis

#### Physics

- 363. The Electrical Properties of Polymers

## PSYCHOLOGY

*Department Head:* Professor Charles A. Lowe

*Professors:* Allen, Carello, Crawford, Dickerson,

Fein, Fisher, Fowler, Green, Johnson,

Kalichman, Katz, Kenny, Kirsch, Lillo-Martin,

Maxson, Miller, Rickards, Salamone, Schwarz,

Shaw, Swadlow, and Turvey

*Associate Professors:* Barnes-Farrell, Cillessen,

Growney, Gustafson, Henning, Holzworth,

Markus, Marsh, Mellor, Naigles, Park, Pratto,

Rueckl, and Williams

*Associate Clinical Professor:* Barton

*Assistant Professors:* Agocha, Bessenoff, Chrobak,

Dixon, Kay, Magley, Quinn, Tabor, and Treadwell

*Adjunct Professor:* Snyder

The Department of Psychology offers study leading to the degree of Doctor of Philosophy in the several areas described below. There is a pervading emphasis on the acquisition of a general background in experimental findings and theoretical interpretations. All students conduct independent experimental projects prior to research for the dissertation. Opportunities are provided for preprofessional experience in teaching, research on grant-supported projects, and with clinical agencies. The Departmental website is <http://psych.uconn.edu>.

**Behavioral Neuroscience.** This area of concentration offers study that focuses on the biological basis of behavior, through research participation, seminars, and formal course work. Research programs make use of a variety of approaches – of neurophysiology, neurochemistry, neuroanatomy, neuroendocrinology, genetics, ethology, and behavioral analysis – to study problems in sensation, perception, emotion, motivation, learning, motor activity, aggression, sex differences, reproductive behavior, communication, brain lateralization, and the organization of sensory cortex.

**Clinical Psychology.** The clinical program is designed to produce psychologists able to work on a scientific and professional level, with special competence in research, diagnosis, and therapy. At least one year of internship at an approved facility is required. The program has APA certification.

**Cognition/Instruction.** This area of concentration bridges the gap between psychological theory and research and educational practice. Training includes courses in research and theory in sensation and perception, action theory, learning and cognition, social cognition, cognitive development and instructional theories and models derived from behavioral and cognitive psychology. Additionally, research experiences are provided both at the University as well as in more applied settings.

**Developmental Psychology.** Training in the conduct of research and the analysis of theory in child and developmental psychology is superimposed on a broad background in general psychology. Areas given emphasis include cognitive development, computer modeling, developmental



behavior genetics, intelligence, language, learning, mental retardation, and motivation.

**General Experimental Psychology.** Three areas of specialized study are offered: (1) the ecological approach to perception and action, (2) language and cognition, and (3) visual and auditory perception and learning. Facilities exist for research and training on many topics, including: the perceptual control of action, coordinated movement, psycholinguistics, speech perception and production, neurobiological and psychophysical studies, and the philosophical and theoretical foundations of perception, action, and cognition. Emphasis in psycholinguistics is provided in cooperation with the Department of Linguistics.

**Industrial/Organizational Psychology.** This area of concentration is concerned with the application and extension of psychological facts, methods, and principles to the problems of business, government and industry. The program has two areas of emphasis: (1) personnel organization psychology, and (2) human factors/ergonomics. All students take the same core courses in the first year of study. A one-year internship at an approved facility is required.

**Neurosciences.** This is an interdisciplinary area of concentration. Neuroscience is concerned with the structural and functional characteristics of the nervous system and its relation to the adaptive physiology and behavior of the organism. Students in this program may approach the full range of neuroscience studies through courses and research at the cellular, systemic, and organismic levels. A particular strength of the area is the analysis of behavior, its development, and its neurological bases. This area of concentration is offered in the fields of study of biobehavioral science, pharmaceutical science, physiology, and psychology. Application is made to the preferred field of study, but the applicant must be acceptable to the Neurosciences Committee.

**Social Psychology.** This area of concentration is designed to train psychologists to carry out research in both laboratory and field settings. A comprehensive program of training is offered in research skills necessary for experimental and quasi-experimental research designs. Areas of emphasis include social and personality development, attitude formation theory and interpersonal attraction, prosocial behavior, social comparison and small group behavior, organizational psychology, and environmental psychology.

**Admission Requirements.** Well qualified candidates are encouraged to apply for the Ph.D. degree. A small number of terminal M.A. degree candidates may be accepted in the area of general experimental psychology. Acceptance to an M.A. program does not insure admission to the Ph.D. program. Reapplication is required.

Requirements for admission include basic courses in statistics, general psychology, and experimental psychology. Applicants must present scores on three parts of the Graduate Record Examinations: Verbal Aptitude, Quantitative Aptitude, and Advanced Test in Psychology.

Application forms for admission and for financial support may be obtained by writing to the Graduate Admissions Office. The application deadline for Clinical Psychology is January 2. The deadline for all other Psychology graduate programs is January 15. For questions regarding graduate programs, please call (860) 486-3528 or send an e-mail message to <futuregr@psych.psy.uconn.edu>.

**Facilities.** Research facilities include: minicomputer and microcomputer based laboratories for industrial, neurobiological, psycholinguistic and perceptual studies; local network access to the University's mainframe; laboratories for comparative and physiological research with avian and mammalian species; laboratories in affiliated research institutions, including the Haskins Laboratories in New Haven, and the University-operated nursery school.

A variety of approved centers are available for practicum and intern training in clinical psychology, and for work experience for advanced students. These resources include a variety of Veterans' Administration, general and mental hospitals, educational and community clinics, trauma centers, and opportunities for work with developmentally disabled individuals living in the community.

## COURSES OF STUDY

### PSYC 300. Independent Study

1 – 6 credits, *Independent Study. Instructor consent required.*

### PSYC 301. Special Topics in Psychology

Selected topics in psychology are studied with particular attention to recent developments in the field.  
1 – 6 credits, *Seminar. Instructor consent required.*

### PSYC 302. Practicum in Interviewing and Cognitive Assessment

An introduction to psychological assessment with supervised practice in administering and interpreting clinical interviews and psychological tests.  
3 credits, *Practicum.*

### PSYC 303. Adult Psychopathology

Theoretical and descriptive overviews of mental disorder that afflict adults, emphasizing etiology, diagnosis, and conceptualization.  
3 credits, *Lecture. Instructor consent required.*

### PSYC 304. Research in Psychology

1 – 6 credits, *Independent Study. Instructor consent required.*

### PSYC 305. Research Seminar in Language and Psychology

1 credit, *Seminar. Also offered as LING 305.*

### PSYC 306. Professional Issues in Clinical Psychology

An examination of the relations among the law, ethical issues, and professional practices of clinical psychologists and of other providers of mental health services.  
3 credits, *Lecture. Instructor consent required.*

### PSYC 307. Child Psychopathology

An examination of diagnosis, etiology, and prognosis in child psychopathology.  
3 credits, *Lecture. Instructor consent required.*

### PSYC 308. Social and Personality Development

Fundamental research and theory on social behavior, social cognition, and interpersonal relations in the preschool period (2-6 years) and in middle childhood (6-12 years). Early childhood precursors and consequences in adolescence. Both normative and atypical development.  
3 credits, *Seminar. Instructor consent required.*

### PSYC 310. Practicum in Personality Assessment

Supervised practice in administration and interpretation of clinical tests and case history material, report writing and discussion of implications of diagnostic data for therapeutic procedures.  
3 credits, *Practicum.*

### PSYC 311. Psychodynamics

Criteria for the evaluation of personality theories. An analysis of the major methods of psychotherapy and of the personality theories on which they are based.  
3 credits, *Lecture. Instructor consent required.*

### PSYC 312. Ecology of Language

The scope and content of an ecological theory of language are outlined. Conventional theories of language, ecological theories of perceiving and acting and relevant portions of social psychological, anthropological, and linguistic theory are explored.  
3 credits, *Lecture. Instructor consent required.*

### PSYC 313. Memory

Contrasts associationist, cognitive, connectionist, and cognitive neuroscience approaches to issues involving short-term memory, long-term memory, and the representation of knowledge.  
3 credits, *Lecture. Instructor consent required.*

### PSYC 314. The Mental Lexicon

The role of the mental lexicon in the perception and production of words, including the representation and use of knowledge about phonology, morphology, orthography, and semantics.  
3 credits, *Lecture. Instructor consent required.*

### PSYC 315. Connectionist Models

Connectionist models in psychology and computational neuroscience. Topics include learning, memory, and language processes in both intact and damaged networks.  
3 credits, *Lecture. Instructor consent required.*

**PSYC 316. Empirically Validated Methods of Psychotherapy**

Instruction and supervised practice of empirically validated, psychotherapeutic techniques and treatments.

*3 credits, Lecture. Instructor consent required. Prerequisite: PSYC 323.*

**PSYC 317. Integrative Treatment with Special Populations**

Psychotherapeutic interventions with alcohol and drug abusers, abused children and their parents, people with HIV/AIDS, and with paraphilias and sexual dysfunctions.

*3 credits, Lecture. Prerequisite: PSYC 323.*

**PSYC 318. Didactics of Supervision and Consultation**

Exposure to theories, models, and empirical data pertinent to providing quality supervision of the psychodiagnostic and psychotherapeutic activities of mental health professionals.

*3 credits, Lecture. Open to students in Clinical Psychology. Prerequisites: PSYC 302, PSYC 310, PSYC 330, and PSYC 331.*

**PSYC 319. Practicum in Clinical Supervision**

Supervised training in supervising psychodiagnostic and psychotherapeutic activities of less advanced clinical psychology students.

*3 credits, Practicum. Open to students in Clinical Psychology. Prerequisites: PSYC 302, PSYC 310, PSYC 330, and PSYC 331.*

**PSYC 320. Seminar in Clinical and Abnormal Psychology**

*3 credits, Seminar. Instructor consent required.*

**PSYC 321. Research Design and Test Construction**

Theoretical issues and practical problems in developing valid measures of personality variables and in designing experimental and quasiexperimental research.

*3 credits, Lecture. Instructor consent required.*

**PSYC 322. Psychology of Personality**

An evaluation of current problems, theories, and research in personality. Emphasis is on normal rather than pathological implications of various theoretical approaches.

*3 credits, Lecture. Instructor consent required.*

**PSYC 323. Foundational Methods of Psychotherapy**

Application of foundational methods of psychotherapeutic interventions from humanistic-experiential and interpersonal-systems theories.

*3 credits, Lecture. Instructor consent required. Prerequisite: PSYC 311.*

**PSYC 324. Group Psychotherapy**

Theories and methods of group psychotherapy.

*3 credits, Lecture.*

**PSYC 325. Foundations in Neuropsychology**

An introduction to neuropsychology, including functional neuroanatomy, neurochemistry, neuropharmacology and cognitive/emotional function and dysfunction.

*3 credits, Lecture.*

**PSYC 326. Neuropsychological Assessment**

An introduction to clinical neuropsychological assessment, including review of neuroanatomy and neuropsychological functions, common syndromes of neuropsychological dysfunction, specific tests to measure neuropsychological functions and professional issues for the neuropsychologist.

*3 credits, Lecture. Instructor consent required. Prerequisite: PSYC 325.*

**PSYC 327. Practicum in Neuropsychological Assessment**

Field placements in clinical neuropsychology. Students will be placed in area hospitals, rehabilitation centers, or on campus, where they will perform neuropsychological evaluations under supervision and attend clinical rounds and team meetings.

*3 credits, Practicum. Instructor consent required. Prerequisites: PSYC 302, PSYC 325, and PSYC 326.*

**†PSYC 329. Clerkship in Clinical Methodology**

Supervised clinical training in a community facility.

*1 – 6 credits, Practicum.*

**†PSYC 330. Practicum in Adult Psychotherapy**

Supervised psychotherapy training with adults including diagnostic procedures.

*3 credits, Practicum. Open to students in Clinical Psychology.*

**†PSYC 331. Practicum in Child Psychotherapy**

Supervised psychotherapy training with children and parents including diagnostic procedures.

*3 credits, Practicum. Open to students in Clinical Psychology.*

**PSYC 332. Developmental Ethology**

Introduction to conceptual, theoretical, and empirical issues based upon an ethological and biopsychological approach to development across species. Topics include nature-nurture, behavioral embryology, early experience, continuity-discontinuity, and performativism versus epigenesis.

*3 credits, Lecture. Instructor consent required.*

**PSYC 333. Cognitive Development**

Current theory and research on children's conceptual development.

*3 credits, Lecture. Instructor consent required.*

**PSYC 335. Special Topics in Developmental Psychology**

Selected topics in developmental psychology are studied with particular attention to current

research and theoretical trends.

*3 credits, Seminar. Instructor consent required.*

**PSYC 336. Advanced Child Psychology**

This course undertakes, at an advanced level, a developmental treatment of child behavior on the basis of experimental findings and psychological theory.

*3 credits, Lecture. Instructor consent required.*

**PSYC 337. Advanced Social Psychology**

An overview of the field of social psychology organized around the major underlying theoretical orientations. Several positions are critically examined along with representative empirical work.

*3 credits, Lecture. Open to Social Psychology graduate students, others with permission.*

**PSYC 338. Development of Language and Related Processes**

Experimental and descriptive study of the child's language processes, with emphasis on acquisition, structure, meaning, thought, and the influence of verbal processes on nonverbal behavior.

*3 credits, Lecture. Open to Psychology graduate students, others with permission.*

**PSYC 339. Infancy and the Effects of Early Experience**

Data and theory concerning the effects of early experience in infancy on behavioral and physiological development. Cross-species comparisons are emphasized.

*3 credits, Lecture. Instructor consent required.*

**PSYC 340. Motivation**

Theories of motivation considered in relation to their supporting data.

*3 credits, Lecture. Instructor consent required. Also offered as COMS 340.*

**PSYC 341. Reading Acquisition and Reading Disorders**

Examination of theories and research: Aspects of literacy and stages of acquisition; cognitive prerequisites for reading and writing; individual differences in learning and the problem of dyslexia.

*3 credits, Lecture.*

**PSYC 342. Experimental Social Psychology**

A critical overview of the various laboratory methods and techniques in social psychology.

*3 credits, Seminar. Instructor consent required.*

**PSYC 343. Intergroup Relations**

Marxism, social identity theory, realistic group conflict theory, elite theory, equity theory, relative deprivation, authoritarian personality, social dominance theory and evolutionary theory as it pertains to intergroup and gender relations.

*3 credits, Lecture.*

**PSYC 344. Psychology of Women and Gender**

A survey of research and theory on the interpretation of sex differences; gender, status, and power, and women's life span development. *3 credits, Lecture.*

**PSYC 345. Applied Social Psychology**

Different areas of applied social psychology will be examined in different semesters. Possible foci include Psychosocial Aspects of the AIDS Epidemic, and Organizational Change. *3 credits, Lecture. Instructor consent required.*

**PSYC 346. Current Topics in Social Psychology**

Topics vary by semester. Recent topics have included Social Cognition, Small Groups, Health Psychology, Emotion, Problems in Personality, and Ecological Social Psychology. *3 credits, Seminar. Instructor consent required.*

**PSYC 348. Field Research Methods**

An examination of various methods of field research, focusing on design, analysis, theory, and practical issues. *3 credits, Seminar. Prerequisite: PSYC 342.*

**PSYC 349. Causal Modeling in Social Psychology**

The analysis of data to test causal theories, the use of factor analysis to test models of measurement, and the comparison of alternative models is discussed. *3 credits, Lecture. Prerequisite: STAT 379.*

**PSYC 350. Cerebral Mechanisms in Perception**

Knowledge and principles of neural organization related to attention, sensory processing, perception and cognition. *3 credits, Lecture. Instructor consent required.*

**PSYC 351. Neural Foundations of Learning and Memory**

Examination of the processes involved in habituation, conditioning, learning, and memory through a study of the neural elements and systems involved in their production and maintenance. *3 credits, Lecture. Instructor consent required.*

**PSYC 352. Biopsychology of Motivation and Emotion**

Neural basis of motivated and emotional behavior with special emphasis on the limbic system. *3 credits, Lecture. Instructor consent required.*

**PSYC 353. Introduction to Nonlinear Dynamics**

Basic concepts and methods of nonlinear dynamics systems theory applied to behavioral time-series data. *3 credits, Lecture. Instructor consent required.*

**PSYC 354. Seminar in Animal Behavior**

*1 – 6 credits, Seminar. Instructor consent required.*

**PSYC 355. Physiological Psychology**

A survey of research findings on the physiological and anatomical process underlying sensory and motor functions, emotion and motivation, learning and thinking. *3 credits, Lecture. Instructor consent required.*

**PSYC 356. Behavioral Neuroscience Research Seminar**

Seminar on current research, with intra- and extra-mural colloquium speakers. *2 credits, Seminar. Instructor consent required.*

**PSYC 357. Physiological Psychology Laboratory**

Techniques used in the study of physiological psychology, including ablation, electrical and chemical stimulation, and electrophysiological recording of the nervous system. *3 credits, Laboratory. Instructor consent required.*

**PSYC 358. Selected Topics in Physiological Psychology**

Special problems or areas of research are studied with particular attention to recent developments in the field. *1 – 6 credits, Lecture. Instructor consent required.*

**PSYC 359. The Neuropsychology of Language**

An examination of language and speech in relation to the biological systems that serve communicative processes in man. *3 credits, Lecture. Instructor consent required.*

**PSYC 360. Advanced Nonlinear Dynamics for the Behavioral Sciences**

Advanced concepts and methods of nonlinear dynamics systems theory applied to behavioral time-series data. *3 credits, Lecture. Instructor consent required. Prerequisite: PSYC 353.*

**PSYC 361. Animal Behavior**

A survey of the scientific study of animal behavior, with an emphasis on evolutionary and developmental mechanisms underlying non-human behavior patterns. *3 credits, Lecture. Instructor consent required.*

**PSYC 362. Laboratory in Animal Behavior**

*3 credits, Laboratory. Instructor consent required.*

**PSYC 363. Learning and Related Behavior Processes**

Analysis of learning theories and the data of classical and instrumental conditioning. *3 credits, Lecture. Instructor consent required.*

**PSYC 364. Dynamics of Language**

Application of dynamical systems theory to language modeling. *3 credits, Lecture.*

**PSYC 365. Perceptual Information Processing**

Perceptual behavior interpreted as the processing of sensory information. *3 credits, Lecture. Instructor consent required.*

**PSYC 366. Psychological Theory and Measurement**

An examination of the nature of psychological concepts and theory. What is measured and what does it mean. *3 credits, Lecture. Instructor consent required.*

**PSYC 367. Cognition**

An introduction to theories of human cognition. *3 credits, Lecture.*

**PSYC 368. Psychology of Language**

Psychological aspects of linguistic structure, with particular attention to phonology. *3 credits, Seminar. Instructor consent required.*

**PSYC 369. Sensation and Perception I**

Relations among physical, physiological, and psychological variables in selected sensory and perceptual processes. Attention is given to problems of measurement, empirical findings, and theoretical interpretations. *3 credits, Lecture. Instructor consent required.*

**PSYC 370. Sensation and Perception II**

A continuation of Psychology 369. *3 credits, Lecture. Prerequisite: PSYC 369.*

**PSYC 371. Interpersonal Relations**

The study of affect, cognition, and behavior in two-person relationships. *3 credits, Lecture. Prerequisite: PSYC 342.*

**PSYC 372. Attitude Organization and Change**

An overview of the field of attitude theory and research focusing on problems of attitude formation, attitude organization, and attitude change. *3 credits, Lecture. Open to Psychology graduate students, others with permission.*

**PSYC 373. Selected Topics in Visual Perception**

The data and theories in pattern perception, motion perception, color vision, electrophysiology, and the effects of early visual experience. *3 credits, Lecture. Instructor consent required.*

**PSYC 374. Control and Coordination of Action**

Covers the ecological approach; movement as the product of a representational/computational system; intentionality; physical principles of self-organization and cooperativity; task dynamics. Problems in the physiology of activity, prosthetics and robotics are addressed. *3 credits, Lecture. Instructor consent required.*

**PSYC 375. Introduction to Cognitive Systems**

Survey of the fundamental concepts of machine theory, cybernetics, structural stability theory, and natural systems theory with respect to their role in modeling cognitive systems. *3 credits, Lecture. Instructor consent required.*



**PSYC 376. Special Topics in Cognitive Systems Theory**

Special topics in cognitive systems theory are reviewed with particular emphasis on techniques for the intrinsic measurement of systems behavior including information processing capacities and goal achievements. Students are required to apply the techniques discussed to an ongoing research topic of their own choosing. *3 credits, Lecture. Instructor consent required.*

**PSYC 377. Current Topics in Industrial/Organizational Psychology**

Selected topics in industrial/organizational psychology are studied with particular attention to current research and theoretical trends. Topics vary by semester. *3 credits, Seminar. Instructor consent required.*

**PSYC 378. Work Motivation**

Major theoretical approaches to work motivation, and their implications for the design of work settings and the treatment of workers. *3 credits, Seminar. Instructor consent required. Prerequisite: PSYC 382.*

**PSYC 379. Leadership in the Workplace**

Theoretical and research issues associated with leadership in the workplace. Classical and current theories of leadership, research in leadership development, and evaluation of various leadership models. *3 credits, Seminar. Instructor consent required. Prerequisite: PSYC 382.*

**PSYC 380. Person Perception**

An examination of the social psychological literature dealing with person perception and cognition, organized around the historical development and current status of attribution theory and research. *3 credits, Seminar. Instructor consent required.*

**PSYC 381. Consumer Psychology**

Recent developments in consumer psychology including research on segmentation, positioning, packaging and advertising, with an emphasis on qualitative research methods and techniques. *3 credits, Lecture. Instructor consent required. Prerequisite: PSYC 337 or PSYC 382.*

**PSYC 382. Organizational Psychology**

Major research lines in organizational behavior (work motivation, leadership, work attitudes, job design, turnover, absenteeism), with attention to emerging areas (e.g., women in management). Emphasis on research methods and analytic strategies. *3 credits, Seminar. Open to doctoral students in Industrial/Organizational Psychology, others with permission.*

**PSYC 383. Sentence and Discourse Processing**

How psychological theories of perception and learning provide insight into language process-

ing at the level of sentence structure and discourse structure.

