



IBA 563
ASPECTS OF
ANIMAL
MECHANICS

2006-2008 GRADUATE BULLETIN



ANT 511
PALEOLITHIC
ARCHAEOLOGY

POL 674 Advanced Topics: American Politics II

A continuation of POL 673.
3 credits, ABCF grading
May be repeated for credit

POL 675 Advanced Topics: Comparative Politics I

Readings and research papers on topics in comparative politics. Particular attention is given to concepts and methods identified with the field.

Prerequisite: POL 553; admission to the Political Science Ph.D. program
3 credits, ABCF grading
May be repeated for credit

POL 676 Advanced Topics: Methods I

A course reviewing the literature and methodology of specific areas of political science research. The course relates directly to research applications and provide students with an opportunity to apply advanced research tools to selected substantive problems.

Prerequisite: Permission of graduate program director; admission to the Political Science Ph.D. program
3 credits, ABCF grading
May be repeated for credit

POL 678 Political Decision Making

Review of the literature and methods related to a topic or problem in contemporary political science, voting behavior, issue formation, interest groups, political economy, or personality.

Prerequisite: POL 605, 608
3 credits, ABCF grading
May be repeated for credit

POL 679 Advanced Topics: Political Psychology/Behavior II

A continuation of POL 678.
3 credits, ABCF grading
May be repeated for credit

POL 680 Directed Study

Individual studies under the guidance of a faculty member. Subject matter varies according to the needs of the student.

Prerequisite: Permission of instructor and graduate program director; admission to the Political Science Ph.D. program
1-6 credits, ABCF grading
May be repeated for credit

POL 681 Directed Study

Individual studies under the guidance of a faculty member. Subject matter varies according to the needs of the student.

Prerequisite: Permission of instructor and graduate program director; admission to the Political Science Ph.D. program
1-9 credits, S/U grading
May be repeated for credit

POL 690 Research Colloquium

Students participate in weekly departmental colloquia where they serve as discussants of research reports presented by individual faculty members or outside investigators reporting on current research.

Prerequisite: Permission of graduate program director
3 credits, ABCF grading

POL 691 Research Practicum I

A course actively involving students in an ongoing research project under the direction of a principal investigator. Students participate in all stages of the research project and are required to prepare a research report on one aspect of the project.

3 credits, S/U grading

POL 692 Research Practicum II

A continuation of POL 691. Students actively participate in either a second research project, where they will again prepare a research report, or continue their participation in the same project, where they are then assigned a subset of data for analysis or carry out a specific research aim of the project.

Prerequisite: POL 691
3 credits, S/U grading
May be repeated for credit

POL 693 Practicum in Teaching

POL 699 Dissertation Research on Campus
Dissertation research under direction of advisor.

Prerequisite: Advancement to candidacy (G5); permission of Graduate Program Director; major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

POL 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

POL 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits,
S/U grading
May be repeated for credit

POL 800 Summer Research

May be repeated for credit

School of Professional Development (SPD)

Dean: Paul J. Edelson, Ward Melville Social and Behavioral Sciences Building N-203 (631) 632-7049

Associate Dean and Teacher Certification Officer: Marvin J. Glockner, Ward Melville Social and Behavioral Sciences Building N-223 (631) 632-7055

Assistant Dean for Curriculum and Academic Planning: Carolyn Jankowski, Ward Melville Social and Behavioral Sciences Building N-215 (631) 632-9159

Assistant Dean for Budget and Administration: Joyce Wellinger, Ward Melville Social and Behavioral Sciences Building N-203 (631) 632-7053

Director of Admission and Advisement: Judith Daly, Ward Melville Social and Behavioral Sciences Building N-201 (631) 632-7751

Advanced Graduate Certificates (AGCs) awarded: AGC in Coaching; AGC in Educational Computing; AGC in Human Resource Management; AGC in Information Systems Management; AGC in Operations Research; and AGC in Waste Management. Post-Master's AGCs in School Building Leader; School District Leader; and School District Business Leader

Degrees awarded: Master of Arts in Liberal Studies (MA/LS); Master of Arts in Teaching (MAT): MAT in English, grades 7-12; MAT in Foreign Languages, grades 7-12 (French, Italian, German, Russian, or Spanish); MAT in Mathematics, grades 7-12; MAT in Science, grades 7-12 (Biology, Chemistry, Earth Science, or Physics); MAT in Social Studies, grades 7-12; Master of Professional Studies (MPS), with a concentration in Human Resource Management or Waste Management

The School of Professional Development (SPD) offers graduate degree and Advanced Graduate Certificate programs for part-time and full-time students. To meet the needs of working professionals, SPD schedules more than 200 courses in the evening, online, and off-campus each semester. SPD's Master of Arts in Liberal Studies program is the University's largest graduate degree program, with more than 2,000 matriculated students. This program is also offered in a fully online, asynchronous format that has been approved by the New York State Department of Education. Other graduate degree programs include the Master of Professional Studies and five different Master of Arts in Teaching programs covering 12 content fields.

SPD offers the largest Educational Leadership program within New York State. Completion of this Post-Master's Advanced Graduate Certificate program leads to a credential with certification and licensure in one of three educational leadership areas: School Building Leader, School District Leader, and School District Business Leader. SPD also offers Advanced Graduate Certificate programs that focus on the needs of the region and emerging professions in Coaching, Educational Computing, Human Resource Management, Operations Research, Waste Management, and Information Systems Management.

For more information, visit the SPD Web site at www.stonybrook.edu/spd.

Master of Arts in Liberal Studies (MA/LS): Traditional Program

The Master of Arts in Liberal Studies program is an interdisciplinary degree

program that examines issues and themes in the arts and humanities, social and behavioral sciences, and natural and applied sciences. Developed primarily for adult students who seek educational enrichment and professional development on a part-time evening basis, the MA/LS is not structured specifically to serve as a prerequisite to a more advanced degree. The program consists of 33 graduate credits of coursework. Courses are offered in the evening, on Saturdays, online, and at various off-campus locations on Long Island and in Manhattan.

This degree is acceptable as a functionally relevant master's degree that may be used to achieve professional certification through the New York State Education Department. For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/mals.

Master of Arts in Liberal Studies (MA/LS): Fully Online Program

The MA/LS is also available in a completely online, asynchronous format. By providing courses through its Electronic Extension Program (EEP), SPD makes it possible for students with busy schedules to pursue graduate study at Stony Brook without having to come to campus. MA/LS online students take the same courses, learn from the same distinguished faculty, and earn the same degree credit as their on-campus counterparts. This degree program has been approved by the New York State Education Department and accredited by the Middle States Association.

The 33-credit degree program is substantially the same as the traditional

MA/LS, however, areas of study are limited to the online course offerings. Because SPD expands its online offerings each semester, prospective students should visit the MA/LS online Web site for program requirements and a sample course selection. The address is www.stonybrook.edu/spd/malsonline.

Master of Professional Studies (MPS)

The Master of Professional Studies has been developed as the professional studies counterpart to the Master of Arts in Liberal Studies. It is an interdisciplinary degree whose core curriculum focuses on the theoretical structure and methodology of social science disciplines and their application to professional studies. Two concentrations are available within this program: Human Resource Management or Waste Management. The program stresses the application of research and experience to complex social and political issues. Structured primarily for working adults who seek educational study and professional development on a part-time evening basis, the MPS does not specifically serve as a prerequisite for a more advanced degree.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/mps.

Master of Arts in Teaching (MAT)

Each Master of Arts in Teaching program includes a set of professional education courses and a concentration in an academic discipline. Students who complete an MAT program satisfy both the registered and approved program requirements for New York State sec-

ondary grades 7-12 provisional teacher certification in MAT subject areas (i.e., English, French, German, Italian, Russian, Spanish, Biology, Chemistry, Earth Science, Mathematics, Physics, and Social Studies) and the master's degree requirement for permanent certification.

All advisement on how to meet requirements for state certification by the alternate route (i.e., minimum requirements) must be obtained from the State Education Department in Albany, (518) 474-3901, or visit NYSED online at <http://ohe32.nysed.gov/tcert>.

Master of Arts in Teaching (MAT): English

Offered through SPD in collaboration with the Professional Education Program and the English Department, the Master of Arts in Teaching English is designed as a course of study leading to New York State certification for teaching English in the secondary schools (grades 7-12). This program consists of 41 credits of graduate coursework.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/mat/english.html. Prospective students can also address inquiries to Dr. Kenneth Lindblom, Director, MAT in English Program, Department of English, Stony Brook University, Stony Brook, New York 11794-5350; or telephone (631) 632-7403 or 632-7055.

Master of Arts in Teaching (MAT): Foreign Languages

French, German, Italian, Russian, or Spanish

Offered through SPD in collaboration with the Professional Education Program and the Department of European Languages, Literatures and Cultures, the Master of Arts in Teaching Foreign Languages programs are individually designed to lead to New York State certification for teaching French, German, Italian, Russian, or Spanish in the secondary schools (grades 7-12). The French, German, Italian, Russian, and Spanish MATs each consist of 44 graduate credits of coursework.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/mat/fl.html. Prospective students can also address inquiries to Dr. Sarah Jourdain, Director, MAT in Foreign Language

Programs, Stony Brook University, Stony Brook, New York 11794-3359; or telephone (631) 632-7440 or 632-7055.

Master of Arts in Teaching (MAT): Mathematics

The Master of Arts in Teaching Mathematics is a course of study leading to New York State certification for teaching Mathematics in the secondary schools (grades 7-12). This 42-credit program, offered in collaboration with the University's Department of Mathematics and Professional Education Program, is designed for those who have little or no previous coursework in education or formal classroom teaching experience.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/mat/math.html. Prospective students can also address inquiries to Dr. Bernard Maskit, Director, MAT in Mathematics Program, Stony Brook University, Stony Brook, New York 11794-3651; or telephone (631) 632-8257 or 632-7055.

Master of Arts in Teaching (MAT): Science

Biology, Chemistry, Earth Science, or Physics

Offered by the Departments of Biochemistry and Cell Biology, Chemistry, Geosciences, Physics and the Professional Education Program in collaboration with SPD, these Master of Arts in Teaching programs are individually designed to lead to New York State certification for teaching Biology, Chemistry, Earth Science, or Physics in the secondary schools (grades 7-12). Each program consists of a total of 41 graduate credits of coursework.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/mat/science.html, or contact the appropriate program director at the phone numbers listed below:

Biology MAT: Dr. Zuzana Zachar (631) 632-8970

Chemistry MAT: Dr. Robert Kerber (631) 632-7940

Earth Science MAT: Dr. Gilbert Hanson (631) 632-8210

Physics MAT: Dr. Robert McCarthy (631) 632-8086

Master of Arts in Teaching (MAT): Social Studies

Offered through SPD in collaboration with the Professional Education Program and the Department of History, the Master of Arts in Teaching Social Studies, with a concentration in history, is designed as a course of study leading to New York State certification for teaching social studies in the secondary schools (grades 7-12). The program consists of a total of 41 graduate credits of coursework.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/mat/ss.html. Prospective students can also address inquiries to Dr. Lawrence Frohman, Director, MAT in Social Studies Program, Stony Brook University, Stony Brook, New York 11794-4333; or telephone (631) 632-7686 or 632-7055.

Educational Leadership Program

SPD has the largest Educational Leadership program in New York State. The program is open to teachers who have at least three years of full-time teaching experience and have already earned a master's degree. Completion of this Post-Master's Advanced Graduate Certificate program leads to a credential with certification and licensure in one of three educational leadership areas: School District Leader, School Building Leader, or School District Business Leader.

School District Leader (SDL) Post-Master's Advanced Graduate Certificate

This Post-Master's Advanced Graduate Certificate program prepares educators for advancement to positions at the central office level, including superintendent of schools, district superintendent, assistant superintendent (instruction, business, personnel), administrative assistant on the district level, subject coordinator (K-12), district director (athletics, art, music, etc.), district director of guidance, and director of PSEN students. The 36-credit program is offered in collaboration with the University's Professional Education Program. Courses in this Post-Master's Advanced Graduate Certificate program can be used to complete some requirements toward the Ed.D. at St.