*3 credits, Lecture.*

**PSYC 384. Human Behavior Genetics**

Concepts and methods in human behavioral genetic analyses with emphasis on normal variations, psychopathologies, and ethical issues. *3 credits, Lecture.*

**PSYC 385. Neurobiology of Aging: Changes in Cognitive Processes**

Neural basis of age-related changes in learning and memory. Both the normal aging process and age-related pathologies examined. Encompasses both animal models and human data. *3 credits, Lecture. Instructor consent required.*

**PSYC 386. Social Cognition**

Study of causal attribution, stereotyping, evaluating, judgement and decision-making, persuasion, expectancies, memory, attention as they pertain to social life. *3 credits, Lecture.*

**PSYC 387. Personnel Psychology**

Techniques of personnel psychology: recruitment, selection, placement, evaluation, training, development, and related areas. *3 credits, Lecture. Open to doctoral students in Industrial/Organizational Psychology, others with permission.*

**PSYC 388. Human Factors**

Theories of design and analysis of man-machine systems in an industrial/organizational context. Special emphasis on the human as an information-processing sub-system operating with other people and machines in complex systems. Application of psychological principles to design of industrial workplaces, military systems, and consumer products; and to the design of simulation systems for training. *3 credits, Seminar. Open to doctoral students in Industrial/Organizational Psychology, others with permission.*

**PSYC 389. Social Organizational Psychology**

Organizational consulting using social psychological theories which employ the individual, group, and organization as units of analysis in organizational change. *3 credits, Lecture. Instructor consent required.*

**PSYC 390. Human Judgment and Decision Process**

Examination of social judgment methodology, judgmental heuristics and biases, process tracing, bootstrapping, behavioral decision theory, and multi-attribute utility measurement. *3 credits, Lecture. Open to doctoral students in Industrial/Organizational Psychology, others with permission.*

**PSYC 391. History of Psychology**

Intellectual antecedents to contemporary clinical, developmental, experimental, and social psychology. *3 credits, Lecture. Open to Psychology graduate students, others with permission.*

**PSYC 392. Measurement and Scaling**

History and theories of psychological measurement and scaling. Application of unidimensional scaling models (e.g., Thurstone, Guttman, and Likert scaling, hierarchical cluster analysis, multidimensional scaling, and factor analysis) to psychological research problems. *3 credits, Lecture. Instructor consent required. Prerequisite: STAT 379.*

**PSYC 393. Occupational Health and Safety**

Research methods, theories and findings related to the impact of work duties and environmental conditions on occupational safety and health. *3 credits, Lecture. Instructor consent required. Prerequisite: PSYC 388.*

**PSYC 394. Selection and Placement**

Theory and research on employee selection and placement. Selection models, employee testing, statistical methods in selection and placement, equal opportunity and EEOC guidelines and related ethical issues. *3 credits, Seminar. Instructor consent required. Prerequisite: PSYC 387.*

**PSYC 395. Performance Appraisal**

Methods and issues in performance rating in organizations. Classic studies and current models of performance evaluation are used to explore factors which enhance or hinder the accurate gathering, evaluation, and communication of employee performance information. *3 credits, Seminar. Prerequisite: PSYC 387.*

**PSYC 396. Design and Analysis of Human-Machine Systems**

The basis, in theories of perception and learning, for design of complex human-machine systems. *3 credits, Seminar. Instructor consent required. Prerequisite: PSYC 388.*

**PSYC 397. Simulation and Training**

The theoretical basis for techniques of effective training of human operators in complex human-machine systems. *3 credits, Seminar. Prerequisite: PSYC 388.*

†GRAD 395. Master's Thesis Research  
*1 - 9 credits.*

†GRAD 396. Full-Time Master's Research  
*3 credits.*

†GRAD 397. Full-Time Directed Studies (Master's Level)  
*3 credits.*

**GRAD 398. Special Readings (Master's)**  
*Non-credit.*

**GRAD 399. Thesis Preparation**  
*Non-credit.*

**PSYC 400. Work Systems and Performance**  
Research methods, theories and findings related to the impact of work duties, schedules, psychosocial variables and circadian psychophysiology on human performance.  
*3 credits, Seminar. Instructor consent required.*  
*Prerequisite: PSYC 388.*

**PSYC 405. Teaching Experimental Psychology**  
The lecture method applied to teaching undergraduate courses in experimental psychology (introductory, cognition, learning and memory, sensation and perception) and giving conference presentations. Attention is given to presentation style and content.  
*3 credits, Practicum.*

**PSYC 495. Internship in Clinical Psychology**  
Students assume professional psychological assessment, psychotherapeutic, and consultation responsibilities under the direct supervision of licensed clinical psychologists.  
*0 credits, Practicum. Instructor consent required.*

†**GRAD 495. Doctoral Dissertation Research**  
*1 - 9 credits.*

†**GRAD 496. Full-Time Doctoral Research**  
*3 credits.*

†**GRAD 497. Full-Time Directed Studies (Doctoral Level)**  
*3 credits.*

**GRAD 498. Special Readings (Doctoral)**  
*Non-credit.*

**GRAD 499. Dissertation Preparation**  
*Non-credit.*

## PUBLIC ADMINISTRATION

*Program Director:* Professor William Simonsen

*Professor:* Lewis

*Assistant Professors:* Bifulco, Donahue, Hettinger, Robbins

The Master of Public Administration (M.P.A.) program provides students with a dynamic and integrated approach to the study of public policy and management. The M.P.A. Program is committed to preparing students for leadership positions in public policy and management through a personalized education that is both theoretically rich and skills-based. The M.P.A. program is accredited by the National Association of Schools of Public Administration and Public Affairs (NASPAA). The M.P.A. website can be accessed at this address: <<http://www.mpa.uconn.edu>>.

**Admission.** Admission to the M.P.A. program is selective. Considerations for admission include: A bachelor's degree from an accredited college or University, a strong academic record as indicated by grade point average, acceptable verbal, quantitative and analytical scores from the Graduate Record Examinations (GRE). Acceptable TOEFL exam scores for international students are required. A personal letter, current resume and three letters of recommendations are also required.

The Admissions Committee begins the review of applications on **February 15th** for Fall admission and on **November 15th** for Spring admission.

All admissions materials can be found at this website: <http://www.mpa.uconn.edu>.

**The M.P.A. Degree.** The student's plan of study is individually developed in consultation with a major advisor to meet his or her goals and interests.

A focused approach is the program's framework for teaching public management, analytical techniques, and public policy. The curriculum is organized into a set of core courses, a field internship, and area of concentration, and a capstone project.

Problem-oriented courses prepare students for decision-making in public management. The program develops the skills managers need to diagnose problems, collect and analyze information, plan, choose among policy alternatives, communicate findings, implement programs, and manage change.

**Special Facilities.** The M.P.A. program is located in the Institute of Public Affairs (I.P.A.). Together with the M.P.A. Program, the Institute is home to the Master of Arts degree program in the field of Survey Research as well as two research centers: the Center for Policy Analysis and Management and the Center for Survey Research and Analysis. This unique arrangement allows interested students to combine the practical techniques of survey research with public policy and management. Students have the opportunity to take advantage of this synergy by enrolling in classes in survey research and participating in projects developed by the research centers.

## PUBLIC HEALTH

*Interim Field of Study Director:* Professor Glenn Affleck

*Professors:* Babor, Bruder, Handwerker, Reisine, Sheehan, and Tennen

*Associate Professors:* Beazoglou, Blechner, Cherniak, Erickson, Fifield, Fortinsky, Gregorio, Grey, Lewis, Pendry, Perez-Escamilla, Petry, Schensul, Stevens, Storey, and Walsh

*Assistant Professors:* Burlinson, Clive, Guha, Kerins, Lazzarini, Morse, Segal, Trapé-Cardoso, Ungemack, and Wetstone

The Public Health program, based in the Department of Community Medicine and Health Care, leads to the Master of Public Health degree. The program faculty represents the population-based health sciences located in a number of campuses, schools, and departments. The core curriculum consists of the basic public health disciplines: social and behavioral sciences, epidemiology, biostatistics, health administration, environmental health and health law. Electives allow emphasis in health administration, health research, and other areas. The program is tailored to the needs of working health professionals who wish to pursue part-time evening studies. Students must earn a minimum of 48 credits, both under Plan A (thesis project) and Plan B (master's essay). The credit requirement for the degree may be reduced based on the student's academic and professional background in community health. The program is accredited by the National Council on Education for Public Health.

**Dual Degree Programs.** The Graduate Program in Public Health sponsors dual degree programs with the Schools of Medicine (M.P.H./M.D.), Dental Medicine (M.P.H./D.M.D.), Social Work (M.P.H./M.S.W.), Nursing (M.P.H./M.S.), Law (M.P.H./J.D.). Information is available from: Holger Hansen, M.D., Dr.P.H., University of Connecticut Health Center, Farmington, Connecticut 06030-1910.

### COURSES OF STUDY

**PUBH 400. Introduction to Public Health**  
Provides an introduction to the discipline, its scientific foundations, and its relationship to other fields including clinical medicine. The basic concepts and skills necessary for a practitioner of public health are explained. Students gain a better appreciation of epidemiology to guide public health interventions and the development of public health policy.  
*3 credits, Lecture.*

**PUBH 401. Principles of Epidemiology**  
Introduction to epidemiological concepts and methods as applied to public health research, community diagnosis, prevention, health

planning and evaluation studies. Intensive use of exercises in descriptive and analytic epidemiology based on current investigations.  
*3 credits, Lecture.*

**PUBH 402. Introduction to Biostatistics**

An introductory presentation of the fundamentals of biostatistical theory and application, aimed at developing competence in the use of statistics, probability distributions, hypothesis testing, inference and estimation as applied to the most commonly used techniques in parametric and nonparametric statistical methods. Critical appraisal of research reported in journal articles serves as an application of learned techniques.  
*3 credits, Lecture.*

**PUBH 403. Health Administration**

Examination of past, present, and proposed approaches to the organization and management of health care services. Emphasis is on the role and functioning of the manager and the evolution of health care policy and trends as they affect managerial roles.  
*3 credits, Lecture.*

**PUBH 404. Environmental Health**

Explores the policy, political and public health implications of such issues as air pollution, drinking water, exposure to hazardous chemicals, indoor air pollution, food protection, lead poisoning, housing, international issues, etc. Provides the student with some basic technical information and familiarity with terms for a better understanding of policy and political decisions and health effects of environmental exposures.  
*3 credits, Lecture.*

**PUBH 405. Social and Behavioral Foundations of Public Health**

An introductory survey emphasizing basic social science concepts in the analysis of public health including orientations toward health, disease and health care, the origins and distribution of health care resources, and the role of social movements and research in improving public health.  
*3 credits, Lecture.*

**PUBH 406. Law and Public Health**

An introduction to the American legal system as it relates to health care and public health. Sessions present important applications of law to health including the powers of state governments, public health at the federal level, hospital, physician and HMO liability, emergency care and medical research, mental health law, reproductive health and the right to privacy, the right to refuse treatment and end of life issues, privacy and confidentiality in health care, infectious disease law and disability discrimination, and public health policy and advocacy.  
*3 credits, Lecture.*

**PUBH 407. Practicum in Public Health**

Under faculty guidance, students undertake an

organized set of activities that responds to an identified need of a public health agency or health-related organization. The activities may involve the policy development, planning, implementation, administration or evaluation of public health services, or a combination of such activities. Students should be appropriately advanced before initiating the practicum.  
*1 – 3 credits, Practicum.*

**PUBH 410. Fundamentals of Strategic Planning**

Fundamentals of strategic planning for public and non-profit organizations emphasizing the development of mission and vision statements, stakeholder analysis, scanning of internal and external environments; formulation and implementation of goals and objectives, definition of strategic issues, program planning, and evaluation. Introduction to related concepts in long range planning and group decision making. A group strategic planning project caps the course.  
*3 credits, Lecture.*

**PUBH 411. Managed Care**

Evolution of managed medical systems. New funding arrangements including episode based billing, capitation and negotiated payment. Management tools such as precertification, appropriateness protocols and concurrent review. Health services research and outcome studies.  
*3 credits, Lecture.*

**PUBH 412. Health Regulation**

Focus is on the relationship between law and health care. Regulation of practice, practitioners and facilities. Legal aspects of alternative delivery systems including managed care. Legal and ethical dimensions of the health care provider-client relationship also are addressed.  
*3 credits, Lecture.*

**PUBH 413. Law, Health Care, and Public Policy**

Role of law in the regulation of the health care process and in the development of public policy in health care. In addition to examining regulation of health care personnel, facilities, expenditures and planning, a series of contemporary public policy issues in health care are addressed.  
*1 – 3 credits, Lecture.*

**PUBH 414. Health Economics**

An introduction to economic theory and various applications of economics in the analysis of the U.S. health care system.  
*3 credits, Lecture.*

**PUBH 415. Accounting and Financial Analysis for Health Care Managers**

Course introduces the basic accounting and financial analysis methods necessary for the effective analysis, interpretation, and application of administrative information in health care institutions.  
*3 credits, Lecture.*

**PUBH 416. Quality Assurance in Health Care**

An introduction to the concepts, methods and uses of quality assurance in health care. Specific emphasis on quality assurance as it applies to continuous improvement, managed care, practice guidelines, preventive health, outcome studies and ethical issues.  
*3 credits, Lecture.*

**PUBH 417. Health Care Management Information Systems**

Overview of theoretical foundation, structure and operation of MIS in health services. MIS based indicators such as DRG's, severity of illness measures, relative value scales and workload measures. Uses of MIS data including utilization review, quality assurance and health services research.  
*3 credits, Lecture.*

**PUBH 418. Social Contexts of Health Organizations**

An in-depth analysis of the interaction between organizations and their sociological environments. An emphasis is placed on health service organizational obstacles to health planning.  
*3 credits, Lecture.*

**PUBH 419. Public Health Agencies**

Takes organization and management theory into practice. The focus is on governmental and non-profit agency management and administration. Emphasis is on developing and defending budgets, personnel management, working within the political context, with the community and with multiple agencies.  
*3 credits, Lecture.*

**PUBH 420. Voluntary Health Agencies**

A seminar designed to present fundamental principles and practical approaches, based upon both management and leadership models as well as organizational analysis processes, to manage effectively a not-for-profit voluntary agency.  
*3 credits, Seminar.*

**PUBH 430. Public Health Informatics**

An overview of the basic information skills required to clarify a health-related information need and identify and use appropriate information resources to select materials that answer that need. The course will include discussions of health-related networks and information resources, demonstrations of their appropriate use, class exercises and a semester project.  
*3 credits, Lecture. Enrollment limited to 12.*

**PUBH 431. Public Health Research Methods**

Introduction to conceptualization, methods, and analysis in public health research including: formulation of research questions and hypotheses, development of research and analytic models, use of qualitative (interviewing and observation) and quantitative (secondary and survey data) data collection methods, and qualitative and quantitative data analysis leading



to the formulation of research projects.  
*3 credits, Lecture.*

**PUBH 432. Health Services Research**

An advanced seminar designed to give students an opportunity to present and discuss their work in this area. Students need to have a completed, or nearly completed, research project before the start of the class in early July. Students interested in the seminar should discuss their proposed project with the instructor as early as possible.  
*3 credits, Lecture.*

**PUBH 433. Health Program Evaluation**

Methods of evaluating the implementation and impact of health programs. Topics include: specification of program objectives and components, experimental and quasi-experimental evaluation designs, collection and analysis of program data, and the dissemination and application of evaluation results.  
*3 credits, Lecture.*

**PUBH 434. Topics in Intermediate Biostatistics**

An introduction to the interplay of experimental design and data analysis. Begins with a review of statistical estimation and testing. Topics include analysis of variance, linear regression, and power analysis. Applications are emphasized through the demonstration and use of statistical software.  
*3 credits, Lecture.*

**PUBH 435. Statistical Methods in Epidemiology**

An introduction to the statistical methods most commonly used in analyzing data from epidemiological studies. The course begins with a review of basic epidemiology and statistics. Subsequently, the focus is on contingency table methods and logistic regression with emphasis on dose-response relationships, interaction and confounding. Computer software for data analysis is demonstrated.  
*3 credits, Lecture.*

**PUBH 437. Epidemiological Research Appraisal**

A research seminar on uses, strengths and limitations of epidemiological methodology. Major studies in infectious disease, chronic disease and health care epidemiology are critically analyzed. The goal is to promote sound judgment of the scientific validity of epidemiological evidence.  
*3 credits, Lecture.*

**PUBH 438. Investigation of Disease Outbreaks**

Provides students with the basic skills and perspectives necessary to investigate acute disease outbreaks. The emphasis is on the use of epidemiology to investigate outbreaks of infectious diseases, guide public health interventions, and develop public health policy. Students will participate in an outbreak investigation conducted by the state health department.  
*3 credits, Lecture.*

**PUBH 450. Public Health Practice**

Discussion of initiatives to define the practice of public health, including the Institute of Medicine (IOM) Report on the Future of Public Health and the Public Health Service's "essential functions" of public health. Includes review of expenditures studies and estimates of actual public health infrastructure resource needs, as well as discussion of appropriate future roles for public health.  
*3 credits, Lecture.*

**PUBH 451. Maternal and Child Health Services**

Maternal and child health services are examined, highlighting the past successes and future challenges to the health care delivery system. Current topics which include nutritional influences, reproductive technology, injury control, domestic violence, child abuse/neglect, emerging infections, perinatal risk behaviors and mental health provide case studies for evaluation of maternal and child health policy development.  
*3 credits, Lecture.*

**PUBH 452. Injury and Violence Prevention**

Injury and violence are major preventable public health problems with predictable patterns. The purpose of this course is to familiarize the student with the epidemiological literature of intentional and unintentional injuries. The course is designed to focus on the knowledge and skills required to design, implement, and evaluate scientifically sound community injury prevention and control programs.  
*3 credits, Lecture.*

**PUBH 453. Chronic Disease Control**

Chronic diseases are examined from clinical, epidemiological and program planning perspectives. Diseases examined include: selected neoplastic diseases, cardiovascular diseases, chronic obstructive pulmonary diseases, cerebrovascular disease and diabetes. The role of public health agencies, for profit and non-profit entities in research, education, and risk reduction activities also are covered.  
*3 credits, Lecture.*

**PUBH 454. Infectious Disease Control**

Overview of microbiology. Agent-host environment relationship in causation and control of infectious diseases. Epidemiological patterns of major infectious diseases, with emphasis on sexually transmitted diseases, respiratory conditions and nonsocomial infections.  
*3 credits, Lecture.*

**PUBH 455. Health Education**

Methods for planning, presenting, and evaluating health education programs in communities, schools and worksites. Includes use of the Precede Model, setting of goals and objectives, behavior modification theory, group processes, teaching techniques and activities for developing and presenting workshops or courses.  
*3 credits, Lecture.*

**PUBH 456. Community Nutrition**

Dietary goals, use and abuse of nutrients. Community nutrition services: identifying target populations, defining problems, program planning, evaluation of impact.  
*3 credits, Lecture.*

**PUBH 460. History of Public Health**

Development and fundamental historical themes of public health, from ancient civilizations to the present, with emphasis on public health history of the United States and its relevance to current public health issues. The development of local, state and national public health agencies in the U.S. is highlighted. The history of specific disease entities (e.g., TB) are discussed to illustrate major themes.  
*3 credits, Lecture.*

**PUBH 461. Healthcare Law and Ethics**

An analysis and evaluation of the legal rights of patients and providers in the health care process. Specific topics may include: nature of rights, consent to treatment, contraception, abortion, sterilization, involuntary commitment, and allocation of limited medical resources.  
*3 credits, Lecture.*

**PUBH 462. International Health**

Examines primary health care as a model suited to the health needs of developing nations. Provides a broader understanding of the genesis of illness in developing countries and analyzes the kind of care required to have an impact on these illnesses.  
*3 credits, Lecture.*

**PUBH 463. Comparative Health Systems**

An analysis of national health systems in relation to their socio-economic, political, cultural, and epidemiologic contexts. The examination of alternative approaches to organizing scarce health care resources serves as an integrating theme.  
*3 credits, Lecture.*

**PUBH 465. Occupational Health**

Recognition and prevention of occupational disease and injuries, including social and political aspects and policy issues such as OSHA and Workers' Compensation laws. Overview of some of the major occupational disease issues. Approaches of industrial hygiene, ergonomics, and occupational epidemiology to understanding and preventing occupational health hazards.  
*3 credits, Lecture.*

**PUBH 466. Industrial Hygiene**

The skills required to recognize, evaluate and control occupational hazards. Review of hazards associated with a variety of work processes and jobs. Students learn how to take an occupational history, to research the hazards associated with an industry, and to conduct a plant walk-through.

Control methods, such as ventilation and personal protective equipment, are evaluated.  
*3 credits, Lecture.*

**PUBH 467. Occupational and Environmental Disease**

Clinical introduction to occupational disease, including diagnostic strategies and patient management techniques. Review of the diseases of primary target organs, including the range of syndromes from that organ, appropriate diagnostic techniques, and treatment options.  
*3 credits, Lecture.*

**PUBH 468. Occupational and Environmental Epidemiology**

Topics include the history of occupational epidemiology, causal models, occupational exposure classification systems, environmental epidemiology, cohort mortality studies, cross-sectional surveys, case-control studies, ecologic studies, and statistical and methodological issues in research design and their solutions.  
*3 credits, Lecture.*

**PUBH 470. Health Behavior and Public Health**

The course covers the behavioral origins of disease/disability in populations, prevailing theories of health behavior, health promotion initiatives, evaluation of the efficacy of health promotion programs, interventions for changing at-risk behavior of targeted groups.  
*3 credits, Lecture.*

**PUBH 471. AIDS Seminar**

Examines the worldwide epidemic of HIV disease. Includes sections on epidemiology, natural history of HIV disease, retrovirus biology, comparisons with other epidemics past and present, treatment and testing, legal and public policy issues, education, behavior modification and other control efforts, and the public health response to the epidemic.  
*3 credits, Lecture. Instructor consent required.*

**PUBH 472. Disability and Public Health**

Examines both developmental and acquired disabilities from a public health perspective. Public health issues of cognitive and physical disability, including: prevention, diagnostic and definitional considerations, epidemiological and statistical controversies, legal and ethical aspects, treatment considerations and research concerns.  
*3 credits, Lecture.*

**PUBH 473. Women, Public Health and Reproduction**

The history of reproduction and public health issues in the U.S.; underlying ethical issues in modern reproductive health care and key components of opposing views; major financial, social and emotional considerations in policy making and the increasing role that reproductive health plays in public health as a whole.  
*3 credits, Lecture.*

**PUBH 474. Urban Health**

Comprehensive overview of historical forces and social factors related to the health status of African-Americans, Hispanics, and other minority groups in American society. Although much of the course content examines current minority health issues, the use of theory and research to identify underlying causes and to suggest practical strategies/interventions for addressing these problems is a major focus.  
*3 credits, Lecture.*

**PUBH 475. Gerontological Health**

Biological and social aspects of aging as they relate to the physical and mental health of older populations; the organization of geriatric health services; and the legal, ethical, and public policy issues posed by increases in life expectancy.  
*3 credits, Lecture.*

**PUBH 476. Community Mental Health**

Overview of mental illness, substance abuse and related conditions, including epidemiological patterns and interventions. Chronic mental patients, the homeless mentally ill and other special groups. The community mental health movement and role of government. Regulations and mental health law.  
*3 credits, Lecture.*

**PUBH 495. Independent Study in Public Health**

An individual course for those wishing to pursue special topics in the public health sciences under faculty supervision.  
*1 - 9 credits, Independent Study.*

**PUBH 497. Graduate Seminar in Public Health**

*1 - 6 credits, Seminar.*

†**GRAD 395. Master's Thesis Research**

*1 - 9 credits.*

†**GRAD 396. Full-Time Master's Research**

*3 credits.*

†**GRAD 397. Full-Time Directed Studies (Master's Level)**

*3 credits.*

**GRAD 398. Special Readings (Master's)**

*Non-credit.*

**GRAD 399. Thesis Preparation**

*Non-credit.*

## SOCIAL WORK

*Dean:* Professor Kay W. Davidson

*Associate Dean for Academic Affairs:* Assistant Professor Catherine M. Havens

*Associate Dean for Administration:* Associate Professor David Cournoyer

*Professors:* Alissi, Bloom, Borrero, Fisher, Gitterman, Healy, Hesselbrock, Hirayama, Humphreys, Johnson, Morales, Newman, and Pine

*Associate Professors:* Cournoyer, Dicks, Drachman, Heller, Klein, Kurz, Parks, Simmons, and Wayne

*Assistant Professors:* Comer, Codero, Negroni-Rodriguez

The University of Connecticut School of Social Work promotes social and economic justice by providing high quality graduate education in social work. The School shares with other units of the University the pursuit of excellence in teaching, research and scholarship, the vision of an expanded international role, and a commitment to public service that bring the knowledge of the University to the people of the State. The School of Social Work offers courses of study leading to the degrees of Master of Social Work and Doctor of Philosophy.

**The M.S.W. Program.** The primary goal of the M.S.W. program is to prepare competent professional practitioners to help people to enrich their lives, improve their communities, and contribute to social justice. To prepare MSW graduates for advanced practice in a variety of settings, the curriculum emphasizes knowledge and method skills for social work in micro-level practice (i.e. helping individuals, families, and groups to mobilize their personal and environmental resources to reach their goals) and macro-level practice (i.e. administration, policy formulations, organizational and environmental changes through group and community advocacy and social actions).

The course of study requires that students earn 18 of the program's 60 credits in field education, through supervised placements in agencies where they learn to integrate theory and practice. All students are required to complete courses in Micro and Macro Foundation, Human Behavior in the Social Environment; Micro (B 361) and Macro (B 360), Analysis of Social Welfare Policy (B 350), Human Oppression (B 300) and Advanced Research. In addition to the required foundation courses, students specialize in one of the following advanced major methods: casework, group work, community organization, administration or policy and planning. Electives and independent study enable students to meet their interests in substantive areas of the profession. The M.S.W. program at the University of Connecticut School of Social Work is accredited by the Council on Social Work Education.

**The M.S.W. Admission Procedure.** Applications for admission to the M.S.W. program should be sent directly to the School of Social Work. A more detailed description of the M.S.W. program, admission procedures, and financial aid information are available at the School of Social Work website <<http://www.ssw.uconn.edu>> and in the current view book of the School of Social Work which can be

## SOCIOLOGY

obtained from the Admissions Office, University of Connecticut School of Social Work, 1798 Asylum Avenue, West Hartford, Connecticut 06117. Phone: (860) 570-9118.

**Dual Degree Programs.** Reflecting the School's commitment to interdisciplinary teaching and practice, dual degree programs are offered with the University of Connecticut Schools of Law (J.D.), Business (M.B.A.) and Medicine (M.P.H.). A joint degree program is also offered with the Yale Divinity School. There are separate admission applications for these programs.

**The STEP Program.** The School of Social Work also has a non-degree program, STEP (Staff Training and Education for the Profession), that is available to students who hold a bachelor's degree. Students are encouraged to test their interest in the social work degree by taking courses in STEP. Students who then matriculate may be able to apply credits earned through STEP toward the MSW degree. Non-credit courses also are held on a variety of specialized social work topics.

**The Ph.D. Program.** The goal of the doctoral program in Social Work is to equip future social work leaders with the expert scholarly and research skills needed to provide intellectual leadership and direction to the profession. The program provides a rigorous curriculum designed to prepare social workers for careers as faculty in colleges and universities and as researchers, policy analysts and planners, and high level administrators in public and private social service organizations. The curriculum reflects the particular attention given to the unique role of research in the traditions of professional social work in relation to applied practice and to knowledge building.

The course of study consists of 54 graduate credits. Nine core courses (27 credits) provide the students with competency in advanced research methods and statistics, social science theories and practice theories, while the balance consists of three elective courses (9 credits) in related disciplines, dissertation preparation seminar (3 credits) and dissertation research (15 credits). It is expected that program completion will require three to five years for full-time students.

**The Ph.D. Admission Procedure.** In addition to the admission standards of the University of Connecticut Graduate School, applicants to the Ph.D. Program in Social Work must have an MSW degree and a minimum of two years post-MSW experience in social work. Completed applications, processing fee, residence affidavit, three letters of recommendation, a personal statement, financial aid form and curriculum vita, and official transcripts from all colleges/universities attended must be sent directly to the University of Connecticut School of Work Ph.D. Admissions Office. All Ph.D. Program applicants are advised to visit the UConn School of Social Work website <<http://www.ssw.uconn.edu>> for more detailed information about the Ph.D. Program.

*Department Head:* Professor Michael Wallace  
*Professors:* Abrahamson, Broadhead, Dashefsky, Glasberg, Gugler, Logan, Sanders, Taylor, Tec, Tuchman, and Villemez  
*Associate Professors:* Cazenave, DeFronzo, Hadden, Neubeck, and Weakliem  
*Assistant Professors:* Bernstein, Macdonald, McNeal, Oates, Purkayastha, and Ratcliff

The Department of Sociology offers study leading to the M.A. and Ph.D. degrees in sociology. Available study areas include deviance, gender, medical sociology, social structure and personality, political sociology, stratification and inequality, racism/ethnic group relations, and theory. The Department participates in the University's Corrections Program and the master's-level concentration in Survey Research. Members of the Department also are associated with Judaic Studies, African Studies, African-American Studies, Asian American Studies, and with Women's Studies.

The Department regards a basic understanding of research methods and statistics to be an essential part of graduate training in sociology. The knowledge and competence required correspond with three courses: 321, 322, and one statistical methods course. All students are required to pass these courses, or their equivalents, during their first two years of full-time study.

Candidates for the Ph.D. degree are required to have a master's degree in sociology or its equivalent as determined by the admissions committee. Applicants with master's degrees in other fields must be admitted to the master's program until they have satisfied the equivalency requirement.

It is recommended that master's students take courses in social structure and personality and social organization. Courses in social theory, methods, and statistics are required for the M.A. degree. Students may (1) write a Master's thesis or (2) submit a portfolio of their scholarly work in the four areas noted above (i.e., social structure and personality, social theory, social organization, and methods). Portfolios may be submitted at any time.

Students who have been admitted to the Ph.D. program by the departmental admissions committee are eligible to take the General Examination for the Ph.D. degree after fulfilling residence and course requirements, including the foreign language requirements (or six to nine credits in a related area). The General Examination consists of two area examinations in areas chosen by the student with the advice and consent of the advisory committee. Each area examination assesses substantive and theoretical knowledge of the area, understanding of the implications of this knowledge for general sociology, and methodological skills appropriate to the area.

## COURSES OF STUDY

### SOCI 300. Independent Study for Graduate Students

Special topic readings or investigations.  
*1 – 6 credits, Independent Study. Instructor consent required.*

### SOCI 301. Proseminar

*1 credit, Lecture. Instructor consent required.*

### SOCI 303. Teaching Sociology

A survey and discussion of the content, viewpoints and methods that can be employed in teaching sociology. Emphasis is on course preparation for new teachers.  
*1 – 3 credits, Seminar. Open only to graduate students in Sociology.*

### SOCI 305. Investigation of Special Topics

A seminar course. Topics vary by semester.  
*1 – 3 credits, Seminar. Instructor consent required.*

### SOCI 307. History of Sociological Theory

A historical analysis of the development of sociological theory. This course focuses upon the enduring questions that sociological theory has addressed, and the relations of sociological theory to prevailing social and intellectual conditions. An emphasis is placed upon 19th and early 20th century theorists, such as: Comte, Spencer, Sumner, Pareto, Simmel and others.  
*3 credits, Lecture. Instructor consent required.*

### SOCI 308. Core Theorists

An examination of the original writings of the major figures in sociological theory: Durkheim, Marx, Weber, and Simmel. The course focuses upon the theories of these major figures, their relations with contemporaries, their interconnections, and their influence upon subsequent theory and theory groupings.  
*3 credits, Seminar. Instructor consent required.*

### SOCI 309. Current Theory and Research

An examination of current theories. Topics include: consideration of their continuities with classical theories, conceptual and measurement problems in testing and constructing current theories, and the interplay between theory and research.  
*3 credits, Seminar. Instructor consent required. Prerequisite: SOCI 308.*

### SOCI 314. Human Ecology

A review of ecological theories and their application to the study of the human community.  
*3 credits, Lecture. Instructor consent required. Also offered as ARE 314.*

### SOCI 315. The Community

A critical analysis of current theories of the nature of the community, its types, functions, processes, agencies, and values. Emphasis is



given to community surveys and community organization.

*3 credits, Lecture. Instructor consent required.*

**SOCI 320. Seminar in Quantitative Methods in Sociology**

Introduction to quantitative techniques in sociology and computer data analysis. A prior undergraduate course in social statistics is recommended.

*3 credits, Seminar.*

**SOCI 321. Social Research I**

The logic of social scientific inquiry, the issues of reliability and validity in research design, and specific methods of data collection.

*3 credits, Seminar.*

**SOCI 322. Social Research II**

Fundamental techniques of applied data analysis and statistical computing. Emphasis on applications of statistical methods and their interpretation.

*3 credits, Seminar.*

**SOCI 323. Applied Survey Design and Analysis**

The design, administration, and analysis of sample surveys.

*3 credits, Lecture. Instructor consent required.*

*Prerequisite: SOCI 322.*

**SOCI 324. Qualitative Methodology**

Methods of conducting field research, with focus on techniques of negotiating entry into natural settings, participant observation, interviewing, and coding and analysis of qualitative data.

*3 credits, Seminar. Open to master's and doctoral students in Sociology, others with permission.*

**SOCI 334. Racism**

Variable topics in the study of racism, such as racism and U.S. social policy, white racism, and the social construction of whiteness. Topic may vary by semester.

*3 credits, Seminar. Instructor consent required.*

**SOCI 337. Seminar on Society and the Individual**

A comparative analysis of the major theoretical approaches to individual-society relations, with an emphasis upon interdisciplinary contributions and trends of development. Contemporary issues and the prospects for theoretical integration are examined in the perspective of the long-term development of the field.

*3 credits, Seminar. Instructor consent required.*

**SOCI 340. Seminar on Crime and Justice**

Broad survey of topics and issues relating to crime and the criminal justice system in the United States. Emphasis on policy issues.

*3 credits, Seminar. Instructor consent required.*

**SOCI 342. Majority-Minority Group Relations**

Current theories of majority-minority group relations with special reference to prejudice;

methodological issues, case studies and surveys.

*3 credits, Lecture. Instructor consent required.*

**SOCI 343. Seminar on American Jewry**

Applications of sociological theory and methods to the analysis of American Jewry.

*3 credits, Seminar.*

**SOCI 344. Sociology of Mental Illness**

Socio-cultural processes in relation to mental illness. Critique of sociological thinking regarding etiology, forms and treatment of mental illness.

*3 credits, Lecture. Instructor consent required.*

**SOCI 345. Deviant Behavior**

Review of theory and research, with emphasis on their implications for a general theory of deviant behavior.

*3 credits, Lecture. Instructor consent required.*

**SOCI 347. Social Gerontology**

A basic consideration of the societal aspects of aging including the social psychological concomitants of adjustments, changing roles, and systems of social relationships.

*3 credits, Lecture. Instructor consent required.*

**SOCI 349. Medical Sociology**

An examination of the institutional pattern of health care, including the social aspects of health and sickness, types of practitioners, and the social organization of therapeutic settings.

*3 credits, Lecture. Instructor consent required.*

**SOCI 351. Demography**

Survey and analysis of theories and present problem areas in demography. This includes such topics as: population growth and distribution, population composition, mortality, fertility, migration, and population policy.

*3 credits, Seminar. Instructor consent required.*

*Also offered as ARE 351.*

**SOCI 353. Methods of Population Analysis**

The sources and characteristics of demographic data and vital statistics and the methods and problems of population data analysis.

*3 credits, Seminar. Instructor consent required.*

*Also offered as ARE 353.*

**SOCI 354. Seminar in the Family**

An analytical study of the family as a social group in terms of structure, member roles, and function with an examination of ethnic, religious, and class differences. The interrelationship between the family and its cultural context is analyzed with particular reference to the impact of modern culture.

*3 credits, Seminar. Instructor consent required.*

**SOCI 356. Gender and Society**

Critical appraisal of social scientific perspectives on women and men. Feminist theory and current social science research on gender. Emphasis on interdisciplinary approaches.

*3 credits, Seminar.*

**SOCI 357. Seminar in Human Fertility, Mortality, and Migration**

A review and critique of the literature on fertility, mortality and migration, and the dynamic interaction of these variables in population change.

*3 credits, Seminar. Instructor consent required.*

*Also offered as ARE 357.*

**SOCI 359. Energy, Environment, and Society**

Sociological perspectives on energy production, distribution and consumption; environmental impacts and constraints; alternative energy and environment futures; and cross-national studies of policy formation and implementation.

*3 credits, Seminar.*

**SOCI 360. Analysis of Social Organization**

An examination of patterns of social organization found in bureaucracies and voluntary associations.

*3 credits, Seminar. Instructor consent required.*

**SOCI 363. Seminar in Social Control of Deviant Behavior**

*3 credits, Seminar. Instructor consent required.*

**SOCI 364. Political Sociology**

Sociological aspects of political institutions and behavior; social and economic bases of political power, ideology, and mobilization of support; community and national power systems, political parties, and elites.

*3 credits, Seminar. Instructor consent required.*

**SOCI 365. Social Change**

A study of the forces prompting and impeding societal change with particular attention to those operative in contemporary society. Major theories of social change are examined.

*3 credits, Lecture. Instructor consent required.*

**SOCI 366. Seminar in Social Stratification**

Social class theories, and problems of distribution of power and privileges. Some attention will be given to a comparative analysis of class systems.

*3 credits, Seminar. Instructor consent required.*

**SOCI 367. Seminar in Theories of the State**

A sociological examination of theoretical analysis of the role of the state in modern society, and the relationship between the state and the applications of these theories to empirical analyses of specific research questions.

*3 credits, Lecture.*

**SOCI 368. The Metropolitan Community**

Topics in urban sociology.

*3 credits, Lecture. Instructor consent required.*

**SOCI 369. Seminar in Comparative Urbanization**

Urbanization as a factor in social and cultural change, particularly in developed areas: Asia, Africa and Latin America.

*3 credits, Seminar. Instructor consent required.*

**SOCI 370. Inequality and the Welfare State**

Analysis of the relationship between systems of racial, class, and gender inequality, and the formation and implementation of social policy by the contemporary U.S. welfare state.  
3 credits, Seminar. Instructor consent required.