John's University and the Ed.D. in Educational Administration at Hofstra University.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/sad/min/sdl.html. Prospective students can also address inquiries to: Dr. Robert Moraghan, School of Professional Development, SBS Building, N-223, Stony Brook University, Stony Brook, NY 11794-4310; e-mail: moraghan@math.sunysb.edu; telephone: (631) 632-7702.

School Building Leader (SBL) Post-Master's Advanced Graduate Certificate

Educators interested in pursuing a challenge beyond the classroom are invited to apply to this Post-Master's Advanced Graduate Certificate program, which provides an up-to-date curriculum that can prepare you for such advanced positions as building principal, assistant building principal, department chairperson, guidance department chairperson, or dean of students. This 30-credit program is offered in collaboration with the University's Professional Education Program. Courses in this program can be used to complete some requirements toward the Ed.D. at St. John's University and the Ed.D. in Educational Administration at Hofstra University.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/sad/min/sbl.html. Prospective students can also address inquiries to: Dr. Robert Moraghan, School of Professional Development, SBS Building, N-223, Stony Brook University, Stony Brook, NY 11794-4310; e-mail: moraghan@math.sunysb.edu; telephone: (631) 632-7702.

School District Business Leader (SDBL) Post Master's Advanced Graduate Certificate

This Post-Master's Advanced Graduate Certificate program prepares professionals from the corporate world, public service agencies, and charitable institutions for access and advancement to positions in a school district central office as assistant superintendent for school business positions. This 36-credit program is offered in collaboration with the University's Professional Education Program. Courses in this program can be used to complete some requirements toward the Ed.D. at St. John's University and the Ed.D. in Educational

Administration at Hofstra University.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/sdbl/index.html. Prospective students can also address inquiries to: Dr. Robert Moraghan, School of Professional Development, SBS Building, N-223, Stony Brook University, Stony Brook, NY 11794-4310; email: moraghan@math.sunysb.edu; telephone: (631) 632-7702.

Advanced Graduate Certificate (AGC) Programs

SPD offers a variety of Advanced Graduate Certificate programs for individuals who seek a specialized professional credential beyond the baccalaureate degree. Programs are currently offered in the following areas of study: Coaching, Educational Computing, Human Resource Management, Information Systems Management, Operations Research, and Waste Management. Credit requirements range from 18 to 21 credits, some of which may be applicable toward a master's degree. Please consult with an SPD academic advisor to determine how the graduate courses that meet the requirements for each of these certificates may, where appropriate, also be used to satisfy SPD degree program requirements.

Advanced Graduate Certificate (AGC) in Coaching

The Division of Physical Education and Athletics, in collaboration with SPD, is authorized by the State Education Department to offer an Advanced Graduate Certificate in Coaching. This 18-credit program extends the originally approved 12-credit coaching accreditation curriculum to include a three-credit field study practicum and a three-credit elective course.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/coaching.html. Prospective students can contact Judith Daly, Director, Academic Services and Advisement, SPD, at (631) 632-7751.

Advanced Graduate Certificate (AGC) in Educational Computing

The School of Professional Development, in collaboration with the Department of Technology and Society part of the College of Engineering and Applied Sciences, offers an 18-credit

Advanced Graduate Certificate program in Educational Computing.

This certificate is designed to provide background training and intervention techniques for students who wish to become proficient in educational computing in either an education-based or business/industry-based situation.

The education track will train the student to become a leader in the innovative use of computers and computer-based technologies in a school setting. Graduates of this program may assume roles such as curriculum developers, coordinators of instructional computing, or technology planners that help schools select appropriate hardware and software to support technology enriched curricula.

The business/industry track will train the student to become a leader in the use of the computer as a tool in training and education. In addition, the program will help the student to become an expert in the teaching of applications software such as spreadsheets and databases. Graduates of this program may assume roles as teachers of applications software, multi-media developers, experts on human-computer interface, or experts on the infusion of computer-based technologies in various business/industry environments.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/edcomputing.html. For academic questions, prospective students may contact Professor David Ferguson, Chair, Department of Technology and Society, at (631) 632-8763.

Advanced Graduate Certificate (AGC) in Human Resource Management

Offered in collaboration with the W. Averell Harriman Center for Human Resource Management, this program provides the educational background necessary to make informed decisions in management and policy analysis as related to human resource issues. It is designed for private- and public-sector managers, industrial relations specialists, union representatives, human resource/personnel managers, and employee training professionals. Eighteen of the 21 credits required to earn this Advanced Graduate Certificate may be applied toward SPD's Master of Professional Studies degree.

For complete admission and program

requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/hrm.html. For academic questions, prospective students may contact Jeff Casey, Director, Human Resource Management Specialization, College of Business, at (631) 632-7179.

Advanced Graduate Certificate (AGC) in Information Systems Management

This 18-credit program provides an educational opportunity to combine management education with technical training in specific areas related to information systems. Offered in collaboration with the W. Averell Harriman School for Management and Policy, this graduate certificate program should interest students from various professional fields. For students without formal training in management of information systems, the program can be used as an introduction to the field. For students with management experience, the program offers specialized courses in selected subjects such as systems analysis and design, database management, telecommunications, expert systems, and personal computing. For technical workers in the information systems field without formal managerial training, the program offers managerial courses and a professional credential.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/ism.html. For academic questions, prospective students may contact T. Owen Carroll, College of Business, at (631) 632-7476.

Advanced Graduate Certificate (AGC) in Operations Research

This certificate program in Operations Research is offered through SPD in collaboration with the Department of Applied Mathematics and Statistics in the College of Engineering and Applied Sciences and correlates with the M.S. in Applied Mathematics and Statistics as well as the Master of Arts in Liberal Studies offered through SPD.

The Advanced Graduate Certificate in Operations Research provides students with the fundamental applied mathematics tools for developing protocols for the efficient management of private companies, government agencies, and non-profit organizations.

In today's global marketplace, organizations need to be efficient to survive. The Operations Research program will provide formal training in methods of

optimization, modeling, and statistics used in operations research. The objective of this program is to help individuals assist organizations to make efficient use of their resources so as to maximize efficiency and minimize cost. Graduates of this program may be able to advance in management and organizational planning positions within their current employment or obtain new employment. It is recommended that applicants to the program hold a bachelor's degree in mathematics, engineering, or computer science.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/operations.html. For academic questions, prospective students may contact Professor Alan Tucker, Coordinator of Operations Research in the Department of Applied Mathematics and Statistics, at (631) 632-8365.

Advanced Graduate Certificate (AGC) in Waste Management

The School of Professional Development, in collaboration with Stony Brook's Waste Reduction and Management Institute (part of the Marine Sciences Research Center) offers an 18-credit Advanced Graduate Certificate in Waste Management.

This certificate program qualifies individuals to confront the complex and controversial problems of waste management and disposal by providing them with the educational background for making informed decisions on these matters.

This certificate should appeal to those who consider access to the most current expertise in waste management essential to working effectively in their professional careers or public service activities. It is designed to meet the immediate demands for waste management solutions and the more long-range goal of promoting the environmental and economic welfare of the New York region.

For complete admission and program requirements, visit SPD on the Web at www.stonybrook.edu/spd/graduate/wastemgmt.html. For academic questions, prospective students can also contact Larry Swanson at the Waste Reduction and Management Institute at (631) 632-8704.

Psychology (PSY)

Chairperson: Nancy K. Squires, Psychology B 154 (631) 632-7808

Graduate Program Director: Arthur Samuel, Psychology B 152 (631) 632-7855

Graduate Program Coordinator: Marilyn Wollmuth, Psychology B 150 (631) 632-7855

Web site: www.psychology.sunysb.edu

Degrees awarded: Ph.D. in Biopsychology; Ph.D. in Clinical Psychology; Ph.D. in Cognitive/Experimental Psychology; Ph.D. in Social and Health Psychology

The Department of Psychology, in the College of Arts and Sciences, is one of Stony Brook's largest graduate departments. More than 800 Ph.D. degrees have been awarded since the program began more than 40 years ago. In recent years the population of students has been about 60 percent women, 15 percent students from underrepresented groups, and 10 percent international students.

The Department is administratively organized into four program areas: Biopsychology, Clinical Psychology, Cognitive/Experimental Psychology, and Social and Health Psychology. Students must be admitted to one of these four program areas, but they are encouraged to receive training in more than one program area if appropriate. In conjunction with the Department of Neurobiology and Behavior, Brookhaven National Laboratory, and the Department of Psychiatry, interdisciplinary training is offered in behavioral neuroscience. In conjunction with the Departments of Linguistics and Computer Science, interdisciplinary training is offered in cognitive science. Course offerings and research training are structured in such a way that students can meet the requirements for a Ph.D. degree in Biopsychology, Clinical Psychology, Cognitive/Experimental Psychology, or Social and Health Psychology. Stony Brook's doctoral program in clinical psychology is registered for licensure in psychology with the New York State Education Department and approved by the American Psychological Association.

A detailed description of the graduate program, including requirements for students in each area of graduate studies, is available from the departmental graduate office or at www.psychology.sunysb.edu.

In all four program areas, the primary emphasis is on research training through apprenticeship, advisement, and independent research. New students are encouraged to become involved immediately in ongoing research and to engage

in independent research when sufficient skills and knowledge permit, with the goal of becoming active and original contributors. By the end of the first year at the latest, a student should make arrangements for a selected faculty member to serve as research advisor; this need not be the student's initially assigned advisor and may be a faculty member outside the student's area of studies.

Facilities

Faculty in each area maintain active laboratories with state-of-the-art equipment for research and graduate training. Clinical facilities include the Psychological Center, a training, research, and service unit that provides psychological services and consultation to the community and is also a site for graduate practicum and internships. The Department-sponsored University Preschool enrolls children from 18 months to five years of age, permitting both research and observation. The University Marital Therapy Clinic provides therapy for couples and individuals in the community who are experiencing relationship difficulties. The Autism Help Center is a private local agency that deals with school and family issues for children with autism and related developmental disabilities. The Developmental Disabilities Institute, another local agency, also offers services for people with a variety of disabilities. Affiliations have been established with the University's Health Sciences Center, local public schools, an agency for the mentally retarded, and a nearby VA hospital. The research interests of the core faculty center on depressive disorders, discord and aggression among couples, romantic competence among adolescents and adults, social problem solving, prevention and treatment of children's conduct problems and dysfunctional parental discipline, psychotherapy process and outcome, lesbian/gay/bisexual issues, autism, and literacy enhancement.

The Biopsychology area has its own facilities for human electrophysiology (ERPs), transcranial magnetic stimulation, anatomical and histochemical analyses, image analysis, animal housing, surgery, and animal behavioral testing. The Biopsychology labs also have access to a neuron tracing system and electron microscopy. The Psychology Department has access to neuroimaging facilities at nearby Brookhaven National Laboratory and at Stony Brook University Hospital.

The Cognitive/Experimental area offers training in cognitive science in its affiliations with the Departments of Linguistics and Computer Science, and in cognitive neuroscience, in cooperation with the Biopsychology Program, the Department of Neurobiology and Behavior, and Brookhaven National Laboratory's Medical Department. The Language, Mind, and Brain Initiative regularly sponsors interdisciplinary seminars with participation from Psychology, Linguistics, Computer Science, Philosophy, and Biology. Laboratory facilities include a Purkinje eyetracker and several lightweight head-mounted eyetrackers for psycholinguistics and visual cognition studies, rooms equipped to study electronic communication and human-computer interaction, sound-isolated chambers for perception and psycholinguistics experiments, multimedia workstations for presenting stimuli and collecting data, and computer-controlled choice stations for testing human and non-human subjects. Faculty research is particularly strong in language, memory, attention, visual cognition, and decision making. Most research programs are funded by agencies such as the National Science Foundation, the National Institutes of Health, and the Army Research Office. Faculty, students, and postdoctoral associates rely primarily on the Psychology Department's large volunteer pool of human subjects.