**SOCI 372. Law and Society**

An overview of theoretical perspectives in the sociology of law, with emphasis on classical social theory.  
3 credits, Lecture. Instructor consent required.

**SOCI 374. Comparative Analysis of Power Structures**

Analysis of power structures, with special references to the ways in which they are transformed.  
3 credits, Lecture. Instructor consent required.

**SOCI 375. Sociology of Work**

Analysis of work behavior with particular attention to formal and informal organization of labor, white collar, executive and professional roles.  
3 credits, Seminar. Instructor consent required.

**SOCI 380. Sociological Perspectives on Socio-Economic Development**

A critical review of differing analyses of developing countries as they concern social structure, processes of change, and blockages in development.  
3 credits, Seminar. Instructor consent required.

**SOCI 382. Health Organizations and Their Environments**

An in-depth analysis of the interaction between organizations and their sociological environments. An emphasis is placed on health service organizational obstacles to health planning.  
3 credits, Lecture.

**SOCI 383. Cross-National Study of Health Systems**

An analysis of national health systems in relation to their socio-economic, political, cultural, and epidemiologic contexts. The examination of alternative approaches to organizing scarce health care resources serves as an integrating theme for the course.  
3 credits, Lecture.

**SOCI 390. Social Movements**

Analysis of the conditions and processes underlying movement formation and participation and influencing their careers and outcomes.  
3 credits, Seminar. Instructor consent required.

†GRAD 395. Master's Thesis Research  
1 - 9 credits.

†GRAD 396. Full-Time Master's Research  
3 credits.

†GRAD 397. Full-Time Directed Studies (Master's Level)  
3 credits.

GRAD 398. Special Readings (Master's)  
Non-credit.

GRAD 399. Thesis Preparation  
Non-credit.

†GRAD 495. Doctoral Dissertation Research  
1 - 9 credits.

†GRAD 496. Full-Time Doctoral Research  
3 credits.

†GRAD 497. Full-Time Directed Studies (Doctoral Level)  
3 credits.

GRAD 498. Special Readings (Doctoral)  
Non-credit.

GRAD 499. Dissertation Preparation  
Non-credit.

## STATISTICS

Department Head: Professor Dipak Dey  
Professors: Glaz, Kuo, Mukhopadhyay, and Vitale  
Associate Professor: Chen, Ravishanker, and Wang

The Department of Statistics offers work leading to the M.S. and Ph.D. degrees, as well as courses in applied statistics in support of graduate programs in other fields. The M.S. program combines training in both statistical application and theory. To broaden their view of the use of statistics, candidates for the master's degree are required to enroll in at least one course involving the application of statistics offered by any other department on campus except Computer Science and Mathematics. In addition, students are encouraged to become involved in the statistical consultation work done by members of the Department. The doctoral program also provides a balance between statistical methods and theory. It emphasizes the development of the ability to create new results in statistical methods, statistical theory, or probability. After completing the necessary course work and a sequence of comprehensive written and oral examinations, the Ph.D. student must write a dissertation representing an original contribution to the field of statistics or probability. It is possible for the dissertation to be predominantly a development of statistical methodology in new areas of application. Both the M.S. and Ph.D. programs allow students sufficient flexibility to pursue their interests and to provide the time to take courses offered by other departments.

There are no official course requirements for admission to graduate study in the Department, but a degree of mathematical facility is necessary for acceptable progress through the program.

The Department of Statistics is housed in the Mathematical Sciences Building, which also contains the Department of Mathematics and the University Computer Center. Extensive computational facilities are available. The Homer Babbidge Library provides excellent coverage of current and past issues of statistics journals as well as books in this field.

### COURSES OF STUDY

**STAT 300. Investigation of Special Topics**  
1 - 6 credits, Independent Study. Instructor consent required.

**STAT 301. Introduction to Applied Statistics**  
One-, two- and k-sample problems, regression, elementary factorial and repeated measures designs, covariance. Use of computer packages, e.g., SAS and MINITAB.  
3 credits, Lecture. Not open to students who have passed STAT 201 or STAT 201Q.

**STAT 310. Distribution Theory for Statistics**  
3 credits, Lecture. Open to graduate students in Statistics, others with permission.

**STAT 311. Supervised Research in Statistics**  
1–6 credits, Practicum.

**STAT 314. Advanced Statistical Methods**

Discrete and continuous random variables, exponential family, joint and conditional distributions, order statistics, statistical inference: point estimation, confidence interval estimation, and hypothesis testing.  
3 credits, Lecture. Instructor consent required.

**STAT 315. Mathematical Statistics I**

Introduction to probability theory, transformations and expectations, moment generating function, discrete and continuous distributions, joint and marginal distributions of random vectors, conditional distributions and independence, sums of random variables, order statistics, convergence of a sequence of random variables, the central limit theorem.  
3 credits, Lecture.

**STAT 316. Mathematical Statistics II**

The sufficiency principle, the likelihood principle, the invariance principle, point estimation, methods of evaluating point estimators, hypotheses testing, methods of evaluating tests, interval estimation, methods of evaluating interval estimators.  
3 credits, Lecture. Prerequisite: STAT 315.

**STAT 320. Applied Statistics I**

Exploratory data analysis: stem-and leaf plots, Box-plots, symmetry plots, quantile plots, transformations, discrete and continuous distributions, goodness of fit tests, parametric and non-parametric inference for one sample and two sample problems, robust estimation, Monte Carlo inference, bootstrapping.  
3 credits, Lecture. Open to graduate students in Statistics, others with permission.

**STAT 321. Applied Statistics II**

Analysis of variance, regression and correlation, analysis of covariance, general linear models, robust regression procedures, and regression diagnostics.  
3 credits, Lecture Prerequisite: STAT 320.

**STAT 330. Statistical Inference I**

Exponential families, sufficient statistics, loss function, decision rules, convexity, prior information, unbiasedness, Bayesian analysis, minimaxity, admissibility, simultaneous and shrinkage estimation, invariance, equivariant estimation.  
3 credits, Lecture. Open to graduate students in Statistics, others with permission.

**STAT 331. Statistical Inference II**

Statistics and subfields, conditional expectations and probability distributions, uniformly most powerful tests, uniformly most powerful unbiased tests, confidence sets, conditional inference, robustness, change point problems,

order restricted inference, asymptotics of likelihood ratio tests.

3 credits, Lecture. Open to graduate students in Statistics, others with permission. Prerequisite: STAT 330.

**STAT 332. Linear Statistical Models**

Linear and matrix algebra concepts, generalized inverses of matrices, multivariate normal distribution, distributions of quadratic forms in normal random vectors, least squares estimation for full rank and less than full rank linear models, estimation under linear restrictions, testing linear hypotheses.  
3 credits, Lecture. Open to graduate students in Statistics, others with permission.

**STAT 333. Advanced Probability**

Fundamentals of measure and integration theory: fields,  $\sigma$ -fields, and measures; extension of measures; Lebesgue-Stieltjes measures and distribution functions; measurable functions and integration theorems; the Radon-Nikodym Theorem, product measures, and Fubini's Theorem. Introduction to measure-theoretic probability: probability spaces and random variables; expectation and moments; independence, conditioning, the Borel-Cantelli Lemmas, and other topics as time allows.  
3 credits, Lecture. Open to graduate students in Statistics, others with permission.

**STAT 342. Analysis of Experiments**

Straight-line regression, multiple regression, regression diagnostics, transformations, dummy variables, one-way and two-way analysis of variance, analysis of covariance, stepwise regression.  
3 credits, Lecture. Prerequisite: STAT 301. Not open to students who have passed STAT 242 or STAT 242Q.

**STAT 343. Design of Experiments**

One way analysis of variance, multiple comparison of means, randomized block designs, Latin and Graeco-Latin square designs, factorial designs, two-level factorial and fractional factorial designs, nested and hierarchical designs, split-plot designs.  
3 credits, Lecture. Prerequisite: STAT 301. Not open to students who have passed STAT 243 or STAT 243Q.

**STAT 352. Sampling Theory**

Sampling and nonsampling error, bias, sampling design, simple random sampling, sampling with unequal probabilities, stratified sampling, optimum allocation, proportional allocation, ratio estimators, regression estimators, super population approaches, inference in finite populations.  
3 credits, Lecture. Open to graduate students in Statistics, others with permission.

**STAT 356. Introduction to Operations Research**  
3 credits, Lecture. Open to graduate students in Statistics, others with permission.

**STAT 361. Statistical Computing**

Use of computing for statistical problems; obtaining features of distributions, fitting models and implementing inference. Basic numerical methods, nonlinear statistical methods, numerical integration, modern simulation methods.  
3 credits, Lecture. Open to graduate students in Statistics, others with permission.

**STAT 372. Introduction to Biostatistics**

Rates and proportions, sensitivity, specificity, two-way tables, odds ratios, relative risk, ordered and non-ordered classifications, reads, case-control studies, elements of regression including logistic and Poisson, additivity and interaction, combination of studies and meta-analysis.  
3 credits, Lecture. Instructor consent required.

**STAT 373. Clinical Trials**

Basic concepts of clinical trial analysis; controls, randomization, blinding, surrogate endpoints, sample size calculations, sequential monitoring, side-effect evaluation and intention-to-treat analyses. Also, experimental designs including dose response study, multicenter trials, clinical trials for drug development, stratification, and cross-over trials.  
3 credits, Lecture. Instructor consent required.

**STAT 374. Concepts and Analysis of Survival Data**

Survival models, censoring and truncation, nonparametric estimation of survival functions, comparison of treatment groups, mathematical and graphical methods for assessing goodness of fit, parametric and nonparametric regression models.  
3 credits, Lecture.

**STAT 379. Quantitative Methods in the Behavioral Sciences**

A course designed to acquaint the student with the application of statistical methods in the behavioral sciences. Correlational methods include multiple regression and related multivariate techniques.  
3 credits, Lecture.

**STAT 380. Applied Time Series**

Introduction to prediction using time-series regression methods with non-seasonal and seasonal data. Smoothing methods for forecasting. Modeling and forecasting using univariate autoregressive moving average models.  
3 credits, Lecture. Open to graduate students in Statistics, others with permission.



**STAT 382. Applied Multivariate Analysis**  
Multivariate normal distributions, inference about a mean vector, comparison of several multivariate means, principal components, factor analysis, canonical correlation analysis, discrimination and classification, cluster analysis.  
*3 credits, Lecture. Open to graduate students in Statistics, others with permission.*

†**GRAD 395. Master's Thesis Research**  
*1 - 9 credits.*

†**GRAD 396. Full-Time Master's Research**  
*3 credits.*

†**GRAD 397. Full-Time Directed Studies (Master's Level)**  
*3 credits.*

**GRAD 398. Special Readings (Master's)**  
*Non-credit.*

**GRAD 399. Thesis Preparation**  
*Non-credit.*

**STAT 410. Seminar in Applied Statistics**  
*1 - 6 credits, Seminar. Open to graduate students in Statistics, others with permission.*

**STAT 420. Seminar in Nonparametric Statistics**  
*1 - 6 credits, Lecture. Open to graduate students in Statistics, others with permission.*

**STAT 430. Seminar in Multivariate Statistics**  
*1 - 6 credits, Lecture. Open to graduate students in Statistics, others with permission.*

**STAT 440. Seminar in the Theory of Statistical Inference**  
*1 - 6 credits, Lecture. Open to graduate students in Statistics, others with permission.*

**STAT 450. Seminar in the Theory of Probability and Stochastic Processes**  
*1 - 6 credits, Lecture. Open to graduate students in Statistics, others with permission.*

**STAT 460. Seminar in Biostatistics**  
*1 - 6 credits, Lecture. Open to graduate students in Statistics, others with permission.*

**STAT 470. Seminar in Applied Probability**  
*1 - 6 credits, Lecture. Open to graduate students in Statistics, others with permission.*

†**GRAD 495. Doctoral Dissertation Research**  
*1 - 9 credits.*

†**GRAD 496. Full-Time Doctoral Research**  
*3 credits.*

†**GRAD 497. Full-Time Directed Studies (Doctoral Level)**  
*3 credits.*

**GRAD 498. Special Readings (Doctoral)**  
*Non-credit.*

**GRAD 499. Dissertation Preparation**  
*Non-credit.*

## WOMEN'S STUDIES

*Program Director:* Dr. Marita McComiskey  
*Core Faculty:* S.P. Benson, M. Breen, A. D'Alleva, F. Dussart, V. Makowsky, D. Meyers, and N. Naples

In virtually every field of university study, scholarship on women and gender has become increasingly influential because of its path-breaking theoretical perspectives and its empirical findings. The programs of virtually every professional association testify to the vitality and presence of feminist research.

The Women's Studies Graduate Certificate at the University of Connecticut can be earned by students enrolled in a graduate degree program, or as a stand-alone certificate for those who have completed their undergraduate degree.

Although feminist scholarship may be available in other disciplines, Women's Studies offers a concentrated perspective and in-depth analysis. The graduate certificate enables students to pursue interdisciplinary study in this flourishing field while enhancing their educational background by encouraging the integration of personal, academic and political experiences and ideals.

Because the program is interdisciplinary and students will approach the certificate from a range of home fields and with widely varying preparation, all certificate plans of study will be individualized. Each certificate candidate combines the study of Women's Studies theory and methodology, either through current study or prior preparation. The core faculty of the Women's Studies Program will act as advisors to certificate students; careful advising will ensure that each student's program has the appropriate interdisciplinary breadth and fits appropriately with her/his other course work and professional needs.

All Women's Studies certificate plans of study must include work in more than one department and must be approved by the Program Director or her designee, who will coordinate the certificate program.

The requirements for the Graduate Certificate in Women's Studies follow:

1. For non-degree students:

Open to students with a bachelor's degree upon approval of the Women's Studies Graduate Study Committee.

Requires 12 hours of course work, of which at least nine hours must be at the 300 level or above, including:

Philosophy 352 - Feminist Theory  
Women's Studies 365 - Women's Studies Research Methodology

Not more than one Women's Studies 390 may be applied to the certificate.

2. For students enrolled in existing graduate programs:

Open to students enrolled in any UConn graduate program.

Requires 12 hours of course work, of which at least nine hours must be at the 300 level or above.

Not more than one Women's Studies 390 may be applied to the certificate.

Application forms for both options may be obtained from the Women's Studies Program office.

Courses applicable to the Graduate Certificate in Women's Studies include many advanced 200's-level Women's Studies courses and the following graduate-level Women's Studies courses as well as a variety of courses in Anthropology, English, French, History, Human Development and Family Studies, Philosophy, Political Science, Psychology, and Sociology. Each semester the Women's Studies Program publishes a list of the applicable courses to be offered in the following semester.

## COURSES OF STUDY

### **WS 301. Women and American Education**

An interdisciplinary analysis of gender and the issue of sex equity in American educational institutions from the Colonial to the contemporary period.

*3 credits, Seminar.*

### **WS 315. Gender and Culture**

Anthropological perspectives on the analysis of gender with special focus on dynamics of gender, culture, and power.

*3 credits, Lecture.*

### **WS 333. Topics in the History of American Women**

*3 credits, Lecture. Instructor consent required.*

### **WS 341. Analysis of Rituals**

Examines various theoretical contributions to the anthropological study of ritual. Controversies and ambiguities surrounding the social and symbolic significance of the ritual act for both men's and women's experiences and participation are addressed.

*3 credits, Lecture. Prerequisite: Anthropology 311.*

### **WS 344. Psychology of Women and Gender**

A survey of research and theory on the interpretation of sex differences; gender, status, and power, and women's life span development.

*3 credits, Lecture. Instructor consent required.*

### **WS 365. Women's Studies Research Methodology for Graduate Students**

Discussion of feminist and gender-oriented research methods and their relation to traditional disciplines. Analysis of gender bias in research design and practice. Major independent research project required.

*3 credits, Lecture.*

### **WS 390. Independent Study for Graduate Students**

*1 – 6 credits, Independent Study. Instructor consent required.*

### **WS 395. Special Topics Seminar in Women's Studies**

Topics of current interest from a feminist perspective.

*3 credits, Seminar.*

# GRADUATE FACULTY

The Graduate Faculty includes only those individuals appointed by the dean of the Graduate School by authorization of the President. Members of the University Faculties who hold the rank of assistant professor or above at the University of Connecticut may become members of the Graduate Faculty upon recommendation of the department head (or dean of a school or college which is not departmentalized) and approval by the dean of the Graduate School if the professor's department, alone or in conjunction with another department, offers a program leading to a degree awarded through The Graduate School. A professor whose department does not offer a graduate degree program may be appointed to the Graduate Faculty by the dean of the Graduate School on the recommendation of the head of a department, (or dean of a school or college which is not departmentalized) whose graduate degree program(s) the professor would serve.

The following list is current as of May 2003.

- Jorgelina Abbate, *Assistant Professor of Education*, Ph.D., Boston College
- Nelly M. Abboud, *Associate Professor of Civil Engineering*, Ph.D., University of Delaware
- Kinetsu Abe, *Professor of Mathematics*, Ph.D., Brown University, D.Sc., Tohoku University, Japan
- William Abikoff, *Professor of Mathematics*, Ph.D., Polytechnic Institute of Brooklyn
- Mark Abrahamson, *Professor of Sociology*, Ph.D., Washington University
- Michael L. Accorsi, *Professor of Civil Engineering*, Ph.D., Northwestern University
- Luke E. K. Achenie, *Associate Professor of Chemical Engineering*, Ph.D., Carnegie-Mellon University
- K. James Ackley, *Assistant Professor of Music*, M.M., Cleveland Institute of Music
- Cynthia H. Adams, *Professor of Allied Health*, Ph.D., University of Connecticut
- Douglas J. Adams, *Assistant Professor of Orthopaedic Surgery*, Ph.D., University of Iowa
- Eldridge S. Adams, *Associate Professor of Ecology and Evolutionary Biology*, Ph.D., University of California, Berkeley
- Roger G. Adams, *Professor of Plant Science in Residence*, Ph.D., University of Massachusetts
- Adam J. Adler, *Assistant Professor of Medicine*, Ph.D., Columbia University
- Glenn G. Affleck, *Professor of Community Medicine and Health Care*, Ph.D., University of Connecticut
- John R. Agar, *Associate Professor of Prosthodontics*, D.D.S., Medical College of Virginia; M.A., George Washington University
- V. Bede Agocha, *Assistant Professor of Psychology*, Ph.D., University of Missouri
- H. Leonardo Aguila, *Assistant Professor of Medicine*, Ph.D., Albert Einstein College of Medicine
- Michael J. Ahearne, *Assistant Professor of Marketing*, Ph.D., Indiana University
- Francis W. Ahking, *Associate Professor of Economics*, Ph.D., Virginia Polytechnic Institute and State University
- Mark Aindow, *Associate Professor of Metallurgy and Materials Engineering*, Ph.D., University of Liverpool, England
- Arlene D. Albert, *Professor of Molecular and Cell Biology*, Ph.D., University of Virginia
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- Barry G. Sheckley, *Professor of Education*, Ph.D., University of Connecticut
- Nancy W. Sheehan, *Associate Professor of Family Studies*, Ph.D., University of Wisconsin
- T. Joseph Sheehan, *Professor, Department of Research in Health Education*, Ph.D., University of Chicago
- Dong-Guk Shin, *Professor of Computer Science and Engineering*, Ph.D., University of Michigan
- Jay Sanford Shivers, *Professor of Education*, Ph.D., University of Wisconsin
- Nancy Shoemaker, *Associate Professor of History*, Ph.D., University of Minnesota
- William J. Shoemaker, *Associate Professor of Psychiatry*, Ph.D., Massachusetts Institute of Technology
- Sandra E. Shumway, *Adjunct Professor of Marine Sciences in Residence*, Ph.D., D.Sc., University College of North Wales, United Kingdom
- Alexander A. Shvartsman, *Associate Professor of Computer Science and Engineering*, Ph.D., Brown University
- Stuart Jay Sidney, *Professor of Mathematics*, Ph.D., Harvard University
- Del L. Siegle, *Associate Professor of Education in Residence*, Ph.D., University of Connecticut
- John A. Silander, *Professor of Ecology and Evolutionary Biology*, Ph.D., Duke University
- Lawrence K. Silbart, *Associate Professor of Animal Science*, Ph.D., University of Michigan
- Blanca G. Silvestrini, *Professor of History*, Ph.D., State University of New York, Albany
- Evelyn M. Simien, *Assistant Professor of Political Science*, Ph.D., Purdue University
- Louise B. Simmons, *Associate Professor of Social Work*, Ph.D., Massachusetts Institute of Technology
- Christine M. Simon, *Professor of Ecology and Evolutionary Biology*, Ph.D., State University of New York, Stony Brook
- Richard H. Simon, *Professor of Surgery*, M.D., St. Louis University
- William Simonsen, *Professor of Political Science*, Ph.D., New York University
- Charles Singer, *Assistant Professor of Anthropology*, Ph.D., University of Utah
- Suman Singha, *Professor of Horticulture*, Ph.D., Cornell University
- Boris Sinkovic, *Associate Professor of Physics*, Ph.D., University of Hawaii
- C. F. Sirmans, *Professor of Finance*, Ph.D., University of Georgia
- Annelie C. Skoog, *Assistant Professor of Marine Sciences*, Ph.D., University of Göteborg, Sweden
- Laurie E. Sloan, *Associate Professor of Art*, M.F.A., Temple University
- Barth F. Smets, *Associate Professor of Civil Engineering*, Ph.D., University of Illinois
- Joseph W. Smey, *Professor of Allied Health*, Ed.D., Clark University
- Henry M. Smilowitz, *Professor of Pharmacology*, Ph.D., Massachusetts Institute of Technology
- Erling Smith, *Professor of Civil Engineering*, Ph.D., University of Durham, England
- Michael Smith, *Professor of Chemistry*, Ph.D., Purdue University
- Winthrop Ware Smith, *Professor of Physics*, Ph.D., Massachusetts Institute of Technology
- Leslie B. Snyder, *Associate Professor of Communication Sciences*, Ph.D., Stanford University
- William B. Snyder, *Associate Professor of Linguistics*, Ph.D., Massachusetts Institute of Technology
- David Arthur Sonstroem, *Professor of English*, Ph.D., Harvard University
- Richard H. Sosis, *Assistant Professor of Anthropology*, Ph.D., University of New Mexico
- Gregory A. Sotzing, *Assistant Professor of Materials Science*, Ph.D., University of Florida
- Larz S.W. Spangberg, *Professor of Endodontics*, Doct. Ondont., University of Umea, Sweden
- Karen Spalding, *Professor of History*, Ph.D., University of California, Berkeley
- Cheryl Spaulding, *Associate Professor of Education*, Ph.D., Stanford University
- Domina Eberle Spencer, *Professor of Mathematics*, Ph.D., Massachusetts Institute of Technology
- Kenneth Angelo Speranza, *Associate Professor of Pharmacy Administration*, Ph.D., Purdue University
- Eugene Spiegel, *Professor of Mathematics*, Ph.D., Massachusetts Institute of Technology
- Susan Spiggle, *Associate Professor of Marketing*, Ph.D., University of Connecticut
- Nikolaus A. Spoerel, *Assistant Professor of Biochemistry*, Ph.D., Free University, West Germany
- Ronald Squibbs, *Assistant Professor of Music*, Ph.D., Yale University
- Narasimhan Srinivasan, *Associate Professor of Marketing*, Ph.D., State University of New York, Buffalo
- Pramod K. Srivastava, *Professor of Medicine*, Ph.D., Osmania University, India
- Ranjan Srivastava, *Assistant Professor of Chemical Engineering*, Ph.D., University of Maryland
- Glenn Stanley, *Professor of Music*, Ph.D., Columbia University
- Brett A. Steinberg, *Assistant Professor of Psychology*, Ph.D., University of South Carolina
- Robert W. Stephens, *Professor of Music*, Ph.D., Indiana University
- Jennifer Sterling-Folker, *Associate Professor of Political Science*, Ph.D., University of Chicago
- David A. Stern, *Professor of Dramatic Arts*, Ph.D., Temple University
- Richard G. Stevens, *Associate Professor of Community Medicine and Health Care*, Ph.D., University of Washington
- John D. Stiver, *Assistant Professor of Economics*, Ph.D., University of Rochester
- Eileen Storey, *Associate Professor of Medicine*, M.D., M.P.H., Harvard University
- Gary P. Storhoff, *Associate Professor of English*, Ph.D., University of Connecticut
- Linda D. Strausbaugh, *Professor of Molecular and Cell Biology*, Ph.D., Wesleyan University



- Philip A. Streifer, *Associate Professor of Education*, Ph.D., University of Connecticut
- Zoe L. Strickler, *Assistant Professor of Art*, M.Des., University of Alberta, Canada
- Leslie D. Strong, *Assistant Professor of Family Studies in Residence*, Ph.D., Florida State University
- James D. Stuart, *Professor of Chemistry*, Ph.D., Lehigh University
- William C. Stwalley, *Professor of Physics*, Ph.D., Harvard University
- Steven Suib, *Professor of Chemistry*, Ph.D., University of Illinois
- Chong Sook Paik Sung, *Professor of Chemistry*, Ph.D., Polytechnic Institute of New York
- Charles M. Super, *Professor of Family Studies*, Ph.D., Harvard University
- Steven G. Sutton, *Professor of Accounting*, Ph.D., University of Missouri
- Harvey Alan Swadlow, *Professor of Psychology*, Ph.D., University of Miami
- Mark S. Swanson, *Professor of Physics*, Ph.D., University of Missouri
- Whitney Tabor, *Assistant Professor of Psychology*, Ph.D., Stanford University
- Theodore L. Taigen, *Associate Professor of Ecology and Evolutionary Biology*, Ph.D., Cornell University
- Jiong Tang, *Assistant Professor of Mechanical Engineering*, Ph.D., Pennsylvania State University
- Bette Talvacchia, *Professor of Art*, Ph.D., Stanford University
- John Tanaka, *Professor of Chemistry*, Ph.D., Iowa State University
- Jason M. Tanzer, *Professor of Oral Diagnosis*, D.M.D., Tufts University; Ph.D., Georgetown University
- Marvin L. Tanzer, *Professor of BioStructure and Function*, M.D., New York University
- Geoffrey W. Taylor, *Professor of Electrical Engineering*, Ph.D., University of Toronto, Canada
- Ronald L. Taylor, *Professor of Sociology*, Ph.D., Boston University
- Thomas D. Taylor, *Professor of Prosthodontics*, D.D.S., University of Iowa; M.S.D., University of Minnesota
- Nechama Tec, *Professor of Sociology*, Ph.D., Columbia University
- Howard Tennen, *Professor of Community Medicine and Health Care*, Ph.D., University of Massachusetts
- Alexander Teplayev, *Assistant Professor of Mathematics*, Ph.D., Cornell University
- Mark Terasaki, *Associate Professor of Physiology*, Ph.D., University of California, Berkeley
- Thomas Milton Terry, *Associate Professor of Molecular and Cell Biology*, Ph.D., Yale University
- Carolyn M. Teschke, *Associate Professor of Molecular and Cell Biology*, Ph.D., Washington State University
- Lakshman S. Thakur, *Associate Professor of Information Management*, Eng.Sc.D., Columbia University
- Edward A. Thibodeau, *Assistant Professor of Behavioral Sciences and Community Health*, Ph.D., University of Rochester
- Deborah J. Thomas, *Associate Professor of Nursing*, D.N.S., State University of New York, Buffalo
- Robert Mark Thorson, *Professor of Geology and Geophysics*, Ph.D., University of Washington
- Roger S. Thrall, *Professor of Medicine*, Ph.D., Marquette University
- X. Cindy Tian, *Assistant Professor of Animal Science*, Ph.D., Cornell University
- David Tiberio, *Associate Professor of Allied Health*, Ph.D., University of Connecticut
- Robert S. Tilton, *Associate Professor of English*, Ph.D., Stanford University
- Jeffrey Lynn Tollefson, *Professor of Mathematics*, Ph.D., Michigan State University
- Lang Tong, *Associate Professor of Electrical Engineering*, Ph.D., University of Notre Dame
- Thomas Torgersen, *Professor of Geology and Geophysics*, Ph.D., Columbia University
- Constantine Trahiotis, *Professor of Neuroscience*, Ph.D., Wayne State University
- Marcia C. Trapé-Cardoso, *Associate Professor of Clinical Medicine in Residence*, M.D., University of São Paulo, Brazil
- Roger M. Travis, Jr., *Associate Professor of Classics*, Ph.D., University of California, Berkeley
- Kimberli R. H. Treadwell, *Assistant Professor of Psychology*, Ph.D., Temple University
- John Gordon Troyer, *Associate Professor of Philosophy*, Ph.D., Harvard University
- Stephen L. Trumbo, *Associate Professor of Ecology and Evolutionary Biology*, Ph.D., University of North Carolina
- Clarence L. Trummel, *Professor of Periodontics*, D.D.S., University of Missouri; Ph.D., University of Rochester
- Eileen Trzcinski, *Assistant Professor of Economics*, Ph.D., University of Michigan
- Pei-Tsan Tsai, *Assistant Professor of Physiology and Neurobiology*, Ph.D., University of California, Berkeley
- Petros Tsiouras, *Professor of Pediatrics*, M.D., National University of Athens, Greece
- Gaye Tuchman, *Professor of Sociology*, Ph.D., Brandeis University
- Peter Turchin, *Professor of Ecology and Evolutionary Biology*, Ph.D., Duke University
- Hans Turley, *Associate Professor of English*, Ph.D., University of Washington
- Michael Thomas Turvey, *Professor of Psychology*, Ph.D., Ohio State University
- Jane A. Ungemack, *Assistant Professor of Community Medicine and Health Care*, Dr.PH., Columbia University
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- Kelly H. Usategui, *Assistant Professor of Marketing*, Ph.D., University of South Carolina
- Ernest B. Uthgennant, *Associate Professor of Civil Engineering*, Ph.D., University of Connecticut
- Marcel Utz, *Assistant Professor of Materials Science*, D.T.S., ETH Zürich, Switzerland
- Harry van der Hulst, *Professor of Linguistics*, Ph.D., Leiden University, The Netherlands
- Jaci L. VanHeest, *Assistant Professor of Education in Residence*, Ph.D., Michigan State University
- Herbert J. Van Kruiningen, *Professor of Pathobiology*, D.V.M., Ph.D., Cornell University; M.D., Brown University
- C. Arthur Van Lear, *Assistant Professor of Communication Sciences*, Ph.D., University of Utah
- John F. Veiga, *Professor of Management and Organization*, D.B.A., Kent State University
- Anthony T. Vella, *Assistant Professor of Medicine*, Ph.D., Cornell University
- Sandra G. Velleman, *Assistant Professor of Animal Science in Residence*, Ph.D., University of Connecticut
- Richard Vengroff, *Professor of Political Science*, Ph.D., Syracuse University
- Kumar S. Venkitanarayanan, *Assistant Professor of Animal Science*, Ph.D., University of Connecticut
- Roelf J. Versteeg, *Assistant Professor of Geology and Geophysics*, Ph.D., University of Paris, France
- Alexander C. Vias, *Assistant Professor of Geography*, Ph.D., University of Arizona
- Wayne J. Villemez, *Professor of Sociology*, Ph.D., University of Texas
- Robert T. Vinopal, *Associate Professor of Molecular and Cell Biology*, Ph.D., University of California, Davis
- Charles I. Vinsonhaler, *Professor of Mathematics*, Ph.D., University of Washington
- Pieter Visscher, *Associate Professor of Marine Sciences*, Ph.D., University of Groningen, The Netherlands
- Richard A. Vitale, *Professor of Statistics*, Ph.D., Brown University
- Jeff S. Volek, *Assistant Research Professor of Kinesiology*, Ph.D., Pennsylvania State University
- Katarina von Hammerstein, *Associate Professor of German*, Ph.D., University of California, Los Angeles
- Brian E. Waddell, *Associate Professor of Political Science*, Ph.D., City University of New York
- David L. Wagner, *Associate Professor of Ecology and Evolutionary Biology*, Ph.D., University of California, Berkeley
- David M. Waitzman, *Assistant Professor of Neurology*, M.D., Ph.D., City University of New York
- Randall S. Walikonis, *Assistant Professor of Physiology and Neurobiology*, Ph.D., Mayo Graduate School of the Mayo Clinic
- Michael Wallace, *Professor of Sociology*, Ph.D., Indiana University
- Altina L. Waller, *Professor of History*, Ph.D., University of Massachusetts
- Stephen Walsh, *Assistant Professor of Community Medicine and Health Care*, Sc.D., Harvard University
- Bing C. Wang, *Assistant Professor of Electrical and Computer Engineering*, Ph.D., Princeton University
- Guanhua Wang, *Associate Professor of History*, Ph.D., Michigan State University
- Guiling Wang, *Assistant Professor of Civil and Environmental Engineering*, Ph.D., Massachusetts Institute of Technology
- Tixiang Wang, *Associate Professor of Mathematics*, Ph.D., University of Connecticut
- Yazhen Wang, *Associate Professor of Statistics*, University of California, Berkeley
- Zhao-Wen Wang, *Assistant Professor of Neuroscience*, Ph.D., Michigan State University



J. Evan Ward, *Associate Professor of Marine Sciences*, Ph.D., University of Delaware

Glenn S. Warner, *Associate Professor of Natural Resources Management and Engineering*, Ph.D., University of Minnesota

Nicholas Warren, *Assistant Professor of Medicine*, Sc.D., University of Massachusetts, Lowell

Dudley T. Watkins, *Professor of Physiology*, M.D., Ph.D., Western Reserve University

James Watras, *Associate Professor of Physiology*, Ph.D., Washington State University

Janet S. K. Watson, *Assistant Professor of History*, Ph.D., Stanford University

Julianne Wayne, *Associate Professor of Social Work*, Ed.D., Clark University

David Weakliem, *Professor of Sociology*, Ph.D., University of Wisconsin

Shannon E. Weaver, *Assistant Professor of Family Studies*, Ph.D., University of Maryland

Mei Wei, *Assistant Professor of Metallurgy and Materials Engineering*, Ph.D., University of New South Wales, Australia

Friedmann J. Weidauer, *Associate Professor of Modern and Classical Languages*, Ph.D., University of Wisconsin

Mary G. Weinland, *Assistant Professor of Education in Residence*, Ph.D., University of Connecticut

Robert A. Weiss, *Professor of Chemical Engineering*, Ph.D., University of Massachusetts

Sandra Weller, *Professor of Microbiology*, Ph.D., University of Wisconsin

Barrett O. Wells, *Assistant Professor of Physics*, Ph.D., Stanford University

Kentwood D. Wells, *Professor of Ecology and Evolutionary Biology*, Ph.D., Cornell University

Raymond William Wengel, *Professor of Plant Science*, Ph.D., University of Wisconsin

Mark E. Westa, *Assistant Professor of Plant Science*, M.L.A., Harvard University

Scott L. Wetstone, *Assistant Professor of Community Medicine and Health Care*, M.D., University of Connecticut

Samuel Crane Wheeler, *Professor of Philosophy*, Ph.D., Princeton University

Bruce A. White, *Professor of Physiology*, Ph.D., University of California, Berkeley

Robert Bruce Whitlatch, *Professor of Marine Sciences*, Ph.D., University of Chicago

Stephen K. Wikel, *Professor of Physiology*, Ph.D., University of Saskatchewan, Canada

Roger B. Wilkenfeld, *Professor of English*, Ph.D., University of Rochester

Michael Willenborg, *Associate Professor of Accounting*, Ph.D., Pennsylvania State University

Peter K. Willett, *Professor of Electrical Engineering*, Ph.D., Princeton University

Michelle Williams, *Associate Professor of Psychology*, Ph.D., University of Georgia

Andrew Winokur, *Professor of Psychiatry*, M.D., Tufts University; Ph.D., University of Pennsylvania

Sarah E. Winter, *Associate Professor of English*, Ph.D., Yale University

Steven K. Wisensale, *Professor of Family Studies*, Ph.D., Brandeis University

Leslie Wolfson, *Professor of Neurology*, M.D., Albert Einstein College of Medicine

Charles W. Wolgemuth, *Assistant Professor of Physiology*, Ph.D., University of Arizona

Thomas K. Wood, *Professor of Chemical Engineering*, Ph.D., North Carolina State University

Bradley Wright, *Assistant Professor of Sociology*, Ph.D., University of Wisconsin

Carol A. Wu, *Assistant Professor of Medicine*, Ph.D., Vanderbilt University

Catherine H. Wu, *Professor of Medicine*, Ph.D., City University of New York

Dianqing Wu, *Associate Professor of Genetics and Developmental Biology*, Ph.D., Clarkson University

George Y. Wu, *Professor of Medicine*, M.D., Ph.D., Albert Einstein College of Medicine

David A. Yalof, *Associate Professor of Management*, Ph.D., Johns Hopkins University

Xiangzhong Yang, *Professor of Animal Science*, Ph.D., Cornell University

Xiusheng Yang, *Professor of Natural Resource Management and Engineering*, Ph.D., Ohio State University

Charles Yarish, *Professor of Ecology and Evolutionary Biology*, Ph.D., Rutgers University

Philip L. Yeagle, *Professor of Molecular and Cell Biology*, Ph.D., Duke University

Edvin Yegir, *Assistant Professor of Art*, M.F.A., Yale University

Susanne F. Yelin, *Assistant Professor of Physics*, Ph.D., Ludwig-Maximilians Universität, Germany

Andrew Yiannakis, *Professor of Education*, Ph.D., University of New Mexico

Michael Young, *Associate Professor of Education*, Ph.D., Vanderbilt University

Mark A. Youndt, *Assistant Professor of Management*, Ph.D., Pennsylvania State University

Richard A. Zeff, *Associate Professor of Pathology*, Ph.D., Rush University

Bi Zhang, *Associate Professor of Mechanical Engineering*, Ph.D., Tokyo Institute, Japan

Ping Zhang, *Associate Professor of Molecular and Cell Biology*, Ph.D., Albert Einstein College of Medicine

Lei Zhu, *Assistant Professor of Chemical Engineering*, Ph.D., University of Akron

Qiang Zhu, *Assistant Professor of Endodontology*, Ph.D., University of Connecticut

Qing Zhu, *Associate Professor of Electrical and Systems Engineering*, Ph.D., University of Pennsylvania

Christian M. Zimmermann, *Associate Professor of Economics*, Ph.D., Carnegie Mellon University

Steven A. Zinn, *Associate Professor of Animal Science*, Ph.D., Michigan State University

Cyrus Zirakzadeh, *Professor of Political Science*, Ph.D., University of California, Berkeley

Michael A. Zito, *Associate Professor of Allied Health*, M.S., Ohio State University

Mark G. Zurolo, *Assistant Professor of Art*, M.F.A., Yale University

## RESEARCH PROFESSORS AND RESEARCH SCIENTISTS

Research professors and research scientists are affiliated with the University's many supported research programs. While some are not members of the Graduate Faculty, they contribute significantly to ongoing research in many graduate Fields of Study.

This list is current as of May 2003.

Diane Biegel, *Assistant Research Professor*, Ph.D., New York University

Martin J. Blackburn, *Research Professor*, Ph.D., Cambridge University, England

Steven A. Boggs, *Research Professor*, Ph.D., University of Toronto, Canada

Patricia A. Bresnahan, *Assistant Research Professor*, Ph.D., University of Connecticut

Christopher A. Edwards, *Assistant Research Professor*, Ph.D., Massachusetts Institute of Technology

Wael Eldessouki, *Assistant Research Professor*, Ph.D., North Carolina State University

Linda K. Frisman, *Research Professor*, Ph.D., Brandeis University

Claire F. Michaels, *Research Professor*, Ph.D., University of Connecticut

Chandra S. Roychoudhuri, *Research Professor*, Ph.D., University of Rochester

Daniel R. Schwartz, *Research Scientist*, D.V.M., Tufts University

Jeff S. Volek, *Assistant Research Professor*, Ph.D., Pennsylvania State University

Xiangqun Xie, *Assistant Research Professor*, Ph.D., University of Connecticut

# ADJUNCT FACULTY IN THE GRADUATE SCHOOL

An appointment to adjunct faculty status in The Graduate School is honorary and recognizes an individual, who is not otherwise eligible for membership on the Graduate Faculty, possessing experience in a scholarly, scientific, or clinical field of research or practice. The following individuals have been appointed to such status by the dean of the Graduate School. Adjunct faculty members in The Graduate School may serve as Associate Advisors on graduate students' advisory committees. The Field of Study with which the individual is associated is indicated. An appointment ends on August 31 of the year noted.