The Social and Health area faculty

have affiliations with the Department of Psychiatry and Behavioral Science, and they collaborate with researchers and clinicians in a variety of departments at the Stony Brook School of Medicine and University Hospital. Social and Health facilities include laboratories for studies of attachment, pregnancy and birth, close relationships, stress and coping, social/cognitive development, prejudice, social cognition, volunteerism, tobacco dependence, meta-analysis, and medical decision-making.

Admission

The requirements for admission to doctoral study, in addition to the minimum Graduate School requirements, ordinarily include:

A. A bachelor's degree with a major in psychology, or in a program providing adequate preparation for the intended area of study (ordinarily including statistics, research methodology, and/or psychology laboratory);

B. An average of 3.5 or better in academic undergraduate coursework;

C. One official copy of all previous college transcripts, with certified English translations of any transcripts in a foreign language;

D. Letters of recommendation from three instructors or academic advisors, and, for applicants to Clinical Psychology, three supplementary recommendations;

E. The Graduate Record Examination (GRE) General Test, with the GRE Advanced Test in Psychology recommended for undergraduate psychology majors);

F. For international students, TOEFL or ALIGU scores (unless their native language is English or they attended college where English was the language of instruction) and the International Student Financial Affidavit;

G. Students who do not meet these requirements may also apply if they feel that special circumstances should be considered;

H. Acceptance by the department and Graduate School.

The deadline for receipt of applications and all supporting materials for fall admission is January 15. Applications must be submitted online. Links to the online application system

are on the department Web site at www.psychology.sunysb.edu.

Faculty

Distinguished Professors

Goldfried, Marvin, Ph.D., 1961, University at Buffalo: Lesbian, gay, and bisexual issues; psychotherapy process research; cognitive behavior therapy; delineation of common therapeutic principles across theoretical orientations.

O'Leary, K. Daniel, *Director of Clinical Training*. Ph.D., 1967, University of Illinois: Etiology and treatment of marital discord and spouse abuse; physical aggression in intimate relationships; the effects of marital discord on partner depression; memory for interpersonal events.

Rachlin, Howard, *Emeritus*. Ph.D., 1965, Harvard University: Choice, decision making, behavioral economics, self-control, addiction, gambling, and time allocation in humans and other animals.

Professors

Aron, Arthur, Ph.D., 1970, University of Toronto, Canada: Motivation and cognition in close relationships; intergroup relations; social neuroscience.

Brener, Jasper, *Emeritus*. Ph.D., 1964, University of London, England: Cardiovascular psychophysiology; behavioral energetics; autonomic learning.

Carr, Edward G., Ph.D., 1973, University of California, San Diego: Autism; developmental disabilities; applied behavior analysis; positive behavior support with families and schools.

D'Zurilla, Thomas J., Ph.D., 1964, University of Illinois: Social problem solving; problem-solving therapy; prevention problem-solving training.

Emmerich, David S., *Emeritus*. Ph.D., 1967, Indiana University: Sensory psychology and perception including studies of psychoacoustics, reaction time, laterality differences, signal detection theory, and generally how we perceive the world.

Friend, Ronald, Ph.D., *Emeritus*. 1969, University of Toronto, Canada: Interpersonal processes; health psychology; social support and health; compliance with medical regimen; adjustment to chronic illness; promoting healthy behaviors.

Gerrig, Richard, Ph.D., 1984, Stanford University: Psycholinguistics; text understanding and representation; nonconventional language; cognitive experiences of narrative worlds.

Katkin, Edward S., *Emeritus*. Ph.D., 1963, Duke University: Individual differences in autonomic response to stress; stress, coping, and disease; psychophysiological predictors of risk for coronary disease; peripheral theories of emotion.

Klein, Daniel N., Ph.D., 1983, University at Buffalo: Psychopathology; mood disorders; assessment, classification, course, development, familial transmission, and treatment of

depression; child temperament and personality development.

Levine, Marvin, *Emeritus*. Ph.D., 1959, University of Wisconsin: Problem solving, especially heuristics, and the use of spatial information; comparison of Buddhist and Western views of human nature.

Neale, John, *Emeritus*. Ph.D., 1969, Vanderbilt University: Research on schizophrenia and life stress; immune system functioning and health.

O'Leary, Susan G., Ph.D., 1972, Stony Brook University: Theoretical and applied research on discipline practices in the home; prevention and early intervention vis-a-vis oppositional and conduct-disordered children.

Rajaram, Suparna, Ph.D., 1991, Rice University: Human memory and amnesia; implicit and explicit memory distinctions; new learning in amnesia; priming, social influences on individual memory; experimental investigation of remembering and knowing the past.

Samuel, Arthur, *Graduate Program Director*. Ph.D., 1979, University of California, San Diego: Perception, psycholinguistics, and attention; perception of speech as a domain of study in cognitive psychology; spatial and temporal properties of visual attention.

Squires, Nancy K., *Chairperson*. Ph.D., 1972, University of California, San Diego: Neuropsychology; neurophysiological measures of sensory and cognitive functions of the human brain, both in normal and clinical populations.

Waters, Everett, Ph.D., 1977, University of Minnesota: Social and personality development; parent-child and adult-adult attachment relationships.

Waters, Harriet Salatas, Ph.D., 1976, University of Minnesota: Cognitive development (comprehension and production of prose; memory and problem solving) and social cognition (mental representations of early social experience, co-construction and socialization processes).

Whitaker-Azmitia, Patricia, *Undergraduate Program Director*. Ph.D., 1979, University of Toronto: Animal models of autism and Down syndrome; serotonin and its role in brain development.

Whitehurst, Grover J., Ph.D., 1970, University of Illinois: Language disorders; emergent literacy; early interventions to enhance child development and reduce the effects of poverty.

Wortman, Camille, *Head, Social and Health Area*. Ph.D., 1972, Duke University: Reactions to stressful life experiences; the role of social support and coping strategies in ameliorating the impact of life stress; predictors of good psychological adjustment among those who experience major losses, including bereavement and serious injury; others' reactions to those who experience life crisis.

Wortman, Paul, *Emeritus*. Ph.D., 1967, Carnegie-Mellon University: Program evaluation, research synthesis, and meta-analysis of health interventions.

Associate Professors

Anderson, Brenda J., *Head, Biopsychology*. Ph.D., 1993, University of Illinois: Rodent models of the effects of exercise and stress on brain structure, metabolism, and function.

Brennan, Susan E., Ph.D., 1990, Stanford University: Language production and comprehension; speech disfluencies; human/computer interaction; computational linguistics; eye gaze as a measure of language processing and as a cue in conversation.

Cross, David V., *Emeritus*. Ph.D., 1965, University of Michigan: Psychological scaling and psychophysics; measurement theory; mathematical models in psychology; multivariate statistical techniques; causal modeling.

Davila, Joanne, Ph.D., 1993, University of California, Los Angeles: Interpersonal functioning and psychopathology; depression; maladaptive personality styles; close relationships; attachment processes.

Franklin, Nancy, *Head, Cognitive/Experimental Area*. Ph.D., 1989, Stanford University: Human memory; source monitoring; spatial cognition; mental models.

Lobel, Marci, Ph.D., 1989, University of California, Los Angeles: Stress, coping, and physical health; psychosocial factors in women's reproductive health; social comparison processes.

Robinson, John, Ph.D., 1991, University of New Hampshire: Behavioral neuroscience.

Zelinsky, Gregory, Ph.D., 1994, Brown University: Attention and eye movements during visual search and visual working memory tasks.

Assistant Professors

Canli, Turhan, Ph.D., 1993, Yale University: Genetic and neural basis of personality and emotion.

Freitas, Antonio L., Ph.D., 2002, Yale University: Social cognition; motivation; self-regulation.

Klonsky, E. David, Ph.D., 2005, University of Virginia: Self-injurious behaviors; borderline personality disorder; emotion and psychopathology; measurement of personality and psychopathology.

Leung, Hoi-Chung, Ph.D., 1997, Northwestern University: Prefrontal and parietal function in human cognition; neural mechanisms underlying spatial information processing and eye movement control; fMRI applications in cognitive neuroscience.

Levy, Sheri, Ph.D., 1998, Columbia University: Ideologies and lay theories; intergroup relations; prejudice reduction; volunteerism.

Moyer, Anne, Ph.D., 1995, Yale University: Psychosocial issues surrounding cancer risk; research synthesis and research methodology.

Westmaas, Lee, Ph.D., 1996, University of California, Irvine: Interaction of personality with

interpersonal, cognitive, and social factors in predicting successful adjustment to stressful experiences (such as traumatic life events or abstaining from addictive substances); gender differences in the provision and receipt of social support and their implications for health.

Lecturer

Kuchner, Joan, Ph.D., 1981, University of Chicago: Child and family studies; child development; social policy, children's environments.

Research Faculty

Grackin, Janice A., *Assistant Professor*. Ph.D., 1999, Stony Brook University: Equity in science, technology, engineering, and math education; stress and coping related to gender and race variables; assessment.

Heyman, Richard, *Professor*. Ph.D., 1992, University of Oregon: Escalation and de-escalation of family conflict; observation of couples; defining and assessing family maltreatment; innovative approaches to prevalence estimation of secretive problems (family maltreatment, substance abuse, suicidality); community-based prevention of secretive problems; clinical assessment and treatment of relationship dissatisfaction and partner abuse.

Slep, Amy Smith, *Associate Professor*. Ph.D., 1995, Stony Brook University: Affect regulation in parent-child and marital dyads; etiology of parental and partner aggression/abuse; connections between parenting and marital functioning.

Vivian, Dina, *Associate Professor*. Ph.D., 1986, Stony Brook University: Marital therapy; communication skills in maritally discordant couples; communication and problem solving in physically abusive couples; cognitive and affective processes in physically abusive and maritally discordant couples.

Joint and Associated Faculty

Biegon, Anat, *Senior Scientist, Medical Department, Brookhaven National Laboratory*. Ph.D., 1980, Weizmann Institute of Science, Israel: Brain response to traumatic, ischemic, or inflammatory insults.

Crowell, Judith A., *Professor, Child and Adolescent Psychiatry*. M.D., 1978, University of Vermont: The attachment system across the life span; parent-child and adult-adult interactions.

Fischel, Janet, *Professor, Pediatrics*. Ph.D., 1978, Stony Brook University: Behavioral and developmental pediatrics; developmental language disorders and emergent literacy skills; psychological management of disorders of elimination.

Goldstein, Rita, Z., *Assistant Scientist*. Ph.D., 1999, University of Miami: Neuroimaging (fMRI, PET, ERP); neuropsychology (reward processing/salience attribution, inhibitory control, and extinction); drug addiction (comorbidity with depression, PTSD, aggression, anger).

Kritzer, Mary, *Associate Professor, Neurobiology and Behavior*. Ph.D., Yale University, 1989: Gonadal hormone influence over function and dysfunction in the cerebral cortex.

Krupp, Lauren, *Associate Professor, Neurology*. M.D., 1981, Albert Einstein College of Medicine: Neuropsychological and neurobehavioral characteristics of chronic mental illness; interrelationship between memory performance and mood disturbance in chronic fatigue syndrome, Lyme disease, and multiple sclerosis.

Maczaj, Marta, M.D., 1989, Stony Brook University: Director, Sleep Disorders Center, University Hospital.

Morin, Lawrence P., *Professor, Psychiatry*. Ph.D., 1974, Rutgers University, Institute of Animal Behavior: Biological rhythms; environment and reproduction; endocrine system and behavior.

Sprafkin, Joyce, *Associate Professor, Psychiatry*. Ph.D., 1975, Stony Brook University: Child psychopathology; ADHD; tic disorders; effects of television on child behavior.

Stent, Amanda J., *Assistant Professor, Computer Science-Cognitive/Experimental*. Ph.D., 2001, University of Rochester: Spoken and multimodal dialogue systems; natural language generation; theories of discourse; information extraction.

Stone, Arthur, *Professor, Psychiatry*. Ph.D., 1978, Stony Brook University: Stress, coping, and illness; immune system functioning and health. Thanos, Peter, *Staff Scientist, Laboratory for Neuroimaging, Brookhaven National Lab*. Ph.D., Eastern Virginia Medical School, 1997: Addiction, including alcohol, drug abuse, and obesity.

Adjunct Faculty

Burkhard, Barbara, *Assistant Professor and Director, Child Treatment Program, North Suffolk Center*. Ph.D., 1976, Stony Brook University: Child abuse and neglect.

Peterson, Anne, *Professor and Associate Director, University Counseling Center*. Ph.D., 1980, Ohio University: Psychopathology, assessment, psychodynamic psychotherapy, women's issues, couple's therapy, and multicultural issues.

Sternglanz, Sarah, *Assistant Professor; Social Sciences Interdisciplinary Program*. Ph.D., 1973, Stanford University: Human ethology; sex roles; social learning theory; female academic and career success.

Degree Requirements

The receipt of the Ph.D. signifies both a scholarly mastery of the field of psychology and the ability to conduct independent research. In addition to the Graduate School's degree requirements, students must satisfy the following requirements (as well as requirements of their area of studies):

A. Course Requirements

A student must maintain a graduate G.P.A. of at least 3.0 and successfully complete an approved program of study with a grade of at least B in each

required course. Two semesters of quantitative methods and three core courses selected outside the student's area of graduate studies are required. In addition, two semesters of First-Year Lectures (no credit) and two semesters of a practicum in statistical computer applications are required. The four training areas of the department have additional course requirements. Following admission, students with graduate training elsewhere can petition to satisfy course requirements on the basis of their previous graduate work. No more than three departmental course requirements will be waived. Petition to waive requirements or to satisfy them on the basis of previous graduate work should be directed to the Graduate Office. Petitions concerning area requirements should be addressed to the student's area head.

B. Yearly Evaluation

The progress of each graduate student is reviewed at the end of each academic year by the student's area's faculty. This provides opportunities for both positive feedback about the student's achievements and constructive feedback for improving or accelerating the student's progress. We expect that all students admitted to the Ph.D. program have the potential to succeed; however, any student whose performance is below the standards established by the department and the area may be dismissed or asked to withdraw. Under certain circumstances a student may be permitted to obtain a terminal Master of Arts degree after passing the general examination at the M.A. level, satisfactorily completing the required courses and 30 graduate credit hours of study, and writing a second-year research paper.

C. Second-Year Paper

At the end of the second year of study, each student must submit an original research paper to the advisor and the area head. Although the form of this paper and the date it is due varies by area, all second-year papers must include data collection and analysis. The second-year paper must be approved prior to the specialties paper (see item E).

D. M.A. Degree in the Course of Doctoral Studies

The department will recommend granting an M.A. degree to students who have successfully completed the second-year requirements, including the second-year research paper, upon the recommendation of the faculty in the student's area of

graduate studies. This process is not automatic; students wishing to obtain an M.A. degree must file for one.

E. Specialties Paper and Examination

This requirement should be completed by the end of the sixth semester of study. The specialties paper is a review/research paper suitable for submission to a refereed journal. The paper must be presented to and defended before a committee. The form of the specialties paper depends upon the student's area of graduate studies, but all areas require its completion by the end of the third year in order for a student to be considered to be on track.

F. Advancement to Candidacy

After successful completion of the specialties paper and examination, all required coursework, and the requirements of the student's area of studies, a majority vote of the faculty of the student's area is required to recommend advancement to candidacy for the Ph.D. The Graduate School requires that students must advance to candidacy at least one year before defending their dissertations.

G. Research and Teaching

All four graduate training areas focus heavily on research; research activity from the time of admission through the fourth year is required. Students who are funded on state lines serve as teaching assistants (TAs) for classes taught by departmental faculty and instructors.

For all students, regardless of source of funding, two semesters of substantial direct instruction (SDI) in the classroom or laboratory is required (one of which must be PSY 310). Students may satisfy this requirement by providing significant hours of lecturing and student contact in a class for which they are serving as a TA, or by serving as the instructor of record for a class of their own. During these semesters, graduate students must receive teaching evaluations from their students.

H. Residence

Minimum residence of two years and the equivalent of three years of full-time graduate study are ordinarily required. Unless admitted as part-time students (which happens rarely), residents must register for full-time study until they are advanced to candidacy. Full-time study is at least 12 credits during the first year and nine thereafter.

I. Dissertation

The approval of the dissertation proposal and successful oral defense of the completed dissertation are required.

Within Area Course Requirements

In addition to satisfying Graduate School and departmental degree requirements, students must satisfy all of the course requirements of their training programs.

Biopsychology

Complete the following courses (required of all Biopsychology area students):

PSY 561 Cognitive and Behavioral Neuroscience I
PSY 562 Cognitive and Behavioral Neuroscience II

Complete at least two of the following courses:

PSY 560 Neuropsychology
PSY 564 Neuropsychopharmacology
PSY 620 Affective Neuroscience (Selected Topics)
PSY 620 Cognitive Neuroscience (Selected Topics)

Sign up for the following sequence each year (required of all Biopsychology area students):

PSY 581 Cognitive and Behavioral Neuroscience Colloquium I
PSY 582 Cognitive and Behavioral Neuroscience Colloquium II

Clinical Psychology

Complete the following courses in the first year (required of all Clinical area students):

PSY 534 Behavioral Assessment
PSY 537 Methods of Intervention: Child and Adolescent
PSY 538 Methods of Intervention: Adult
PSY 545 or PSY 596 Psychopathology or Deviant Development (take one in first or second year)
PSY 602 Assessment Practicum
PSY 603 Ethics and Professional Issues

Complete the following courses in the second year (required of all Clinical area students)

PSY 533 Principles of Therapeutic Intervention
PSY 535 Advanced Research Methods
PSY 604 Intervention Practicum

PSY 605 Advanced Intervention
Practicum
PSY 606 Supervised Practice

Complete the following courses in the third year

PSY 606 Supervised Practice (fall and spring)
PSY Psychopathology or Core Course
PSY Core Course or Elective
PSY Elective
PSY Elective
PSY 698 Research (fall and spring)

Complete dissertation (PSY 699) during the fourth year and complete internship (PSY 608) in the fifth year.

Experimental: Cognitive Science Track

Complete three of the following:

PSY 513 Attention and Thought
PSY 514 Sensation and Perception
PSY 518 Memory
PSY 520 Psycholinguistics
PSY 610 Special Topic Seminar in Cognition

Experimental: Judgment and Choice Track

Complete three of the following:

PSY 511 Learning
PSY 513 Attention and Thought
PSY 514 Sensation and Perception
PSY 518 Memory
PSY 520 Psycholinguistics
PSY 560 Neuropsychology
PSY 561 Cognitive and Behavioral Neuroscience I
PSY 562 Cognitive and Behavioral Neuroscience II
PSY 564 Neuropsychopharmacology

Sign up for the following sequence each year (required of all students in the Cognitive or Judgment and Choice Tracks):

PSY 583 Experimental Colloquium I
PSY 584 Experimental Colloquium II

The Cognitive/Experimental Area also requires submission of a First-Year Research Paper requiring data collection and analysis. This paper must be submitted to the advisor and area head at the end of the second semester of graduate study.

Social and Health Psychology

Complete two of the following courses:

PSY 541 Close Relationships
PSY 542 Addictions
PSY 543 Attachment

PSY 544 Emotions
PSY 549 Prejudice
PSY 555 Social Psychology
PSY 558 Social Psychology: Health Applications
PSY 559 Psychology of Women's Health
Complete an additional special topics course in the Social and Health area (PSY 610 or PSY 620). Alternatively, students can complete an additional course from the preceded category.

Students must complete one of the quantitative courses listed or an additional methods or statistics course as approved by the student's advisor or area head. These quantitative courses count toward the Department's breadth requirement.

PSY 505 Structural Equation Modeling
PSY 506 Psychometrics
PSY 535 Advanced Research Methods
PSY 610 Meta-Analysis

Courses

PSY 501 Analysis of Variance and Experimental Design

The design and analysis of factorial experiments having a single dependent variable. Topics include between- and within-subjects designs, mixed-factor designs, interactions, trend analysis, planned comparisons, and analysis of covariance. Emphasis on applications in psychological research. Required of all Ph.D. students in psychology.

Prerequisite: Undergraduate statistics

Co-requisite: PSY 508

Fall, 3 credits, ABCF grading

PSY 502 Correlation and Regression

Correlation, regression, multiple correlation, multiple regression, partial correlation, and introductions to some of the following topics: factor analysis, canonical correlation, structural equation modeling, relation of regression to analysis of variance, and general linear model. Required of all Ph.D. students in psychology.

Co-requisite: PSY 508

Spring, 3 credits, ABCF grading

PSY 504 First-Year Lectures

Presentation and discussion of current research progress and interests. Required of all first-year Ph.D. students.

Fall and spring, S/U grading

PSY 505 Structural Equation Modeling and Advanced Multivariate Methods

Thorough coverage of structural equation modeling and brief coverage of other specialized techniques used in data analysis in psychology, such as multi-level modeling and cluster analysis (topics for brief coverage vary from year to year). The course emphasizes hands-on work with real data sets, using standard statistical software packages.

Spring, 3 credits, ABCF grading

PSY 506 Psychometric Methods

This course surveys traditional and evolving views on item design, reliability, and validity, reviews statistical methods related to test construction, and applies this material to the design and evaluation of observational, rating, and self report measures in domains of interest to psychologists. The course also examines the impact of test characteristics on data analysis and the role of test design in theory construction.

3 credits, ABCF grading

PSY 508 Introduction to Computer Applications in Statistics

Computer protocol and introduction to statistical packages and necessary utility programs.

Pre- or Co-requisite: PSY 501 or 502

Fall and spring, 0 - 1 credits, S/U grading

May be repeated for credit

PSY 509 Practicum in Computer Applications

Workshops and practical experience in computer applications. Provides computer access for courses that do not have their own accounts and for student projects to satisfy other degree requirements.

Prerequisite: Psychology doctoral student not advanced to candidacy; for Section 2 (statistical application), PSY 502 as a pre- or co-requisite

Fall or spring, alternate years, S/U grading

PSY 510 History of Psychology

Intensive reading in the history of psychology from original sources. Emphasis is on class discussion and relation to modern problems.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 511 Learning

A consideration of the basic principles of learning. Analysis of the leading theories of learning as well as areas of controversy and dispute.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 513 Attention and Thought

An advanced class in cognitive psychology considering the architecture and language of thought. Topics include attention, working memory, meaning, imagery, and the relationship between conscious and unconscious thinking.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 514 Sensation and Perception

An introduction to the phenomena of sensation and perception and the methods by which they may be studied. Different theoretical frameworks are also considered.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 518 Memory

Review of theory and phenomena related to human memory. Topics include representation of schemas and categories, encoding, forgetting, implicit learning, and memory for procedures. Several recent models of long-term memory representation are discussed and compared.