The list is current as of June 2003.

- Michael Adamowicz, *Adjunct Assistant Professor on the Graduate School* (Molecular and Cell Biology), Ph.D., University of Nebraska (2003)
- David E. Amacher, *Adjunct Professor in the Graduate School* (Pharmaceutical Science), Ph.D., Kent State University (2003)
- Luigi Ambrosio, *Adjunct Professor in the Graduate School* (Polymer Science), *Dottore in Ingegneria Chimica*, University of Naples, Italy (2003)
- James B. Anderson, *Adjunct Professor in the Graduate School* (Molecular and Cell Biology), Ph.D., University of Connecticut (2004)
- Theodore G. Andreadis, *Adjunct Professor in the Graduate School* (Pathobiology and Veterinary Science), Ph.D., University of Florida (2003)
- Ali R. Banijamali, *Adjunct Associate Professor in the Graduate School* (Pharmaceutical Science), Ph.D., Massachusetts College of Pharmacy and Allied Health Sciences (2003)
- Michele R. Barber, *Adjunct Assistant Professor in the Graduate School* (Molecular and Cell Biology), Ph.D., University of Connecticut (2004)
- Barry Baxt, *Adjunct Assistant Professor in the Graduate School* (Pathobiology and Veterinary Science), Ph.D., State University of New York Downstate Medical Center (2005)
- Elizabeth K. Berner, *Adjunct Assistant Professor in the Graduate School* (Geological Sciences), A.M., Radcliffe College (2003)
- Jeffrey V. Bronke, *Adjunct Associate Professor in the Graduate School* (Biomedical Engineering), M.S., Hartford Graduate Center (2004)
- Fred Brown, *Adjunct Professor in the Graduate School* (Pathobiology and Veterinary Science), Ph.D., Manchester University (2006)
- Ernesto Callegari, *Adjunct Assistant Professor in the Graduate School* (Pharmaceutical Science), Ph.D., Brandeis University (2004)
- Rosa E. Carrasquillo, *Adjunct Assistant Professor in the Graduate School* (International Studies), Ph.D., University of Connecticut (2004)
- L. Lawrence Chapoy, *Adjunct Professor in the Graduate School* (Polymer Science), Ph.D., Princeton University (2003)
- Steven D. Cohen, *Adjunct Professor in the Graduate School* (Pharmaceutical Science), D.Sc., Harvard University (2003)
- Sydney P. Craig III, *Adjunct Professor in the Graduate School* (Molecular and Cell Biology), Ph.D., California Institute of Technology (2006)
- Michael D. Curtis, *Adjunct Associate Professor in the Graduate School* (Civil and Environmental Engineering), Ph.D., University of Connecticut (2003)
- Richard T. Darrington, *Adjunct Associate Professor in the Graduate School* (Pharmaceutical Science), Ph.D., University of Utah (2005)
- Nancy Drew, *Adjunct Associate Professor in the Graduate School* (Nursing), Ph.D., University of Illinois (2003)
- Leonard I. Eisenfeld, *Adjunct Associate Professor in the Graduate School* (Biomedical Engineering), M.D., Yale University (2004)
- Richard A. Freund, *Adjunct Professor in the Graduate School* (Judaic Studies), Ph.D., Jewish Theological Seminary of America (2003)
- Marc R. Gastonguay, *Adjunct Assistant Professor in the Graduate School* (Pharmaceutical Science), Ph.D., Georgetown University (2003)
- Jon R. Geiger, *Adjunct Assistant Professor in the Graduate School* (Molecular and Cell Biology), Ph.D., University of Connecticut (2003)
- William T. Golde, *Adjunct Assistant Professor in the Graduate School* (Pathobiology and Veterinary Science), Ph.D., University of Colorado (2005)
- Domenico Grasso, *Adjunct Professor in the Graduate School* (Civil and Environmental Engineering), Ph.D., University of Michigan (2005)
- Marvin J. Grubman, *Adjunct Assistant Professor in the Graduate School* (Pathobiology and Veterinary Science), Ph.D., University of Pittsburgh (2005)
- Charles C. Han, *Adjunct Professor in the Graduate School* (Polymer Science), Ph.D., University of Wisconsin (2004)
- J. Richard Jadamec, *Adjunct Assistant Professor in the Graduate School* (Geological Sciences), M.S., Lehigh University (2003)
- Samuel D. Kassow, *Adjunct Professor in the Graduate School* (Judaic Studies), Ph.D., Princeton University (2003)
- Berel Lang, *Adjunct Professor in the Graduate School* (Judaic Studies), Ph.D., Columbia University (2003)
- Thomas M. Laue, *Adjunct Professor in the Graduate School* (Molecular and Cell Biology), Ph.D., University of Connecticut (2005)
- Herbert V. Levinsky, *Adjunct Professor in the Graduate School* (Pharmaceutical Science), D.A.S., University of Agriculture, Austria (2003)
- Ralph S. Lewis, *Adjunct Assistant Professor in the Graduate School* (Geological Sciences), M.S., Franklin and Marshall College (2003)
- Dale W. Matheson, *Adjunct Professor in the Graduate School* (Pharmaceutical Science), Ph.D., University of Pennsylvania (2003)
- J. Gregory McHone, *Adjunct Professor in the Graduate School* (Geological Sciences), Ph.D., University of North Carolina (2004)
- Joseph H. McIsaac III, *Adjunct Associate Professor in the Graduate School* (Biomedical Engineering), M.D., University of Connecticut (2004)
- Daniel P. McNamara, *Adjunct Associate Professor in the Graduate School* (Pharmaceutical Science), Ph.D., University of Michigan (2003)
- Nikolaos P. Nikolaidis, *Adjunct Professor in the Graduate School* (Civil and Environmental Engineering), Ph.D., University of Iowa (2004)
- Nicholas T. Noyes, *Adjunct Assistant Professor in the Graduate School* (Biomedical Engineering), M.S., California State University, Sacramento (2004)
- Frank R. Painter, *Adjunct Assistant Professor in the Graduate School* (Biomedical Engineering), M.S., State University of New York, Buffalo (2004)
- George A. Perdrizet, *Adjunct Associate Professor in the Graduate School* (Molecular and Cell Biology), M.D., University of Connecticut; Ph.D., University of Chicago (2003)
- Martha D. Rekrut, *Adjunct Assistant Professor in the Graduate School* (Latin American Studies), Ph.D., University of Connecticut (2003)
- Luis L. Rodriguez, *Adjunct Assistant Professor in the Graduate School* (Pathobiology and Veterinary Science), Ph.D., University of Wisconsin (2005)
- Eric Rosow, *Adjunct Assistant Professor in the Graduate School* (Biomedical Engineering), M.S., Hartford Graduate Center (2004)
- Carol A. Scherzinger, *Adjunct Assistant Professor in the Graduate School* (Molecular and Cell Biology), Ph.D., University of Connecticut (2003)
- Peter J. Snyder, *Adjunct Professor in the Graduate School* (Psychology), Ph.D., Michigan State University (2004)
- Raymond E. Stoll, *Adjunct Professor in the Graduate School* (Pharmaceutical Science), Ph.D., Purdue University (2003)
- Bruce O. Stuart, *Adjunct Professor in the Graduate School* (Pharmaceutical Science), Ph.D., University of Rochester (2003)
- Inke Maria Sunila, *Adjunct Assistant Professor in the Graduate School* (Pathobiology and Veterinary Science), Ph.D., University of Helsinki, Finland (2003)
- Gregory J. Tsongalis, *Adjunct Associate Professor in the Graduate School* (Pathobiology and Veterinary Science), Ph.D., University of Medicine and Dentistry of New Jersey (2005)
- De-Ping Yang, *Adjunct Associate Professor in the Graduate School* (Pharmaceutical Sciences), Ph.D., University of Connecticut (2005)
- Mehran Yazdani, *Adjunct Assistant Professor in the Graduate School* (Pharmaceutical Science), Ph.D., University of Wisconsin (2004)
- Marek Zakrzewski, *Adjunct Associate Professor in the Graduate School* (Pharmaceutical Sciences), Ph.D., Dalhousie University (2005)



# EMERITUS FACULTY AND STAFF

List from the Department of Human Resources,  
University of Connecticut, April 2003

John L. Abbott, *Professor, English*  
 Arthur S. Abramson, *Professor, Linguistics*  
 Harold J. Abramson, *Professor, Sociology*  
 Walter C. Adelsperger, *Professor, Dramatic Arts*  
 Evelyn S. Ahlberg, *Assistant Professor, Mathematics*  
 William A. Aho, *Professor, Poultry Science*  
 Janet M. Aitken, *Professor, Geology and Geography*  
 Robert A. Aldrich, *Professor, Natural Resources  
Management and Engineering*  
 Max M. Allen, *Associate Professor, Psychology*  
 Derek W. Allinson, *Professor, Plant Science*  
 Robert L. Anderson, *Extension Agent,  
Cooperative Extension Service*  
 Henry N. Andrews, *Professor, Biology*  
 Ronald F. Aronson, *Professor,  
Cooperative Extension Service*  
 Glenn C. Atkyns, *Professor, Education*  
 Isabelle K. Atwood, *Assistant Vice President  
for Business Services*  
 Gerhard Austin, *Associate Professor,  
Modern and Classical Languages*  
 Alphonse Avitabile, *Director, Waterbury Campus*  
 Leonid V. Azaroff, *Professor, Materials Science*  
 Leon E. Bailey, *Associate Vice President, Academic  
Affairs*  
 James L. Baird, Jr., *Director, Avery Point Campus*  
 Robert C. Baldwin, *Interim Dean, Extended and Continuing  
Education*  
 Frank W. Ballard, *Professor, Dramatic Arts*  
 William G. Barber, Jr., *Extension Agent,  
Cooperative Extension Services*  
 Gene J. Barberet, *Professor,  
Modern and Classical Languages*  
 Robert L. Bard, *Professor, Law*  
 Elliot J. Barnard, *Associate Professor,  
Allied Health Professions*  
 Reuben M. Baron, *Professor, Psychology*  
 Peter S. Barth, *Professor, Economics*  
 Edward L. Bartholomew, *Professor, Metallurgy*  
 John Bartok, *Extension Professor*  
 Ralph H. Bartram, *Professor, Physics*  
 Floyd L. Bass, *Professor, Educational Leadership*  
 James M. Bauer, *Professor, Physical Therapy*  
 Curt F. Beck, *Professor, Political Science*  
 Robert L. Bee, *Professor, Anthropology*  
 James P. Bell, *Professor, Chemical Engineering*  
 Robert B. Bendel, *Professor, Animal Science*  
 Carroll O. Bennett, *Professor, Chemical Engineering*  
 Harold Berger, *Associate Professor, English*  
 Riva Berleant, *Professor, Anthropology*  
 Henrietta Bernal, *Professor, Nursing*  
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- Robert Schor, *Professor, Physics*
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- Peter R. Strutt, *Professor, Metallurgy*
- Archibald Stuart, *Professor, Social Work*
- Patricia Stuart, *Extension Professor, Institute of Public Service*
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- Donald W. Sundstrom, *Professor, Chemical Engineering*
- Vincent Suprynowicz, *Professor, Electrical and Systems Engineering*
- Richard Swibold, *Professor, Art*
- Colin C. Tait, *Professor, Law*
- Daniel W. Talmadge, *Associate Professor, Poultry Science*
- Barbara E. Teasdale, *Associate Professor, Allied Health Professions*
- Morton J. Tenzer, *Associate Professor, Political Science*
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- Thomas P. Weinland, *Professor, Curriculum and Instruction*
- Barbara L. Welsh, *Professor, Marine Sciences*
- Richard F. Wendel, *Professor, Marketing*
- R. William Wengel, *Professor, Plant Science*
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## APPENDIX

### ACADEMIC INTEGRITY IN GRADUATE EDUCATION AND RESEARCH

The assurance of integrity in graduate education and research is of paramount concern. Academic and scholarly activity at the graduate level takes many forms at the University of Connecticut, including, but not limited to, classroom activity, laboratory or field experience, and artistic expression. The Graduate School of the University of Connecticut upholds the highest ethical standards in its teaching, research, and service missions.

The Code of Conduct and the statement of Hearing and Appeal Procedures that follow pertain to matters involving graduate academic and scholarly misconduct. Responsibility for such misconduct requires intent but is not excused by ignorance. Thus, it is important for students to be conversant with the tenets of this Code. Matters of a disciplinary nature in which graduate students may become involved are to be addressed by Section III of the University's "Student Conduct Code," enforcement of which is within the purview of the Dean of Students.

The Dean of the Graduate School is charged with responsibility for coordinating the process by which an allegation of academic misconduct on the part of a graduate student is reported, investigated, and adjudicated. The Graduate Faculty Council, in accordance with the provisions of its By-Laws, is responsible for the formulation of policies and procedures pertaining to any and all matters of academic integrity in graduate education and research and to proper handling of allegations of violations. Members of the Graduate Faculty have primary responsibility to promote and to sustain throughout the University an environment in which the highest ethical standards of teaching, scholarship, research, and publication prevail. All members of the University community have a responsibility to uphold the highest standards of teaching, scholarship, research, and publication and to report any violation of academic integrity of which they have knowledge.

#### A. FORMS OF ACADEMIC AND SCHOLARLY MISCONDUCT

There are many forms of academic and scholarly misconduct. Categories of academic and scholarly misconduct are identified below, and where appropriate, illustrations are given. These categories and illustrations are not intended to be exhaustive.

**CHEATING** could occur during a course (e.g., on a final examination), on

an examination required for a particular degree (e.g., the doctoral General Examination, the Final Examination for the master's or the doctoral degree, or a foreign language translation test), or at other times during graduate study.

**PLAGIARISM** involves taking the thoughts, words, or ideas of others and passing them off as one's own.

**MISREPRESENTATION** could involve, for example, taking an examination for another student; submitting for evaluation work done by another individual; submitting the same work for evaluation in two or more courses without prior approval; unauthorized use of previously completed scholarly work or research for a thesis, dissertation, or publication; or making false, inaccurate, or misleading claims or statements when applying for admission to the Graduate School or in any scholarly or research activity, including publication.

**UNAUTHORIZED POSSESSION, USE, OR DESTRUCTION OF ACADEMIC OR RESEARCH MATERIALS**, which include, for example, examinations, library materials, laboratory or research supplies or equipment, research data, notebooks, or computer files.

**COMPUTER VIOLATIONS** include but may not be limited to unauthorized use, tampering, sabotage, or piracy of computer files or data and the like.

**FABRICATION OR FALSIFICATION IN RESEARCH** could involve, for example, deliberate falsification of experimental results or tampering in any way with actual experimental results or research data.

**RESEARCH VIOLATIONS** involving, for example, human subject violations (including ethical and social violations), animal care violations, inappropriate breaches of confidentiality, deliberate obstruction of the research progress of another individual, or deliberate disregard for applicable University, local, State, or federal regulations.

**CONFLICTS OF INTEREST** such as, for example, unauthorized use of University or faculty academic or research facilities, materials, or resources for unapproved purposes; or allowing or attempting to use personal relationships (academic or otherwise) between a graduate student and any member of the University community to influence improperly academic judgments, scholarly evaluations, or decision making.

**TAMPERING** with any document or computer file pertaining to academics

or research, including, for example, student academic records, official transcripts, laboratory journals, examination papers, and the like.

**ANY ATTEMPT TO INFLUENCE IMPROPERLY**, for example, by means of bribery or threat, any member of the faculty, the staff, or the administration of the University in any matter pertaining to academics or research.

**AIDING OR ABETTING** another individual in the planning or the commission of any act of academic misconduct.

**ANY IMPROPRIETY OR ACT OF MISCONDUCT COMMITTED BY A GRADUATE STUDENT IN A TEACHING ROLE** in the University, such as requesting or accepting a favor in exchange for a grade or engaging in any form of sexual harassment.

**DELIBERATE OBSTRUCTION** of an investigation of any act of academic or research misconduct.

#### B. ACADEMIC MISCONDUCT WITHIN A PARTICULAR COURSE

When an instructor believes there is sufficient evidence to demonstrate a clear case of academic misconduct within a particular course taught by that instructor, the instructor shall notify the student in writing, and also orally if possible, that unless the student requests a hearing to contest the instructor's belief, the instructor shall impose the appropriate academic consequences warranted by the circumstances. This should occur within 30 days of discovery of the alleged academic misconduct. The appropriate academic consequence for serious offenses is generally considered to be failure in the course. For less serious offenses regarding small portions of the course work, failure for that portion is suggested, with the requirement that the student repeat the work satisfactorily for no credit.

The faculty member is responsible for saving the evidence of academic misconduct in its original form and need not return any of the papers or other materials to the student. Copies of the student's work and information about other evidence will be provided to the student upon request.

The student is given seven days from this first written notice to respond. If the student confesses or does not respond to the written notice of the instructor's belief of academic misconduct and appropriate consequences within the course, the academic consequences shall be imposed and a report submitted to the Dean of the instructor's school or college and to the Dean of the Graduate School.

If a student chooses to contest the instructor's belief of academic misconduct, the student must make a written request to the Office of the Dean of the Graduate School for a hearing to determine the facts of the alleged misconduct.

### C. ALLEGATIONS OF ACADEMIC MISCONDUCT

The following procedures apply in most instances where academic misconduct is alleged. In some cases, misconduct may be alleged for students who are supported through a federally funded fellowship or training grant program or through other federal grants (e.g., as a Research Assistant). In such instances, the procedures stipulated by agreements between the University and the federal government will prevail, including use of the University's policy and procedures for review of alleged unethical research practices. The procedures described in this document will apply to those allegations not subsumed by such agreements. In addition, standards governing the professional conduct of students in particular fields may be relevant in certain settings (e.g., clinical, counseling, therapeutic, etc.). Allegations of professional misconduct based on such standards may be brought forward under this code.

Whenever an alleged violation of this code has been filed with the Office of the Dean of the Graduate School, the accused is to be notified in writing within ten working days. The written statement filed with the Office of the Dean should describe fully the alleged misconduct and the circumstances involved (i.e., the name of the individual alleged to be responsible for the misconduct; date, time, place of the alleged misconduct; name(s) of person(s) who might have been involved in or have knowledge of the alleged misconduct; and any other pertinent information). The statement must bear the signature(s) of the individual(s) submitting it, and it must be dated. A copy of the statement will be sent to the accused within ten working days of its filing. The Dean of the Graduate School will discuss the allegation of academic misconduct with the dean of the relevant school or college. The Dean of the Graduate School will then make a determination regarding whether the alleged violation should be resolved at the Graduate School level in accordance with the hearing and appeal procedures contained herein or whether the alleged violation should be referred to the field of study, academic department, school or college in which the infraction is thought to have occurred. (Such a determination will also be made when an accused student, pursuant to section B, requests a hearing.)

If the alleged violation is referred to the field of study, academic department, school or college, then it will be addressed and resolved in accordance with the applicable hearing and appeal procedures followed by that particular unit. The Office of the Dean of the Graduate School will notify the accused in writing of this determination. In the event that the alleged violation is referred to the field of study, academic department, school or college, the Office of the Dean of the Graduate School should be notified of any outcome of the case. In either event, the Dean of the school or college in which the alleged misconduct occurred is notified that a report of alleged misconduct has been received.

If the alleged violation is to be resolved at the Graduate School level, the report of alleged misconduct is referred to the Office of the Dean of the Graduate School, which confirms the allegation(s) and the existence of supporting evidence. The Office reviews the allegation(s) and the evidence to determine specifically which provision(s) of this Code is/are alleged to have been violated. If the allegation(s) cannot be supported, or if there is insufficient evidence to proceed with an inquiry, the matter is dropped. If the allegation(s) can be supported, and if sufficient evidence exists to warrant an inquiry, the Office of the Dean of the Graduate School notifies the appropriate Associate Dean (either the Associate Dean of the Graduate School at Storrs or the Associate Dean of the Graduate School at the Health Center). The Office also notifies the accused by Certified Mail of the charge(s). A copy of this Code is sent with the letter of notification to inform the accused of his or her rights and of the hearing and appeals procedures to be followed. The Office also notifies the Dean of the school or college in which the alleged misconduct occurred of the charges.

### D. GRADUATE HEARING COMMITTEE

The Graduate Hearing Committee is composed of three voting members (two members of the graduate faculty and one graduate student). The Executive Committee of the Graduate Faculty Council selects them with advice from appropriate Deans. The appropriate Associate Dean of the Graduate School (Storrs or Health Center) conducts the hearing as a non-voting member. A member of the Hearing Committee cannot have a direct involvement in the case under consideration. The accused will be notified in writing of the composition of the hearing committee and will have the right to object to the appointment of any committee member on the grounds that the member's participation would jeopardize the party's right to a fair hearing. The Associate Dean conducting the hearing will determine whether any objections have merit and will judge whether a panel member will be seated.

The proceeding, although formal, is not a court proceeding and the Hearing Committee will not be bound by the procedures and rules of evidence of a court of law. The Committee's decision is to be made by majority vote and is to be based on clear and convincing evidence submitted at the hearing, including evidence regarding intent.

The Associate Dean will conduct the hearing, ordinarily in private unless the accused student and accuser agree to an open hearing, using the following steps:

1. Identification of the accused student, the person bringing the allegation, any representative of the accused, and the hearing panel.
2. The accused student may make an opening statement.

3. The presentation of evidence by the person alleging the misconduct. Evidence includes written statements, testimony of the person alleging the misconduct, oral testimony of witnesses, physical exhibits, and evidence of intent.
4. Questioning of witnesses and accuser, and rebuttal of evidence.
5. Presentation of evidence by the accused student. Evidence includes written statements, testimony of the accused student, oral testimony of witnesses, physical exhibits, and evidence of intent.
6. Questioning of the accused student and witnesses, and rebuttal of evidence.
7. Recall of any hearing participants.
8. Summation statements by the person alleging the misconduct and by the accused student.

During the hearing the accused student:

1. May decline to make statements. Refusal to answer questions shall not be interpreted as evidence of guilt.
2. May decline to appear at the hearing. Refusal to appear shall not be interpreted as evidence of guilt. The hearing panel will consider the evidence in the absence of the accused student.
3. May be advised for consultation purposes during the hearing. The student's consultant may not address the hearing panel or others at the hearing unless permitted by the Associate Dean conducting the hearing.

The hearing panel's decision is to be forwarded to the student, the person alleging the misconduct, the Dean of the school or college in which the alleged misconduct occurred, and to the Dean of the Graduate School within two weeks from the date of the hearing.

If the student is found not to be responsible for graduate academic misconduct, then no academic consequence may be imposed and the case is considered officially closed, and all records associated with the hearing are removed from the student's permanent academic file.

In the event that the student is found responsible for graduate academic misconduct, the panel may recommend to the Dean of the Graduate School academic and/or university sanctions. The

Dean will examine the record of the hearing and will weigh the severity of the recommended sanction(s) against the seriousness of the student's misconduct. The Dean then will meet with the student before making a final judgment about sanctions. The Dean may impose any academic sanctions and may recommend to the Dean of Students any university sanctions to be imposed.

Decisions of the Dean of the Graduate School can be appealed to the Provost for University Affairs by the student. An appeal is not a new hearing. It is a review of the record of the original hearing. The accused student and a consultant of his or her choice have the right to review the accused student's file and other records of the hearing. An appeal may be sought on two grounds:

1. On a claim of error in the hearing procedure. Appeals on such grounds must be presented, specifically described, in writing within five days (excluding weekends and holidays) of the announcement of the decision.
2. On a claim of new evidence or information material to the case that was not available at the time of the hearing. Appeals on such grounds must be presented, specifically described, in writing within five days (excluding weekends and holidays) of the new evidence having been discovered.

The Provost for University Affairs shall have the authority to dismiss an appeal not sought on proper grounds.

If an appeal is upheld, the Dean of the Graduate School shall refer the case with procedural specifications back to the hearing panel.



**NOTE:** A graduate student is defined as any individual who holds admission to the Graduate School to pursue either a graduate certificate or a graduate degree, as well as any other individual enrolled in a graduate-level course who is not strictly an undergraduate degree or an undergraduate certificate student.

**Approved by the Board of Trustees  
on November 10, 1998.**



# INDEX

## A

"Absent" ("X") Grade, 29  
 Abstract (dissertation), 36  
 Academic Dismissal, 30  
 Academic Misconduct, 214-216  
 Accounting, 38, 69, 71-72  
 Accreditation, 2  
 Acting, 38, 97-99  
 Actuarial Science, 39, 142-145  
 Adams Scholarship, The Frederick G., 18  
 Adding Courses, 28  
 Adidam Memorial Scholarship, The Narashima Rao, 18  
 Adjunct Faculty in The Graduate School, 209  
 Administrative Officers, 5  
 Admission, 8-9  
 Admission of Faculty and Staff, 9  
 Adult Learning, 38, 107-111  
 Advisor(s)  
     Associate, 10  
     Co-Major, 10  
     External Associate, 10  
     Major, 10  
 Advisory System, 10  
 Aetna Graduate Creative Nonfiction Prize, The, 19  
 Aetna Graduate Critical Essay Prize, The, 19  
 Aetna Insurance Company Actuarial Internships, 21  
 Affirmative Action Policy, 2  
 African Studies, 39, 136-137  
 Aging and Human Development, Center on, 20, 133  
 Agricultural and Resource Economics, 38, 43-44  
 Agronomy, 40, 175-176  
 Aid, Financial (see Fellowships and Aid)  
 Alexander-Hewitt Trust Scholarship, The, 21  
 Allied Health, 38, 40, 44-47, 171-72  
 Alloy Science, 40, 142, 150  
 American English Language Institute (UCAELI), 26  
 American Foundation for Pharmaceutical Education (AFPE) Fellowships, 22  
 American Speech and Hearing Association, Council on Accreditation, 89  
 American Studies, 39, 40, 41, 47  
 Analytical Chemistry, 83-85  
 Andrews Fund, The Henry N., 19  
 Animal Science, 38, 48  
 Anthropology, 39, 49-50  
 Application  
     Processing Fee (admission), 9, 11, 14  
     For Admission, 8-9  
     For Degree, 37  
     For Financial Support, 15-23  
 Applied Financial Mathematics, 38  
 Applied Genomics, 38  
 Applied Mechanics, 38, 39, 41, 51, 88, 146  
 Areas of Concentration, 38-41  
 Arjona Memorial Fund, The Jamie Homero, 21  
 Arkava Scholarship, The Harold J., 20  
 Art, 38, 51-52  
 Art and Art History, 51-52  
 Art History, 38, 51-52  
 Arts, Master of (see Degree Programs)  
 Assistantships (Graduate), 15-16  
 Associate Advisor, 10

ATLAS, 17  
 Audiology, 89-91  
 Auditing Courses, 28  
     Fee, 11, 14

## B

Babbidge Graduate School Fellowship,  
     The Homer D., Jr., 17  
 Bacteriology (see Animal Science, Biology, and Pathobiology)  
 Ballard, The Frank W./UConn League Scholarship, 19  
 Ballard Institute and Museum of Puppetry Award, 19  
 Bamford Fund, The Ronald, 19  
 Beck Scholarship, The Audrey P., 19, 22  
 Behavioral Genetics, 38, 53  
 Behavioral Neuroscience, 40, 180-185  
 Berg Scholarship, The Vera Jean, 21  
 Bi-lingual and Bi-cultural Education, 38, 102-107  
 Binding, Thesis and Ph.D. Dissertation, 14, 36  
 Biobehavioral Science, 38, 53  
 Biochemistry, 38, 41, 54, 56-58, 62-68  
 Biological Anthropology, 40, 54, 55-56  
 Biology, 38, 39, 40, 41, 54-59  
 Biomaterials, 39, 142  
 Biomedical Engineering, 38, 41, 60-62  
 Biomedical Science, 38, 40, 62-68  
 Biophysics, 38, 41, 54, 56-58  
 Biotechnology, 39, 41, 54, 68  
 Birdman Scholarship, The Dean Jerome M., 19  
 Bishop-Carder Scholarships, 21, 22  
 Blue Cross/Blue Shield of Connecticut Healthcare Management Scholarship, 20  
 Board Fee, 13, 14  
 Board of Trustees, 5  
 Boehringer Ingelheim Fellowship in Pharmaceutical Sciences, The, 22  
 Boehringer Ingelheim Fellowship in Toxicology, The, 22  
 Boettiger Graduate School Fellowship,  
     The Edward G., 17  
 Booth Graduate Fellowship, The Taylor L., 18  
 Borge Scholarship, The Victor, 19, 21  
 Bosworth Scholarship, The Karl A., 22  
 Botany, 38, 54, 55-56  
 Boyce Valuation Scholarship, The Byrl N., 23  
 Bozzuto Fellowship, The James M., 20  
 Brand Scholarship, The William, 19  
 Brown Scholarship Fund, The Albert Jr., 23  
 Building Owners and Managers Association of Southwestern Connecticut Award, 22  
 Burr Memorial Scholarship, The C.B., 22  
 Burrows Graduate School Fellowship, The Edward Grant, 17  
 Business Administration, 38, 69-80, 137  
 Business Administration, Master of (see Degree Programs)  
 Business Law, 73  
 Bus Service, 26

## C

Calendar, Graduate School, 4  
 Cancellations of Charges, 13  
 Candidacy  
     For Master's Degree, 31  
     For the D.M.A. degree, 33  
     For Ph.D. Degree, 36

Career Services, 25  
 Carter Award, The W. Harrison, 19  
 Cazel Fellowship, The Fred, 21  
 Cell Biology (Health Center), 38, 40, 62-68  
 Cell Biology (Storrs), 38, 41, 54, 56-58  
 Cellular and Molecular Pharmacology (Health Center), 38, 40, 62-68  
 Centers and Institutes, 6  
 Certificate Programs, Graduate, 8-9, 30  
     Geographic Information Systems, 127  
     Graduate Performer's Certificate (Music), 156  
     Women's Studies, 193-194  
 Chemical Engineering, 38, 80-82  
 Chemistry, (see also Biochemistry, Chemical Engineering, Materials Science, and Pharmaceutical Science), 38, 83-85  
 Child Development Laboratories, 133  
 Civil Engineering, 38, 85-88  
 Classics, 152  
 Clinical Engineering Internship, 60  
 Clinical Psychology, 40, 180-185  
 Cognition/Instruction, 39, 40, 111-115, 180-185  
 Cohen and Henes Scholarship, The, 20-21  
 College Work-Study Program (see Federal Work Study)  
 Co-Major Advisors, 10  
 Commencement, 37  
 Commercial Investment, Real Estate Institute University Scholarship, 23  
 Communication, 38, 89-91  
 Communication Processes and Marketing Communication, 38, 89-91  
 Communication Science, 38, 89-91  
 Comparative Literary and Cultural Studies, 38, 41, 91-92, 122, 152  
 Comparative Physiology, 39, 54, 58-59  
 Completion Fees, 14, 36  
 Computer Science and Engineering, 38, 93-95  
 Conducting, 39, 156-158  
 Conferral of Degrees, 37  
 Connecticut Association of Realtors Scholarship, 23  
 Connecticut Geographic Alliance, 20  
 Connecticut Repertory Theatre Patrons' Award, 19  
 Connecticut Society of Certified Public Accountants Ph.D. Scholarship, 18  
 Connelly Nursing Scholarship, The Mary and Katherine, 21  
 Contemporary African Studies, Center for, 26, 71, 136, 137  
 Continuing Registration Courses, Non-Credit, 42-43  
 Continuing Studies, College of, 13, 27, 28  
 Continuous Registration, 27  
     Fee(s) for, 12  
 Control and Communication Systems, 38, 117-121  
 Cooperative Bookstore Account, 13, 14  
 Copyright of D.M.A. Document and Ph.D. Dissertation, 36  
     Fee, 14, 36  
 Cordero Graduate School Fellowship, The Rafael, 17  
 Cornish Scholarship, The Dr. James P., 18  
 Corrosion Science, 39, 142, 150  
 Counseling Psychology, 39, 111-115  
 Counseling Services, 24-25  
 Course Grades, 29  
 Courses, 43-194  
     Adding and Dropping, 28  
     Loads, 27-28

Numbering System, 42  
Prerequisites, 42  
Covenant Scholarship, 22  
Crandall Graduate School Fellowship, The Prudence, 17  
Credit by Examination, 31, 32, 34  
Credits, Transfer of (see Transfer Credits)  
Crystal Science, 39, 142, 150  
Cultural Opportunities, 3  
Cummings Award, The Merrillyn  
Niederwerfer '68, 20  
Curriculum and Instruction, 38, 102-107  
Cytology, 38, 54, 56-58  
Czajkowski Community Nutrition Scholarship, The  
Janina M., 22

## D

Dairy Science (see Animal Science)  
Daniels Loan Fund, The Elna E., 22  
Dean of Students Office Short-Term Emergency Loan  
Fund, 17  
Dean of Students - Office of Special Programs, 24-25  
Deans of the Graduate School, 5  
De Dominicis Graduate Fellowship in Italian  
American History, The Aldo, 20  
Deferment of Fee Payment, 13  
Degree, Application for, 37  
Degree Programs  
Doctor of Education, 39, 107-111  
Doctor of Musical Arts, 32-34, 39, 156-158  
Doctor of Philosophy, 34-37, 38-41 (see also  
specific Field of Study)  
Master of Arts, 30-32, 38-41 (see also  
specific Field of Study)  
Master of Business Administration, 30, 38,  
69-80, 137  
Master of Dental Science, 30-31, 38, 40, 95-97  
Master of Engineering, 30, 39, 121  
Master of Fine Arts, 30, 38, 51-52, 97-99  
Master of Music, 30, 39, 156-158  
Master of Public Administration, 30, 40, 176-179,  
185  
Master of Public Health, 30-31, 40, 185-188  
Master of Science, 30-32, 38-41 (see also specific  
Field of Study)  
Master of Social Work, 30, 31, 40, 70, 188-189  
Degrees Offered, 38-41  
DeLuca Fellowship, The Louis J., 21  
Demund/Dow & Condon Colliers International  
Scholarship, The James M., 23  
Dental Materials, 39, 96, 142  
Dental Science, 30-31, 38, 40, 95-97  
Dental Medicine, School of, 95  
Dental Science, Master of (see Degree Programs)  
Deposit Account, 12, 14  
Design (Dramatic Arts), 38, 97-99  
Design (Mechanical Engineering), 39, 146-149  
Developmental Biology (Health Center), 38, 40, 62-68  
Developmental Biology (Storrs), 38, 41, 54, 56-58  
Developmental Psychobiology, 38, 53  
Developmental (Psychology), 40, 180-185  
Directing, 38, 97-99  
Disabilities, Services for Students with, 25  
Dismissal, Academic, 30  
Dissertation  
Abstract, 37  
Binding Fee, 14, 36  
Copyright Fee, 14, 36

Defense, Oral, 33-34, 37  
D.M.A., 33-34  
Fellowship, 16  
Final Examination  
D.M.A., 33-34  
Ph.D., 37  
Microfilming, 14, 36  
Proposal  
D.M.A., 33  
Ph.D., 36  
Specifications for Preparation, 37  
Doctor of Education, 39, 107-111  
Doctor of Musical Arts Degree, 39, 156-158  
Admission Requirements, 8  
Requirements and Standards, 32-34  
Doctor of Philosophy Degree 38-41 (see also specific  
Field of Study)  
Admission Requirements, 8  
Requirements and Standards, 34-37  
Doctoral Dissertation Extraordinary Expense Award,  
16  
Doctoral Dissertation Fellowship, 16  
Dormitories, 24  
Dramatic Arts, 38, 97-99  
Dramatic Arts Award for Excellence, The Special, 19  
Dropping Courses, 28  
Dual Degree Programs  
D.M.D./Ph.D., 95  
M.B.A./J.D., 70  
M.B.A./M.A. (International Studies), 70-71, 137  
M.B.A./M.I.M. (E.S.C. Lyon, France), 71  
M.B.A./M.S. (Nursing), 71, 160  
M.B.A./M.S.W., 70, 189  
M.D./Ph.D., 63-64  
M.P.H./D.M.D., 185  
M.P.H./J.D., 185  
M.P.H./M.D., 185  
M.P.H./M.S. (Nursing), 160, 185  
M.P.H./M.S.W., 185, 189  
M.S.W./J.D., 189  
Dunphy Award, The Michael, 20, 22, 23  
Dynamics and Control, 39, 146-149

## E

Eaton Graduate School Fellowship, The Hamilton D.,  
17  
Ecological Psychology, 40, 180-185  
Ecology, 38, 54, 55-56  
Ecology and Biological Control, 38, 54, 55-56  
Ecology and Evolutionary Biology, 54, 55-56  
Economics, 38, 99-101  
Education, 38, 39, 40, 102-117  
Educational Administration, 39, 102, 107-111  
Educational Leadership, 39, 102, 107-111  
Educational Psychology, 39, 102, 111-115  
Educational Studies, 39, 102-107  
Educational Technology, 39, 111-115  
Electrical Engineering, 39, 117-121  
Electromagnetics and Physical Electronics, 39, 117-121  
Elementary Education, 38, 102-107  
Elias Memorial Scholarship, The Annie and Wilma, 21  
Emeritus Faculty and Staff, 210-213  
Endocrinology, 39, 54, 58-59  
Energy and Thermal Sciences, 39, 146-149  
Engineering, 38, 39, 41, 121 (see also Biomedical,  
Chemical, Civil, Electrical, Environmental, and  
Mechanical Engineering, as well as Applied  
Mechanics, Fluid Dynamics, Computer Science and

Engineering, Materials Science, and Metallurgy and  
Materials Engineering)  
Engineering, Master of, 30, 39, 121  
English, 39, 122-123  
Entomology, 39, 54, 55-56  
Environmental Engineering, 39, 41, 85, 124-126  
European Studies, 39, 71, 136-137  
European Studies, Center for, 26, 71, 136-137  
Evaluation and Measurement, 39, 111  
Evans Scholarship, The Edward, 21  
Examinations  
Course Credit by, 31, 32, 34  
D.M.A.  
Final, 33-34  
General, 33  
Language, 33, 35  
Exploratory, 31, 32, 34  
For Admission, 8-9  
Master's Final, 32  
Michigan Placement Test, 8  
Ph.D.  
Final, 37  
General, 35-36  
Language, 35  
TOEFL (Test of English as a Foreign Language),  
8, 9  
TSE (Test of Spoken English), 9  
TWE (Test of Written English), 9  
Executive Committee of the Graduate Faculty Council,  
5  
Executive M.B.A. Program, 70  
Exercise Science, 39, 116-117  
Expenses (see Fees and Expenses)  
Experimental Psychology, General, 40, 180-185

## F

Faculty  
Adjunct Graduate, 209  
Course Work Limitation, 28  
Emeritus, 210-213  
Graduate, 195-208  
Research, 208  
Retired, serving as Major Advisor, 10  
Tenured (ineligible for degree), 9  
Family Studies, Human Development and, 39, 133-136  
Federal Stafford Loan, 15, 16  
Federal Work Study, 15, 16  
Fees and Expenses, 11-14  
Application Processing, 9, 11, 14  
Audit, 11, 14  
Bad Check, 14  
Binding, 14, 36  
Board, 13, 14  
Business Administration, School of, 13  
Completion, 14, 36  
Continuous Registration (non-credit), 12  
Cooperative Bookstore Account, 13, 14  
Copyright (D.M.A. and Ph.D. Dissertation), 14,  
36  
Deposit Account, 12, 14  
Extension Course, 13  
General University, 11, 12, 14  
Graduate Activities, 12, 14  
Graduate Matriculation, 12, 14  
Housing, 13, 14  
I.D. Card Replacement, 14  
Infrastructure Maintenance, 12, 14  
In-State Tuition, 11, 12, 14