Fall or spring, alternate years, 3 credits,

ABCF grading

Degree Requirements

Requirements for the Ph.D. Degree

A. Course Requirements

Biochemistry and Molecular Biology Specialization

1. Molecular Genetics (MCB 503)
2. Graduate Biochemistry (MCB 520)
3. Membrane Biochemistry (MCB 517)
4. Cell Biology (MCB 656)
5. Physical Biochemistry (MCB 512)
6. One approved elective graduate course
7. Students in their first year rotate in four laboratories with the goal of selecting an environment for their thesis research
8. Participation in Journal Club (MCB 531/532); Student Seminars (MCB 603/604); Visiting Scientists Seminars (MCB 601/602)
9. Enrollment in the first year in Ethics (GRD 500)
10. Enrollment in the third semester in Computational Methods in Biochemistry and Structural Biology (BSB 515)

Cell and Developmental Biology Specialization

1. Molecular Genetics (MCB 503)
2. Graduate Biochemistry (MCB 520)
3. Membrane Biochemistry (MCB 517)
4. Cell Biology (MCB 656)
5. Developmental Biology (MCB 657)
6. One approved elective graduate course
7. Students in their first year rotate in four laboratories with the goal of selecting an environment for their thesis research
8. Participation in Journal Club (MCB 531/532); Student Seminars (MCB 603/604); Visiting Scientists Seminars (MCB 601/602)
9. Enrollment in the first year in Ethics (GRD 500)
10. Enrollment in the third semester in Computational Methods in Biochemistry and Structural Biology (BSB 515)

Immunology and Pathology Specialization

1. Molecular Genetics (MCB 503)

2. Graduate Biochemistry (MCB 520)
3. Membrane Biochemistry (MCB 517)
4. Cell Biology (MCB 656)
5. General Pathology (HBP 531)
6. Immunology (HBP 533)
7. Students in their first year rotate in four laboratories with the goal of selecting an environment for their thesis research.
8. Participation in Journal Club (HBP 590); Student Seminars (MCB 603/604); Visiting Scientists Seminars (MCB 601/602)
9. Enrollment in the first year in Ethics (GRD 500)
10. Enrollment in the third semester in Computational Methods in Biochemistry and Structural Biology (BSB 515)

Students must achieve a B or better in all required courses and must maintain a B average in elective courses.

B. Qualifying Examination

At the beginning of the fourth semester, the student must pass a written qualifying examination.

C. Research Proposal

Following successful completion of the qualifying examination, the student writes a research proposal based on the probable area of the student's Ph.D. dissertation. The proposal is defended orally to a faculty examination committee that does not include the student's research advisor. The proposal examination normally takes place by the end of the fifth semester. After passing the proposal examination, the faculty committee and Ph.D. research advisor usually become the student's Ph.D. thesis committee and meet with the student at least once a year to follow his or her thesis progress.

D. Teaching Experience

All students are required to gain experience in teaching by assisting in laboratory sections, leading discussion sections, or helping to formulate and grade examination papers. The teaching experience may be in either undergraduate or graduate courses, and extends over a period of two semesters.

E. Advancement to Candidacy

When the above requirements

have been satisfactorily completed, a recommendation for advancement to candidacy for the Ph.D. will be forwarded to the Graduate School.

F. Ph.D. Dissertation

During the second year, the student initiates a dissertation research project in the laboratory of a particular member of the program faculty. After the student has passed the proposition examination, a research committee is appointed to guide the dissertation research, and when the research nears completion, a dissertation examining committee is approved by the dean of the Graduate School.

G. Dissertation Defense

The dissertation defense, which completes the requirements for the Ph.D., consists of a public seminar presentation of the dissertation work followed by an oral examination before the dissertation examining committee.

H. Residence Requirement

The University requires at least two consecutive semesters of full-time graduate study. The demands of the course of study necessitate a longer period of residence.

Courses

MCB 500 Directed Readings in Molecular and Cellular Biology

Directed readings in topics of current interest, under supervision of a faculty sponsor.

Prerequisite: Matriculation in graduate program or permission of instructor
Fall and spring, 1-3 credits, ABCF grading
May be repeated for credit

MCB 503 Molecular Genetics

Introduces the classical work and current developments in lower and higher genetic systems. Covers gene structure and regulation in prokaryotic and eukaryotic organisms, mutational analysis and mapping, transposable elements, and biological DNA transfer mechanisms. Bacteriophage as well as lower and higher eukaryotic systems are used to illustrate aspects of molecular genetic structure and function. This course is offered as both MCB 503 and HBM 503.

Fall, 3 credits, ABCF grading

MCB 506 Topics in Molecular and Cellular Biology

Seminar course discusses recent literature in molecular and cellular biology. Students are required to present and discuss recent research publications in selected topics.

Prerequisite: Matriculation in graduate program or permission of instructor
Spring, 2 credits, ABCF grading

MCB 509 Experimental Molecular and Cellular Biology

An introduction to modern biochemical research techniques. The student spends a half term in the laboratory of each of four different members of the staff selected in consultation with the course director. In each laboratory the student participates in some aspect of the ongoing research pursued by the faculty member.

Prerequisite: Matriculation in graduate program or permission of instructor
Fall, 1-4 credits, ABCF grading

MCB 510 Experimental Molecular and Cellular Biology

An introduction to modern biochemical research techniques. The student spends a half term in the laboratory of each of four different members of the staff selected in consultation with the course director. In each laboratory the student participates in some aspect of the ongoing research pursued by the faculty member.

Prerequisite: Matriculation in graduate program or permission of instructor
Spring, 1-4 credits, ABCF grading

MCB 512 Physical Biochemistry

Theoretical principles and experimental methods used in the study of proteins and nucleic acids, e.g., spectroscopy, magnetic resonance and diffraction.

Fall, 2 credits, ABCF grading

MCB 517 Membrane Biochemistry

Examines the molecular architecture of membranes; the structure, organization, functions, and assembly of lipids and proteins in biological membranes. This course is also offered as BSB 517.

Fall, 1 credit, ABCF grading
May be repeated for credit

MCB 520 Graduate Biochemistry I

Several topics in modern biochemistry are treated at an advanced level. Topics covered will include protein structure, enzyme kinetics and mechanisms, and enzyme regulation.

Fall, 3 credits, ABCF grading

MCB 529 Organelle Development

This course is concerned primarily with the development of the mitochondrion and the chloroplast. Subjects will include the biogenesis of these organelles and their relation to the interaction with the nucleus. Emphasis will be on genetic and biochemical analysis.

Prerequisite: Matriculation in graduate program or permission of instructor
Fall, alternate years, 3 credits, ABCF grading

MCB 531 Graduate Seminar in Molecular and Cellular Biology

Seminars are given by graduate students on current literature in the fields of biochemistry, molecular biology, cell biology or developmental biology.

Prerequisite: matriculation in graduate program or permission of instructor
1 credit, ABCF grading

MCB 532 Graduate Seminar in Molecular and Cellular Biology

Seminars are given by graduate students

on current literature in the fields of biochemistry, molecular biology, cell biology, or developmental biology.

Prerequisite: Matriculation in graduate program or permission of instructor
Spring, 1 credit, ABCF grading

MCB 580 Teaching Honors

Selected students whose performance in the basic required courses for the graduate program is in the top 25 percent conduct tutorials for first-year graduate students in the program and other students taking graduate courses for credit. The tutors are supervised and graded by faculty of the graduate program. Successful completion of this course makes students eligible to receive "Honors in Teaching" on their transcripts.

Prerequisite: Matriculation in graduate program or permission of instructor
Fall and spring, 1 credit, S/U grading

MCB 599 Dissertation Research

Original investigation under the supervision of a member of the staff.

Prerequisite: Matriculation in graduate program or permission of instructor
Fall and spring, 1-12 credits, S/U grading
May be repeated for credit

MCB 601 Colloquium in Molecular and Cellular Biology

A weekly series of talks and discussions by visiting scientists covering current research and thinking in various aspects of molecular and cellular biology. Required for all MCB graduate students. Attendance is mandatory. Visitors welcome.

Prerequisite: Matriculation in graduate program or permission of instructor
Fall, 1 credit, S/U grading

MCB 602 Colloquium in Molecular and Cellular Biology

A weekly series of talks and discussions by visiting scientists covering current research and thinking in various aspects of molecular and cellular biology. Required for all MCB graduate students. Attendance is mandatory. Visitors welcome.

Prerequisite: Matriculation in graduate program or permission of instructor
Spring, 1 credit, S/U grading

MCB 603 Student Seminar in Molecular and Cellular Biology

Seminars given by graduate students on the progress of their own thesis research. Required of all students every term in which they are registered in Graduate Studies in Molecular Biology and Biochemistry. Attendance is mandatory. Visitors welcome.

Prerequisite: Matriculation in graduate program or permission of instructor
Fall and spring, 1 credit, S/U grading
May be repeated twice for credit

MCB 604 Student Seminar in Molecular and Cellular Biology

Seminars given by graduate students on the progress of their own thesis research. Required of all students every term in which they are registered in Graduate Studies in Molecular Biology and Biochemistry. Attendance is mandatory. Visitors welcome.

Prerequisite: Matriculation in graduate program or permission of instructor
Fall and spring, 1 credit, S/U grading
May be repeated twice for credit

MCB 656 Cell Biology

Introduction to the structural and functional organization of cells and tissues and to the way structure relates to function. Particular emphasis is placed on nuclear and chromosomal structure, signal transduction, protein translocation, the cytoskeleton and the extracellular matrix. The interaction of cellular structures and components and their regulation is stressed as is the organization and interaction of cells in tissues. The course is comparative and includes examples of cells and tissues from vertebrates, invertebrates, plants, and prokaryotic systems.

Prerequisite: Matriculation in graduate program or permission of instructor
Spring, 4 credits, ABCF grading

MCB 657 Principles of Development

This course deals with developing systems at all levels from the morphological to the molecular. Illustrative material from both animal and plant kingdoms is used. Special attention is given to gametogenesis, genetic control of early development, transcriptional and translational control of protein synthesis, the role of cell division and cell movements, and cell-to-cell interactions in defining developing systems.

Fall, 3 credits, ABCF grading

MCB 688 Advanced Seminars

Topics to be arranged. Visitors are welcome.

Prerequisite: Matriculation in graduate program or permission of instructor
1 credit, S/U grading
May be repeated for credit

MCB 699 Dissertation Research on Campus

Prerequisites: Must be advanced to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab; matriculation in graduate program or permission of instructor
Fall, spring, and summer, 1-12 credits, S/U grading
May be repeated for credit

MCB 700 Dissertation Research off Campus—Domestic

Prerequisites: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor; matriculation in graduate program or permission of instructor
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

MCB 701 Dissertation Research off Campus—International

Prerequisites: Must be advanced to candidacy

(G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor; matriculation in graduate program or permission of instructor
Fall, spring, and summer, 1-9 credits, S/U grading

MCB 800 Summer Research

Prerequisite: Matriculation in graduate program or permission of instructor
S/U grading
May be repeated for credit

BSB 515 Computational Methods in Biochemistry and Structural Biology

Computational methods used in sequence searching and analysis, bioinformatics, graphical analysis of proteins, and nucleic acids.

Prerequisite: This class is restricted to first year BSB, HBM, and HBH Ph.D. students and second year MCB Ph.D. students; exceptions require approval from instructor
Fall, 1 credit, S/U grading

HBP 511 Pathobiology for Graduate Health Care Practitioners

For graduate students who have obtained primary health care baccalaureate degrees through the case study approach. Covers the underlying principles of modern experimental pathology. Focuses on the clinical aspects of the body system, including relevant underlying biochemistry, structure, or pathophysiology at the organ, tissue, cell or molecular level.

Prerequisite: Admission to graduate Health Sciences Center program
Fall and spring, 3 credits, ABCF grading

HBP 531 General Pathology

Introduces the nature and causes of disease, death, reaction to injury, and repair. Analyzes associated structural changes in cells and tissues, with reference to their functional correlates.

Prerequisites: Admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HBP 533 Immunology

Principles of immunology for graduate students in the biological sciences, including definition of antigens and antibodies, specificity of the immune response, immunoglobulin structure, the genetics of immunoglobulin synthesis, cellular cooperation in the immune response, hypersensitivity, tolerance immunogenetics. Open to advanced undergraduates.

Prerequisites: Advanced courses in biology and biochemistry and permission of instructor; admission to graduate Health Sciences Center program

Fall, 3 credits, ABCF grading

HBP 546 Human Diseases: Mechanisms in Therapy

Human disease will be studied at biochemical and molecular cell lines. Aspects of mechanism will be considered with particular attention to pathogenesis and therapeutic intervention.

Prerequisite: Admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HBP 554 Advanced Immunology

Selected topics in immunology are discussed using original research literature as the central focus. Students present and discuss the literature in a seminar format.

Prerequisite: Admission to graduate Health Sciences Center program
Spring, 2 credits, ABCF grading

HBP 556 Laboratory Medicine

A four-week, full-time (6 hours per day) course dealing with clinical laboratory decision making and the basis for the laboratory evaluation of human evaluation of human disease. Didactic and practical presentations by interdepartmental faculty. Intended principally for senior medical students, but also for advanced microbiology or biochemistry students interested in clinical applications.

Prerequisite: Admission to graduate Health Sciences Center program
Spring, 6 credits, ABCF grading

HBP 561 Electron Microscopy for Experimental Pathologists

Uses electron microscope (EM), alone and in conjunction with other methodologies in studies of biological dysfunction. Special techniques include histochemistry, enzyme histochemistry, immunohistochemistry, diffraction, stereo-EM, and scanning EM. Design of protocols, preparation and interpretation of data.

Prerequisite: Admission to graduate Health Sciences Center program
Fall and spring, 2-6 credits, ABCF grading

HBP 580 Teaching Honors

Selected students whose performance in the basic required courses for the graduate program is in the top 10 percent conduct tutorials for first-year graduate students in the program and other students taking graduate courses for credit. The tutors are supervised and graded by program faculty of the graduate program. Successful completion of this course will make the students eligible to receive an "Honors in Teaching" on their transcript.

Prerequisite: Admission to Graduate Health Sciences Center Program
Fall and Spring, 1 credit, ABCF grading

HBP 590 Seminars in Immunology

A series of monthly seminars focusing on research in progress by the participants, current journal articles in the field of immunobiology, and prepared reviews of specified areas in the general field.

Prerequisite: Admission to graduate Health Sciences Center program

Fall and spring, 1 credit, S/U grading

May be repeated once for credit

HBP 622 Clinical Pathologic Correlations:

Gross Pathology

Correlative exercises in clinical pathology and human gross anatomic pathology including surgical biopsy material. Open to students in medical sciences.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, 1-3 credits, ABCF grading
May be repeated for credit

Molecular Genetics and Microbiology (HBM)

Acting Chairperson: Jorge Benach, Centers for Molecular Medicine 248 (631) 632-4225

Graduate Program Director: Janet Hearing, Life Sciences Building 250B (631) 632-8778

Graduate Program Coordinator: Kathryn Bell, Life Sciences Building 130 (631) 632-8812

Degree awarded: Ph.D. in Molecular Genetics and Microbiology

Graduate study in Molecular Genetics and Microbiology offers a diversified course of study leading to the Ph.D. degree. The major areas of study are the basic mechanisms of viral and bacterial pathogenesis, cell growth, signal transduction, and the molecular mechanisms of cancer.

Studies are directed toward an understanding of cell biology, molecular genetics, and microbial pathogenesis and are designed to prepare a student to become an effective research scientist.

The student prepares for a program of study in consultation with an advisory committee composed of faculty members active in several research areas. A research advisor, selected by the student at the end of the first year of study, then joins the advisory committee. The individualized program aims to develop breadth of understanding in the basic disciplines through active participation in laboratory research, coursework, and seminars.

Facilities

The Department of Molecular Genetics and Microbiology occupies the second floor of the Life Sciences Building as well as space on the lower level, first and third floors of the Life Sciences Building and the second floor of the Centers for Molecular Medicine (CMM). Approximately 47,000 square feet of research space are available. Each research laboratory is fully equipped and, in addition, the Department provides access to a variety of communal central facilities and services. These include a cell culture and hybridoma facility, microinjection facility, glassware washing and sterilization facility, analytical equipment lab, deconvolution microscopy facility, environmental rooms, darkrooms, and fermentor facility. Major items of equipment are organized into these central facilities, which are readily available to trainees. The CMM, a new state-of-the-art research and teaching facility, serves as a physical and intellectual bridge between investigators in the adjacent Life Sciences Building and the nearby University Health Sciences Center. The

world-renowned research facilities at the Cold Spring Harbor and the Brookhaven National Laboratories are available to members of the Department. The Health Sciences Library and Barry S. Coller Learning Center, located in the Health Sciences Center, contains collections of biological and medical books and journals presently totaling 262,000 volumes, including more than 3,200 journal titles. In addition, the Health Sciences Library provides access to more than 2,300 full-text electronic journals. Other campus libraries include the Frank Melville Jr. Memorial Library.

Admission

Predocorral trainees are admitted to the Graduate School of Stony Brook University by application to the particular graduate program. In addition to the minimum Graduate School requirements, the following are taken into account:

A. Undergraduate performance in science courses and independent laboratory experiences;

B. Percentile on the Graduate Record Examination (GRE) General Test;

C. Letters of recommendation (3).

The program does not require, but prefers to see, evidence of research activity as an undergraduate. Whenever possible, prospective students are invited to Stony Brook for interviews with the program faculty.

All students who are accepted into the Molecular Genetics and Microbiology program are accepted with full support. The current level of support is \$24,000 per calendar year plus full tuition scholarship. Health insurance is provided for all students.

The final decision concerning admissions is made by the dean of the Graduate School, and the candidate is officially notified by letter from the dean's office.

Faculty

Professors

Bar-Sagi, Dafna. Ph.D., 1984, Stony Brook University: Role of *ras* oncogenes in cell proliferation; signal transduction.

Benach, Jorge, *Acting Chairperson*. Ph.D., 1971, Rutgers University: Pathogenesis of spirochetal infections and their host responses.

Bliska, James B., Ph.D., 1987, University of California, Berkeley: Molecular and cellular basis of bacterial-host interactions.

Carter, Carol A., Ph.D., 1972, Yale University: HIV and retroviral assembly and replication.

Delihias, Nicholas, Ph.D., 1961, Yale University: Structure, function, and evolution of small RNAs; control of gene expression by regulatory RNAs.

Furie, Martha¹, Ph.D., 1980, Rockefeller University: Interactions among endothelial cells, leukocytes, and pathogenic bacteria.

Futcher, Bruce, D.Phil., 1981, University of Oxford: Control of cell division in eukaryotic cells.

Hayman, Michael J., Ph.D., 1973, National Institute for Medical Research, England: Mechanism of transformation by retroviral oncogenes; erythroid differentiation.

Hearing, Patrick, Ph.D., 1980, Northwestern University: Viral molecular genetics; eukaryotic transcriptional regulation; gene therapy.

Katz, Eugene R., Ph.D., 1969, University of Cambridge, England: Developmental and genetic studies on *Dictyostelium discoideum*; the role of membrane sterols in cell growth and development.

Konopka, James B., Ph.D., 1985, University of California, Los Angeles: G-protein coupled receptor signal transduction; fungal pathogenesis (*Candida albicans*).

Marcu, Kenneth², Ph.D., 1975, Stony Brook University: Immunoglobulin gene expression and recombination; regulation and mechanisms of action of the inhibitor of NF-kB kinase (IKK) complex.

Reich, Nancy, Ph.D., 1983, Stony Brook University: Signaling switches in gene expression by hormones or viral infection.

Steigbigel, Roy³, M.D., 1966, University of Rochester School of Medicine: Treatment of HIV infection.

Wimmer, Eckard, Ph.D., 1962, University of Göttingen, Germany: The molecular biology of poliovirus replication and the molecular basis of picornaviral pathogenesis.

Associate Professors

Leatherwood, Janet, Ph.D., 1993, Johns Hopkins University: Cell cycle control of DNA replication.

Mackow, Erich R., Ph.D., 1984, Temple University: Rotavirus and hantavirus pathogenesis.

Paul, Aniko, Ph.D., 1966, Stanford University: Biochemical and genetic studies of poliovirus replication.

Thanassi, David, Ph.D., 1995, University of California, Berkeley: Secretion of virulence factors by bacterial pathogens; pilus biogenesis by uropathogenic *E. coli*.

Assistant Professors

Carpino, Nicholas A., Ph.D., 1997, Stony Brook University: Positive and negative regulation of T cell receptor signaling.

Chan, Edward⁴, M.D., 1997, State University of New York, Buffalo: Growth factor receptors and cancer.

Hearing, Janet C., Ph.D., 1984, Stony Brook University: Molecular analysis of Epstein-Barr virus latent cycle DNA replication.

Lee, Christopher⁵, M.D., University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School: Cancer vaccine development.

Patel, Kopal N.⁶, M.D., 1996, University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School: Genetic profiling in the progression of thyroid cancer.

Zong, Wei-Xing, Ph.D., 1999, University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School: Cell death in response to stress and chemotherapeutic agents.

Adjunct Faculty

Anderson, Carl W., *Geneticist*.⁷ Ph.D., 1970, Washington University: Cell cycle control and cellular response to DNA damage.

Dunn, John J., *Senior Microbiologist*.⁷ Ph.D., 1970, Rutgers University: Transcription, processing, and translation of RNA.

Hannon, Gregory, *Associate Professor*.⁸ Ph.D., 1992, Case Western Reserve University: Cellular proliferation control; double-stranded RNA-induced gene silencing.

Li, Huilin, *Biophysicist*.⁷ Ph.D., 1994, University of Sciences and Technology, China: Structural biology of macromolecular assemblies and membrane proteins by cryo-electron microscopy.

Steinberg, Bettie M., *Associate Professor*.⁹ Ph.D., 1976, Stony Brook University: Papilloma viruses; cell-virus interactions; viral transformation.

Stillman, Bruce W., *Professor*.⁸ Ph.D., 1979, Australian National University: Mechanism of eukaryotic DNA replication.

Tracey, Kevin J., *Professor*.⁹ M.D., 1983, Boston University School of Medicine: The cholinergic anti-inflammatory pathway.

Research Faculty

Bahou, Wadie, *Professor*.¹⁰ M.D., 1980, Massachusetts Medical Center: Human genetics; gene therapy.

Cutler, Christopher, *Associate Professor*.¹¹ D.D.S., Ph.D., 1986 and 1990, Emory University School of Medicine; periodontal disease.

Dean, Neta, *Associate Professor*.¹² Ph.D., 1988, University of California, Los Angeles: Protein trafficking in yeast.

Freimuth, Paul, *Associate Biochemist*.⁷ Ph.D., 1980, Stanford University: Adenovirus reproduction; virus-cellular receptor binding.

Joshua-Torr, Leemor, *Associate Professor*.⁸ Ph.D., 1991, The Weizmann Institute, Israel: Structural biology and molecular recognition.

Karzai, Wali, *Assistant Professor*.¹² Ph.D., 1995, Johns Hopkins University: Structure and function of RNA-binding proteins and biochemical studies of the SmpBsrA quality control system.

Kew, Richard, *Assistant Professor*.¹³ Ph.D., 1986, Stony Brook University: Leukocyte chemotaxis; inflammation; pulmonary immunopathology.

London, Erwin, *Professor*.¹² Ph.D., 1979, Cornell University: Membrane protein folding and lipid interaction.

Lowe, Scott, *Professor*.⁸ Ph.D., 1994, Massachusetts Institute of Technology: Apoptosis; anticancer therapy resistance.

Luft, Benjamin, *Professor*.¹⁰ M.D., 1976, Albert Einstein Medical College: Pathobiology of *Borellia* and *Toxoplasma*.

Miller, Todd, *Professor*.¹⁴ Ph.D., 1988, Rockefeller University: Signal transduction by tyrosine kinases.

Moll, Ute, *Professor*.¹³ M.D., 1985, University of Ulm: Tumor suppressor genes; role of p53 in human cancer.