Insurance, Mandatory Student Health, 14  
 International Sponsored Student, 12, 14  
 Late Registration/Payment, 13, 14  
 Microfilming (Ph.D. Dissertation), 14, 36  
 New England Regional Student Program, 11, 12, 14  
 Out-of-State Tuition, 11, 12, 14  
 Parking, 14  
 Public Laws, Students Attending under, 13  
 Refunds and Cancellations of Charges, 13-14  
 Regional Student Program, 11, 12, 14  
 Reinstatement, 13, 14  
 Residence Hall and Room Deposit, 13, 14  
 Summer Sessions, 13  
 Telephone Service, 14  
 Transit, 12, 14  
 Tuition, 11, 12, 14  
 Fellowships, 15-23  
 Feng Scholarship Fund, the S.Y., 21  
 Field Graduate School Fellowship, The G. Lowell, 17  
 Fields of Study, 38-41  
 Final Examination  
   Master's, 32  
   D.M.A., 33-34  
   Ph.D., 37  
 Finance, 38, 69-80  
 Financial Aid, 15-23  
 Financial Responsibility, 11  
 Fine Arts, Master of (see Degree Programs)  
 Fluid Dynamics, 38, 39, 41, 85, 126, 146  
 Foreign Language Requirement (D.M.A. and Ph.D.), 34, 35  
 France Music Scholarship, The Herbert A., 21  
 French, 39, 152, 153  
 Friends of Music Scholarship, 21  
 Fulbright Program, 26  
 Fund for Legal Studies Fellowship, The, 22

## G

Garton Scholarship Award, The Andrew, 22  
 Geib Graduate Fellowship, The Al, 19  
 General (Business Administration), 38, 69-80  
 General Examination  
   D.M.A., 33  
   Ph.D., 35-36  
 General Experimental Psychology, 40, 180-185  
 General University Fee, 11, 12, 14  
 Genetics, 38, 54, 56-58  
 Genetics, Behavioral, 38, 53  
 Genetics, Human, 38, 53  
 Genetics, Molecular Biology and Biochemistry, 38, 40, 62-68  
 Geographic Information Systems, Graduate Certificate in, 127  
 Geography, 39, 126-128  
 Geological Sciences, 39, 129-131  
 Geology, 39, 129-131  
 Geophysics, 39, 129-131  
 Geotechnical Engineering, 38, 85-88  
 Gerks Award, The Edson B., 18  
 German, 39, 152, 153-154  
 Gerontology, Certificate Program in, 133-134  
 Gerontology, Graduate Research  
   Fellowships in, 20, 134  
 Gifted and Talented Education, 39, 111-115  
 Gilman Scholarship, The Ralph and Ruby, 21  
 Grade Point Average, 29, 30  
   Required for Admission, 8

Grading System, 29  
 Graduate Activities Fee, 12, 14  
 Graduate Assistantships, 15-16  
   Registration for Courses, 27-28  
 Graduate Certificate Programs, 8-9, 30  
   Geographic Information Systems, 127  
   Graduate Performer's Certificate (Music), 156  
   Women's Studies, 193-194  
 Graduate Education and Research: History, 7  
 Graduate Education and Research, Integrity in, 214-216  
 Graduate Faculty Council, 5, 7  
 Graduate Matriculation Fee, 12, 14  
 Graduate Residences, 24  
 Graduate Student Senate, 25  
   Short Term Loan Fund, 17  
 Grants (see University Fellowships and Other Aid)

## H

Hartford Life Insurance Company Actuarial Internships, 21  
 Hartford Society of Financial Analysts' Scholarship, The, 19  
 Harwood Memorial Real Estate Scholarship, 23  
 Health  
   Insurance, Mandatory Student, 14  
   Services, 24  
 Health Care Financial Management Consulting Scholarship, 20  
 Health Care Management, 38, 69-80  
 Health Center Programs, 40, 62-68, 95-97, 185-188  
 Health Center at Farmington, University, 40, 62-68, 95-97, 185-188  
 Health Insurance, Mandatory Student, 14  
 Health Promotion, 45-47  
 Health Services, 24  
 Health Systems Management, 74-75  
 Hearing and Appeal Procedures, 30  
 Hebrew, 138, 154  
 Heilig Graduate Assistantship in Piano, The Alice Murray, 21  
 Heilig Scholarship, The Charles, Alice (Murray), and Cheryl A., 21  
 Hermann Graduate School Fellowship, The Heinz, 17  
 Hicks Scholarship, The Minnie Helen, 21  
 Higher Education Administration, Professional, 40, 102, 107-111  
 Hinkel Department of Theatre Award, The Cecil E., 19  
 Historical Musicology, 39, 156-158  
 History, 39, 131-133  
 History and Philosophy of Education, 39, 102-107  
 History of the University, 3  
 Hormones and Behavior, 38, 53  
 Horticulture, 40, 175-176  
 Housing, 24  
   Fee, 13, 14  
 Human Development and Family Studies, 39, 133-136  
 Human Genetics, 38, 53  
 Human Resources (Business Administration), 38, 69-80  
 Hunyadi Fund, The Alfred, 19

## I

I.D. Card Replacement Fee, 14  
 Ilg Fellowship, The Albert, 22

Immunology, 38, 40, 62-68  
 "Incomplete" Grade, 29  
 Industrial Engineering Internship, 60-61  
 Industrial/Organizational Psychology, 40, 180-185  
 Industrial Statistics, 40, 191-193  
 Infirmary (see Health Services)  
 Information Technology Services, University, 7  
 Infrastructure Maintenance Fee, 12, 14  
 Inorganic Chemistry, 83-85  
 In-State Tuition, 11, 12, 14  
 Institute of Real Estate Management Foundation Award, 23  
 Institutes, 6, 54-55  
 Instructional Media and Technology (see Educational Technology)  
 Insurance, Mandatory Student Health, 14  
 Integrity in Graduate Education and Research, 214-216  
 Interdisciplinary Programs, 41  
 International Business, 38, 69-80  
 International Services and Programs, 26  
 International Sponsored Student Fee, 12, 14  
 International Students  
   Admission, 8-9  
   Aid for, 17  
   English Proficiency Requirement, 8-9  
   Financial Assistance, 15-23  
   Housing, 24  
   Insurance, Mandatory Health, 14  
   Language-Conditional Status, 8  
   Office of International Affairs, 26  
 International Studies, 39, 41, 70-71, 136-137  
 International Studies and M.B.A. Dual Degree Program, 70-71, 136-137  
 Italian, 39, 152, 154-155  
 Italian History and Culture, 39, 136-137

## J

Jackson Memorial Fellowship, The Gerald J., 22  
 Jakobson Graduate School Fellowship, The Roman, 17  
 Johnson Graduate School Fellowship, The Julian F., 17, 22  
 Judaic Studies, 39, 41, 138

## K

Kaplitz Memorial Scholarship Fund, The Mae K., 21  
 Katter/Palillo Scholarship, 19  
 Kim Fellowship, The Ipyong, 22  
 Kinesiology, 39, 116-117  
 Kinnard, Jr./CREUES Alumni Scholarship, The William N., 23  
 Kogan Fellowship, The Norman, 22

## L

Landscape Architecture, 40, 175-176  
 Language (Psychology), 40, 180-185  
 Language Requirements  
   International Student, 8, 9  
   D.M.A., 33, 35  
   Ph.D., 35  
 Languages (see Modern and Classical Languages)  
 IASPAU, 17  
 Late Registration/Payment Fee, 13, 14



Latin, 152  
 Latin American History, 39, 131-133  
 Latin American Studies, 39, 71, 136-137  
 Latin American and Caribbean Studies, Center for, 26, 71, 137  
 Latin American Studies Consortium of New England, 137  
 Laughlin Scholarship, The Leslie Finney, 18  
 Learning Disabled Students, Services for, 25  
 Legal Studies Fellowships, Fund for, 22  
 Leisure, Social Science of Sport and, 39, 116-117  
 Lepow Graduate School Fellowship, The Irwin H., 17  
 Liberman Scholarship, The Isabelle, 22  
 Library, The Homer D. Babbidge, 7  
 Lindsay Scholarship, The T.K., 18  
 Linguistics, 39, 138-140  
 List/Carrol Glenn Scholarship, The Eugene, 21  
 Loans, 15-17  
 Lougee Graduate School Fellowship, The Robert W., 17  
 Luckey Memorial Fund, The David, 21

## M

Major Advisor, 10  
 Co-Major Advisors, 10  
 Resignation of, 10  
 Managed Care Pharmacy, 39, 168  
 Management, 38, 69-80  
 Management Consulting, 38, 69-80  
 Management of Technology, 38, 69-80  
 Manter Fund, The Jerould, 19  
 Manufacturing, 39, 146-149  
 Marine Sciences, 140-141  
 Marital and Family Therapy, Center for, 133  
 Marketing, 38, 69-80  
 Marketing Communication, Communication Processes and, 38, 89-91  
 Marks Fellowship, The Harry J., 20  
 Master's Degree (see also specific Field of Study)  
 Admission Requirements, 8-9  
 Requirements and Standards, 30-32  
 Materials Science, 39, 41, 142  
 Mathematics, 39, 142-145  
 Matterson Scholarship, The Lloyd D., 22  
 McPeck Critical Essay Prize, The Kathleen Gibson, 19  
 Mead Fellowship, The Robert G., Jr., 21  
 Mechanical Engineering, 39, 146-149  
 Medical Anthropology, 49  
 Medical Sociology, 189  
 Medicinal and Natural Products Chemistry, 39, 165-168  
 Medicine, School of, 63-64  
 Medieval European History, 39, 131-133  
 Medieval Studies, 39, 41, 150  
 Messner/School of Business Administration  
 Scholarship and Fund, The Stephen D., 19, 23  
 Metallurgy and Materials Engineering, 39, 150-152  
 Microbiology, 39, 54, 56-58  
 Microfilming (D.M.A. Document and Ph.D. Dissertation), 36  
 Fee, 14, 36  
 Misconduct, Academic, 214-216  
 Modern and Classical Languages, 152-156  
 Modern European History, 39, 131-133  
 Molecular and Cell Biology, 54, 56-58  
 Morphology (Botany), 38, 54, 55-56

Morphology and Physiology (Entomology), 39, 54, 55-56  
 Multicultural Scholars Program, 17  
 Music, 39, 156-158  
 Music Education, 39, 102, 156-158  
 Music, Master of (see Degree Programs)  
 Musical Club of Hartford, Inc. – Evelyn Bonar Storrs  
 Piano Scholarship, 21  
 Music Theory and History, 39, 156-158

## N

Nalwalk Memorial Award, The Andrew J., 20, 21  
 Named Graduate School Fellowships, 17  
 Natural Products Chemistry, 38, 39, 54, 55-56, 165-168  
 Natural Resources: Land, Water, and Air, 39, 158-159  
 Neag School of Education, 102-117  
 Nelsova Scholarship, The Zara, 21  
 Neurobiology, 39, 54, 58-59  
 Neurochemistry, 38, 53  
 Neuromorphology, 38, 53  
 Neuropsychopharmacology, 38, 53  
 Neuroscience (Health Center), 38, 40, 62-68  
 Neurosciences (Storrs), 38, 39, 40, 41, 53, 54, 166, 181  
 Neurosciences Area of Concentration Fellowships, 21  
 New England Board of Higher Education (NEBHE)  
 Regional Student Program, 11, 12  
 Non-Degree Course Work (inclusion on Plan of Study), 31, 32, 34  
 Non-Degree Study, 9  
 Nurse Traineeships, Professional, 21-22  
 Nursing, 39, 160-163  
 Nursing Endowment Fund for Excellence, The School of, 21  
 Nutritional Science, 39, 163-164

## O

Oceanography, 39, 140-141  
 Operations and Information Management, 38, 69-80  
 Oral Biology, 38, 62-68, 95-97  
 Organic Chemistry, 83-85  
 Out-of-State Tuition, 11, 12, 14  
 Outstanding Scholars Program, 17-18, 22

## P

Paleobotany, 38, 54, 55-56  
 Parasitology, 40, 54, 55-56  
 Parking  
 Fee, 14  
 Regulations, 25-26  
 Pass/Fail, 29  
 Pathobiology, 39, 164-165  
 Pathology, 39, 164-165  
 Speech, 89-91  
 Penner Fund, The Lawrence R., 19  
 Performance (Music), 39, 156-158  
 Performance/Production (Dramatic Arts), 38, 97-99  
 Performer's Certificate, Graduate (Music), 156  
 Personality (Psychology), 40, 180-185  
 Pharmaceutical Science, 39, 165-168  
 Pharmaceutics, 39, 165-168  
 Pharmacology (Health Center), Cellular and Molecular, 38, 40, 62-68

Pharmacology and Toxicology (Storrs), 39, 165-168  
 Pharmacy Administration, 168-169  
 Pharmacy Practice, 168-169  
 Phi Alpha Alpha Fellowship, 22  
 Philosophy, 39, 169-170  
 Philosophy, Doctor of (see Degree Programs)  
 Phycology, 38, 54, 55-56  
 Physical Chemistry, 83-85  
 Physical Education (see Kinesiology)  
 Physically Disabled Students, Services for, 25  
 Physical Therapy, 8, 39, 171-172  
 Physics, 39, 172-175  
 Physiology and Neurobiology, 39, 54, 58-59  
 Physiology of Reproduction, 38, 48  
 Plan of Study  
 Master's Degree, 31  
 D.M.A. Degree, 32-33  
 Ph.D. Degree, 34-35  
 Plant Breeding, 40, 175-176  
 Plant Cell and Molecular Biology, 38, 41, 54-58  
 Plant Ecology, 38, 54, 55-56  
 Plant Environment, 40, 175-176  
 Plant Physiology, 38, 41, 54-58  
 Plant Science, 40, 175-176  
 Plant Systematics, 38, 54, 55-56  
 Poellein Scholarship, The John, 21  
 Political Science, 40, 176-179  
 Polymer Science, 40, 41, 180  
 Portuguese, 155  
 Predoctoral Fellowships, 16  
 Professional Higher Education Administration, 40, 102, 107-111  
 Proposal, Dissertation  
 D.M.A., 33  
 Ph.D., 36  
 Provisional Graduate Status, 8  
 Prudence Crandall Graduate School Fellowship, 17  
 Psychology, 40, 180-185 (see also Biobehavioral Science and Education)  
 Public Administration, 40, 185  
 Public Administration, Master of (see Degree Programs)  
 Public Health, 40, 180-185  
 Public Health, Master of (see Degree Programs)  
 Puppetry, 38, 97-99

## R

Rafael Cordero Graduate School Fellowship, 17  
 Real Estate, 22, 38, 69-80  
 Real Estate and Urban Economics, Center for, 23  
 Refunds and Cancellations of Charges, 13-14  
 Regional Student Program, 11, 12  
 Registration, 27-28  
 Deadline, 27  
 Late Fee, 13, 14  
 Procedures, 27-28  
 Reinstatement Fee, 13, 14  
 Related Area (Ph.D.), 35  
 Research Advisory Councils, 5-6  
 Storrs and Regional Campuses, 6  
 Health Center, 6  
 Research Professors, 208  
 Research Scientists, 208  
 Residence Hall Fee and Room Deposit, (see also Housing) 13, 14

## Residence Requirement

D.M.A., 32  
Ph.D., 34

Reynolds Graduate School Fellowship, The Charles A., 17, 22

Ribicoff Fellowship, The Governor Abraham, 22

Ribicoff Graduate Fellowship for the Study of Economic Policy, The Abraham, 19

Richardson-Vicks/A. Francis Summa Memorial Award, 22

Romo-Arregui Memorial Scholarship, The Josefina, 21

Ruppen Graduate School Fellowship, The James A., 17

## S

Sadow Graduate School Fellowship, The Harvey S., 17

Salerno-Sonnenberg Scholarship, The Nadja, 21

Satisfactory/Unsatisfactory Grading, 29, 35, 42

Scholarships, 15-23

Scholastic Standards, 29-30

School Psychology, 39, 111-115

Schor Memorial Scholarship, The Valerie M., 19

Science, Master of (see Degree Programs)

Scottron Scholarship, The Jan Keiley, 19

Secondary Education, 38, 102-107

Seniors Taking Graduate Courses, 27

Shaw Scholarship, The Stephanie H., 22

Shell Fellowship, 22

Sherman Scholarship, The Roger, 20

Shivers Memorial Award in the Arts, The Rhoda, 20

Sixth-Year Diploma in Professional Education, 8, 102, 107, 111

Slater Fund, The James A., 19

Social Foundations of Education, 39, 102-107

Social (Psychology), 40, 180-185

Social Science and Health Care, 38, 40, 49-50, 189-191

Social Science of Sport and Leisure, 39, 116-117

Social Work, 40, 188-189

Social Work, Master of (see Degree Programs)

Society of Industrial and Office Realtors/Samuel F. Pierson Scholarship, 23

Sociology, 40, 189-191

Soil Science, 40, 175-176

Spanish, 40, 152, 155-56

Special Education, 41, 102, 111-115

Special Facilities, 7 (see also specific Field of Study)

Special Graduate Student Fellowships, 17

Special Programs, Dean of Students - Office of, 24-25

Speech, Language, and Hearing, 38, 89-91

Speech Pathology and Audiology (see Communication Sciences)

Sport, Leisure, and Exercise Science (see Kinesiology)

Sport and Leisure, Social Science of, 39, 116-117

Staff, Professional

Admission, 9

Course Load Limitation, 28

Emeritus, 210-213

Stafford Loan, Federal, 15, 16

Standards and Degree Requirements, 29-37

Statistics, 40, 191-193

Stevens Award for Poetry, The Wallace, 19-20

Structural Engineering, 38, 85-88

Stuart Graduate School Fellowship, The P. Brian, 17

Student Labor Program, 16

Student Responsibility, inside front cover

Student Transit Fee, 12, 14

Stutzman Graduate School Fellowship, The LeRoy F., 17

Summer Fellowships, 16

Summer Session Fees, 13

Support, Financial, 15-23

Supporting Area of Study (Ph.D.), 35

Survey Research, 40, 41, 176-179, 185, 189-191

Systematics (Entomology), 39, 54, 55-56

Systematics and Evolution (Zoology), 40, 54, 55-56

Systematics, Plant (Botany), 38, 54, 55-56

Szeryng Scholarship, The Henryk, 21

## T

Taylor Award, The Ronald L., 23

Technical Direction (Dramatic Arts), 38, 97-99

Telephone Service, 14

Tenzer Fellowship, The Morton J., 22

Termination of Status, 10, 29-30

Tests (see Examinations)

Theater (see Dramatic Arts)

Theater History and Criticism, 38, 97-99

Theory (Music), 39, 156-158

Thesis (Master's)

Binding Fee, 14

Preparation, 31-32

Time Limits

Master's Degree, 31

D.M.A. Degree, 32

Ph.D. Degree, 34

Tinker Scholarship, The Walter H. and Rowena R., 21

Torgerson Fellowship, The Harold, 19

Toxicology (Storrs), 39, 165-168

Trainer Fund, The Francis R., 19

Transcripts

For Admission, 8-9

Supplementary and Departmental, 9

University of Connecticut (requests for), 24

Transfer Credits

Continuous Registration Requirement and, 27

Toward Master's Degree, 31

Toward D.M.A. Degree, 33

Toward Ph.D. Degree, 35

Transit Fee, 12, 14

Transportation and Urban Engineering, 38, 85-88

Trustees, Board of, 5

Tuition Assistance Program for Outstanding Master's Degree Students, 16

Tuition Fee, 11, 12, 14

## U

UCAELI (American English Language Institute), 26

Unclassified Graduate Students (see Non-Degree Study)

Undergraduate Taking Graduate Courses, 27

United Bank and Trust Company Scholarship, 19

United States History, 39, 131-133

University of Connecticut, Introduction to, 3

University Health Center at Farmington (see Health Center at Farmington, University)

University Predoctoral Fellowships, 16

University Transportation Center Fellowship for Transportation Studies, 18

## V

Van Dusen Scholarship, The Albert E. and Wilda E., 20

Veterans Administration Educational Assistance and Tuition Waiver Program, 17

Veterans' Benefits, 11, 17

Virology, 39, 164-165

von der Mehden Scholarship, The J. Louis, 21

## W

Walker Outstanding Teaching Assistant Award, The Marshall J., 22

Wallis III Award, The George B., 19

Waring Memorial Scholarship, The Charles E., 18

Waugh Scholarship, The Albert E., 19

Web Site, inside front cover

Wetzel Fund, The Ralph M., 19

Whetten Fellowship, The Nathan L., 21

Winkler Israel Study Award, The, 21

Withdrawal Procedures, 28

Women's Studies, Graduate Certificate in, 193-194

Work-Study Program, Federal, 16

World Wide Web Site, inside front cover

## Z

Zeaman Graduate School Fellowship, The David, 17

Zoology, 40, 54, 55-56