Neiman, Aaron, *Assistant Professor*.¹² Ph.D., 1994, University of California, San Francisco: Vesicle trafficking and intracellular signaling in yeast.

Skowronski, Jacek, *Associate Professor*.⁸ Ph.D., 1981, Lodz University: HIV genes and signal transduction in T cells.

Spitzer, Eric, *Associate Professor*.¹⁰ M.D., Ph.D., 1985, Johns Hopkins University: Molecular biology of microbial pathogens.

Stenlund, Arne, *Associate Professor*.⁸ Ph.D., 1984, Uppsala University, Sweden: DNA replication of bovine papillomavirus.

Studier, F. William, *Professor*.⁷ Ph.D., 1963, Caltech: Genetics and physiology of bacteriophage T7; structural genomics.

Thomsen, Gerald, *Associate Professor*.¹² Ph.D., 1988, Rockefeller University: Embryonic induction in *Xenopus*.

Tonge, Peter J., *Assistant Professor*.¹⁵ Ph.D., 1986, University of Birmingham: Enzyme mechanisms and rational drug design.

Tonks, Nicholas, *Professor*.⁸ Ph.D., 1985, University of Dundee: Post-translational modification; phosphorylation and phosphatases.

Wigler, Michael, *Professor*.⁹ Ph.D., 1978, Columbia University: Signal transduction and growth control in eukaryotes.

Number of teaching, graduate, and research assistants, fall 2005: 37

1) Joint appointment, Department of Pathology

2) Joint appointment, Department of Biochemistry and Cell Biology

3) Joint appointment, Department of Medicine

4) Joint appointment, Department of Pediatrics

5) Joint appointment, Department of Urology

6) Joint appointment, Department of Surgery

7) Brookhaven National Laboratory

8) Cold Spring Harbor Laboratory

9) The Feinstein Institute for Medical Research

10) Department of Medicine

11) Department of Periodontics

12) Department of Biochemistry and Cell Biology

13) Department of Pathology

14) Department of Physiology and Biophysics

15) Department of Chemistry

Degree Requirements Requirements for the Ph.D. Degree in Molecular Genetics and Microbiology

The predoctoral training program offers its students the opportunity to study questions in virology, bacteriology, immunology, biochemistry, and cell and developmental biology utilizing the experimental approaches of the molecular biologist and geneticist. Instruction and course planning involve faculty members from the Department of Molecular Genetics and Microbiology and selected members from the Departments of Biochemistry and Cell Biology, Medicine, Pathology, Physiology and Biophysics, and Pharmacology, and from three outside institutions, Cold Spring Harbor Laboratory, Brookhaven National Laboratory, and North Shore-Long Island Jewish Medical Center. The general philosophy of the program is that a successful research career in the diverse and heterogeneous area of molecular biology requires a broadly based background, familiarity with at least all of the above areas, and a frame of mind that is receptive to new approaches.

The Department has an active seminar program of outside speakers who present topics relevant to molecular genetics and microbiology, and there is a yearly symposium in which ongoing research in the Department and recent progress in the field are presented and discussed. This symposium is held early in the fall in order to introduce new students to the faculty, to other students, and to the areas of ongoing research within the Department. The Department also presents a colloquium each fall on human diseases, with out-

standing researchers from throughout the world presenting their current work on the selected topic. Students in the program are encouraged to attend all of these programs as part of their training.

In addition to the minimum requirements of the Graduate School, the following are required:

A. Course Requirements

It is the policy of the Department of Molecular Genetics and Microbiology that a student must obtain a grade of B or higher in each course. Any course with a final grade below 3.0 must be retaken.

First Year

Fall

MCB 520 Graduate Biochemistry I

HBM 503 Molecular Genetics

HBM 509 Experimental Microbiology (laboratory rotations)

HBM 690 Microbiology Seminar

MCB 517 Biomembranes

BSB 515 Computational Methods in Biochemistry and Structural Biology

Spring

HBM 522 Biology of Cancer (offered in alternate years)

MCB 656 Cell Biology

HBM 510 Experimental Microbiology (laboratory rotations)*

HBM 690 Microbiology Seminar

HBM 692 Experimental Methods in Molecular Genetics and Microbiology

GRD 500 Integrity in Science

*Students rotate through three different laboratories over the course of their first year. At the end of that year, students must identify and enter the laboratory in which they will conduct their dissertation research.

Second Year

Fall

HBM 640 Molecular Mechanisms of Microbial Pathogenesis

HBP 533 Immunology

HBM 599 Graduate Research

HBM 690 Microbiology Seminar

HBM 691 Readings in Microbiology Literature

Spring

HBM 522 Biology of Cancer (offered in alternate years)

HBM 599 Graduate Research

HBM 690 Microbiology Seminar

B. Qualifying Examination

After the successful completion of all required courses, the student must pass a written qualifying examination.

C. Thesis Proposal Examination

In the fall semester of the third year, each student submits a written proposal of his or her dissertation research (similar to an NIH grant proposal) and orally defends that proposal before his or her dissertation committee shortly thereafter.

D. Advancement to Candidacy

After successfully completing of all required and elective courses, the written comprehensive examination, and the dissertation proposal examination, the student will be recommended to the Graduate School for advancement to candidacy.

E. Attendance and Participation in Student Seminar

Both before and after being advanced to candidacy, the student is expected to participate actively in the program's student seminar series.

F. Ph.D. Dissertation

The research for the Ph.D. dissertation is conducted under the supervision of the dissertation committee, which is appointed by the program and approved by the dean of the Graduate School. A formal public oral defense of the dissertation is scheduled, at which the student presents his or her findings and is questioned by members of the dissertation committee and other members of the audience. A closed oral examination before the dissertation committee follows the seminar.

G. Teaching Practicum

It is expected that each graduate student completing a doctoral degree will have functioned as a teaching assistant during at least two semesters of his or her graduate career.

H. Publication Requirement

All students must be the first author of at least one publication of original research in order to graduate.

Courses

HBM 503 Molecular Genetics

Introduces the classical work and current developments in lower and higher genetic systems. Covers gene structure and regulation in prokaryotic and eukaryotic organisms, mutational analysis and mapping, transposable elements, and biological DNA transfer mechanisms. Bacteriophage as well as lower and higher eukaryotic systems are used to illustrate aspects of molecular genetic structure and function. This course is offered as both MCB 503 and HBM 503.

Fall, 3 credits, ABCF grading

HBM 509 Experimental Microbiology

An introduction to modern microbiological research. The selection of laboratories is made in consultation with the student's advisory committee. By taking part in ongoing projects the student will learn experimental procedures and techniques and become acquainted with research opportunities in the department.

Fall, 1-8 credits, S/U grading

HBM 510 Experimental Microbiology

An introduction to modern microbiological research. The selection of laboratories is made in consultation with the student's advisory committee. By taking part in ongoing projects the student will learn experimental procedures and techniques and become acquainted with research opportunities in the department.

Spring, 1-8 credits, S/U grading

HBM 522 Biology of Cancer

A short course with the emphasis on cancer as a disease of man. Lectures address human cancer as seen by the clinician and as basic research relates to human disease. This course provides students with a link between courses in cell and molecular biology and the application of this basic information to tumor management.

*Spring, even years, 1 credit, ABCF grading
May be repeated for credit*

HBM 531 Medical Microbiology

Information derived from molecular and experimental cellular biology is presented to provide a foundation for understanding the basic aspects of the growth, regulation, structure, and function of viruses and prokaryotic and eukaryotic cells. The properties of the infectious agents are correlated to human diseases caused by these agents. Laboratory experiments demonstrate basic techniques to identify and quantitate microorganisms.

*Fall, 1-4 credits, ABCF grading
May be repeated for credit*

HBM 599 Graduate Research Microbiology

Original investigations under faculty supervision.

*Fall and spring, 1-9 credits, ABCF grading
May be repeated once for credit*

HBM 640 Molecular Mechanisms of Microbial Pathogenesis

This course covers the principles and molecular mechanisms of pathogenesis of a selected group of the best understood viral and bacte-

rial pathogens. A major focus of the course relates to pathogen modification of host extracellular and intracellular signalling events, as well as pathogen-host interactions pertaining to the innate, humoral and cellular responses to infection. The material is presented by invited lecturers who are leaders in their fields. This course is directed to graduate students, post-doctorate and medical fellows, and advanced medical students, who are contemplating careers in infectious disease research.

*Prerequisite: HBM, BMO 503, and BMO 520 3 credits, ABCF grading
May be repeated for credit*

HBM 690 Microbiology Student Seminar

A weekly meeting devoted to current work in the department. Enrolled students present seminars each week throughout the term.

*Fall and spring, 1 credit, S/U grading
May be repeated once for credit*

HBM 691 Readings in Microbiology Literature

Readings in microbiology literature covering areas of molecular biology and genetics.

*Fall, 1-2 credits, ABCF grading
May be repeated for credit*

HBM 692 Experimental Methods in Molecular Genetics and Microbiology

Students are introduced to the theory behind a variety of experimental methods used in modern molecular genetics laboratories through a series of formal lectures given by faculty in the Molecular Genetics and Microbiology graduate program as well as faculty from other biomedical graduate programs at Stony Brook University. Journal club-style classes alternate with these lectures in which the applications of these experimental methods are explored through discussions of papers from the literature.

*Prerequisite: Permission of instructor
Spring, 1-2 credits*

HBM 699 Dissertation Research on Campus

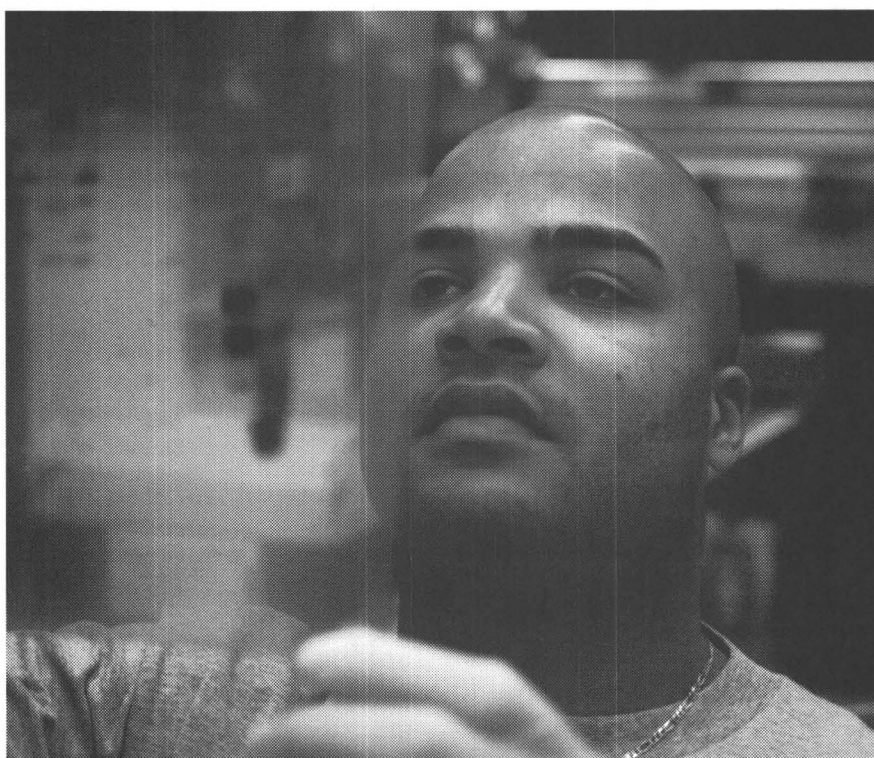
For the student who has been advanced to candidacy. Original research will be under the supervision of the thesis advisor and advisory committee.

Prerequisite: Advancement to candidacy (G5); permission of thesis advisor; major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab

*Fall, spring, and summer, 1-9 credits,
ABCF grading
May be repeated for credit*

HBM 700 Dissertation Research off Campus—Domestic

Prerequisites: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor; matriculation in graduate program or permission of instructor



*Fall, spring, and summer, 1-9 credits,
S/U grading
May be repeated for credit*

HBM 701 Dissertation Research off Campus—International

Prerequisites: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor; matriculation in graduate program or permission of instructor

*Fall, spring, and summer, 1-9 credits,
S/U grading
May be repeated for credit*

HBM 800 Full-Time Summer Research

Full-time laboratory research projects supervised by staff members.

*Prerequisites: Permission of instructor and full-time graduate student status
S/U grading
May be repeated for credit*

Music (MUS)

Chairperson: Daniel Weymouth, Staller Center 3310 (631) 632-7330

Graduate Program Director: Peter Winkler, Staller Center 3307 (631) 632-7330

Graduate Program Coordinator: Lynn Decker, Staller Center 3304 (631) 632-7330

Degrees awarded: M.A. in Music History and Theory; M.A. in Ethnomusicology; M.A. in Composition; M.M. in Music Performance; Ph.D. in History and Theory; Ph.D. in Ethnomusicology; Ph.D. in Composition; D.M.A. in Music Performance

The Department of Music offers programs which normally lead to the Master of Arts degree and the Doctor of Philosophy degree with graduate programs in Music History and Theory, in Ethnomusicology, and in Composition. The department also offers programs which normally lead to the Master of Music degree and the Doctor of Musical Arts degree in Music Performance.

Stony Brook's programs have grown out of an unusual partnership between the academy and the conservatory. The Music Department has a distinguished and well-balanced faculty in the areas of music history, theory, ethnomusicology, composition, and performance. The degree programs are designed to favor interaction among musical disciplines that have traditionally been kept separate. For example, the performance programs at Stony Brook all have an academic component. Graduate courses typically have a healthy mix of students from all areas. A number of courses are team taught by two or more faculty members, examining topics from several disciplinary viewpoints. Several examine music in a broader social context, drawing on such disciplines as ethnomusicology, cultural studies, and feminist theory. Interdisciplinary studies are central to the educational philosophy of the department. The department encourages the development of professional competence in more than one area of musical study. For students at the doctoral level who propose to do serious work both in performance and in some other area, a variety of options are available, including double degrees.

The music of the 20th and 21st centuries is a particular emphasis of both the performance and academic programs, but other areas are also amply represented. Students can choose seminars from a broad spectrum of topics, ranging from medieval music theory to popular music. Performing opportunities include Baroque Chamber Ensemble, Chamber Music, Jazz Ensemble, Contemporary Chamber Players, Camerata Singers, Stony Brook Symphony Orchestra, and Opera Workshop.

Facilities

Stony Brook's Staller Center for the Arts includes an acoustically excellent theatre-concert hall and a more intimate recital hall. The music building contains a full range of rehearsal and teaching facilities, over 70 practice rooms and studios for graduate students, and more than 40 Steinway grand pianos. A fully equipped electronic and computer music studio complex provides advanced facilities for electronic and computer music composition. Within the department, students have access to computing resources in the graduate student computing lounge, as well as the e-media SINC site (run by Instructional Computing), which has multimedia software and hardware. The department also has a collection of early instruments, including several harpsichords and organs, a consort of viols, and Renaissance wind instruments. The music library contains an extensive research collection of books, periodicals, scores, microfilms, and recordings, and includes an excellent state-of-the-art listening facility.

Admission

Admission to the M.A./Ph.D. Program at the Master's Level

The following are required for admission to the Graduate Program in Music History and Theory, in Ethnomusicology, and in Composition leading to an M.A. and/or Ph.D. degree, in addition to the Graduate School requirements:

- A. A bachelor's degree from a recognized institution;
- B. Official transcripts of undergraduate records;
- C. A minimum average of B in undergraduate music courses;
- D. Three letters of recommendation from persons familiar with the student's work;
- E. Examples of undergraduate work:
 1. For history and theory and ethnomusicology applicants, essays in music research, analysis, theory, or criticism

2. For composition applicants, musical scores and recordings

- F. Results of the Graduate Record Examination (GRE) General Test;

- G. Acceptance by both the Department of Music and the Graduate School.

Applicants are invited to submit any other evidence of their abilities in support of their application for admission, such as recordings of music performances or the score on the GRE Area Test in music.

All students entering the M.A. program will be examined in the following areas:

1. Ear training
2. Basic keyboard skills
3. The harmonization of a chorale in four voices
4. The composition of a passage in two-part counterpoint in either 16th-century or 18th-century style
5. The history of music (for history and theory and ethnomusicology students only)

The examinations in harmony and counterpoint will be sent to students after they have been admitted in the spring. The other examinations will be given during the week before the beginning of classes.

Students who are found deficient in any of the above areas will be required to take appropriate courses in the first year of study to remedy the deficiencies.

Admission to the M.M./D.M.A. Program at the Master's Level

The following are required for admission to the M.M. Program in Performance, in addition to the requirements of the Graduate School:

- A. A bachelor's degree from a recognized institution;
- B. Official transcripts of undergraduate records;
- C. An audition in the major field of performance: Students residing at a

distance from the University may gain provisional acceptance by sending a recorded audition. Audition dates, usually designated for February, are announced by the department mid-fall. These dates, as well as specific requirements for auditions, are posted at the departmental Web site.

D. Letters of recommendation from the former principal teacher and at least two other persons familiar with the student's work;

E. While acceptance into the program is based primarily upon excellence in performance, the program contains a significant academic component. Applicants are therefore required to submit two examples of their work in music history or music theory, such as papers completed as coursework in either area.

F. Acceptance by both the Department of Music and the Graduate School.

Entering students will be examined in ear training and foreign languages (for students with prior foreign language experience) during the week before the beginning of classes, and will be placed in the appropriate courses.

Admission to the Ph.D. Program

See Admission to the M.A./Ph.D. Program, above. In addition, a master's degree, usually in the pertinent area of competence, is required. As evidence of ability to carry on doctoral work in the area of specialization, applicants should submit examples of recent work as follows:

1. For composition: recordings and scores
2. For history and theory and ethnomusicology: essays that demonstrate a breadth of knowledge in two or more of the following areas: music history, theory, ethnomusicology, analysis, or criticism

Applicants who plan to include study in performance as a part of their degree program should follow the audition procedure outlined under Admission to the D.M.A. Program, below. Students who intend to work in a secondary area of specialization must demonstrate to the pertinent faculty competence commensurate with a master's degree at a distinguished level in that area.

Students who do not possess the Master of Arts degree in music from

Stony Brook will be asked to demonstrate achievement commensurate with that degree by the end of the first year of study by taking the relevant M.A. comprehensive examination.

Entering students who have not already done so must successfully complete the appropriate advisory examinations described under Admission to the M.A./Ph.D. Program. Any remedial work must be completed by the end of the first year of study.

Although most students will move directly from the master's to the doctoral level of the M.A./Ph.D. program, successful completion of the Stony Brook M.A. degree does not guarantee acceptance into the Ph.D.-level program. Students wishing to continue on must indicate their intention to do so, in a formal letter, to reach the Graduate Program Coordinator by January 15 for fall admission. This should be accompanied by two letters of recommendation from Stony Brook faculty. In order to demonstrate the ability to continue on at the doctoral level, students must submit appropriate examples of work: Master's papers for History and Theory, and Ethnomusicology; the Master's composition portfolio for Composition. Students may also elect to finish with the M.A. degree.

Admission to the D.M.A. Program

See Admission to the M.M./D.M.A. Program, above. In addition, a master's degree, usually in the pertinent area of performance, is required. Applicants must audition in person before a faculty committee. Audition dates, usually designated for February, are announced by the department mid-fall. These dates, as well as specific requirements for auditions, are posted at the departmental Web site.

Students who do not possess a Master of Music degree from Stony Brook must demonstrate a level of achievement in ear training, and demonstrate preparation in music history and theory, commensurate with the M.M. requirements. Voice students who do not possess a Master of Music degree from Stony Brook must also satisfy the piano proficiency and foreign language requirements of the Stony Brook M.M. degree in voice. Harpsichord students who do not have a Stony Brook M.M. must also satisfy the foreign language requirement of the Stony Brook M.M. in harpsichord.

Applicants who plan to include a secondary area of specialization in composition, ethnomusicology, history, or theory within their D.M.A. program must submit examples of work in the proposed secondary area and must demonstrate to the pertinent faculty competence commensurate with a master's degree at a distinguished level in that area. Students who are accepted in a secondary area of specialization must pass the appropriate advisory examinations described under Admission to the M.A. Program. Any remedial work must be completed by the end of the first year of study.

Although most students will move directly from the master's to the doctoral level of the M.M./D.M.A. program, successful completion of the Stony Brook M.M. degree does not guarantee acceptance into the D.M.A.-level program. Students wishing to continue on must indicate their intention to do so, in a formal letter, to reach the Graduate Program Coordinator by January 15 for fall admission. This should be accompanied by two letters of recommendation from Stony Brook faculty. In order to demonstrate the ability to continue on at the doctoral level, students must play a personal audition. Students may also elect to finish with the M.M. degree.

Faculty

Professors

Carr, Colin, Certificate of Performance, 1974, Yehudi Menuhin School: Cello.

Fuller, Sarah¹, Ph.D., 1969, University of California, Berkeley: Medieval and Renaissance music; history of music theory.

Haas, Arthur, M.A., 1974, University of California, Los Angeles: Harpsichord; performance of early music.

Kalish, Gilbert, B.A., 1956, Columbia University: Piano; chamber music; 20th-century piano repertory.

Lawton, David, Ph.D., 1973, University of California, Berkeley: Opera workshop; 19th-century studies.

Lochhead, Judith, Ph.D., 1982, Stony Brook University: Theory and history of recent music; phenomenology and music; performance and analysis.

Mount, Timothy, *Director of Choral Music*. D.M.A., 1981, University of Southern California: Choral conducting.

Silver, Sheila, Ph.D., 1976, Brandeis University: Composition; analysis.

Winkler, Peter², *Graduate Program Director*. M.F.A., 1967, Princeton University:

Composition; theory and history of popular music.

Associate Professors

Goldstein, Perry³, *Coordinator of Musicianship*. Ph.D., 1986, Columbia University: Composition.

Semegen, Daria, *Director of the Electronic Music Studio*. M.Mus., 1971, Yale University: Composition; electronic music; composition, history, and aesthetics of electronic music.

Sugarman, Jane⁴, Ph.D., 1993, University of California, Los Angeles: Ethnomusicology; musics of Southeastern Europe and the Middle East; gender issues.

Weymouth, Daniel, *Chairperson, Director of the Computer Music Studio, and Co-Director, Laboratory for Technology in the Arts*. Ph.D., 1992, University of California, Berkeley: Composition; analysis; computer music; multimedia and performance technologies.

Assistant Professors

Carver, Joseph, D.M.A., 1992, Stony Brook University: Double Bass, chamber music.

Dahl, Christina, M.M., 1989, Peabody Conservatory of Music: Piano accompaniment; chamber music.

Gordon, Bonnie, Ph.D., 1998, University of Pennsylvania: Baroque music; Monteverdi; gender studies.

Long, Timothy, M.M., 1992, Eastman School of Music: Vocal coach; conducting.

Minor, Ryan, Ph.D., 2005, University of Chicago: 19th-century music; choral music; Brahms; Wagner; opera.

Moehn, Frederick, Ph.D., 2001, New York University: Musicology; ethnomusicology.

Performing Artists in Residence

Bonazzi, Elaine, B.Mus., Eastman School of Music: Voice; vocal repertory.

Cobb, Kevin, M.M., 1995, Juilliard School of Music: Trumpet.

Frank, Pamela, B.Mus., 1989, Curtis Institute of Music: Violin.

Gilbert, Daniel, M.M., 1988, Juilliard School of Music: Clarinet.

Kavafian, Ani, M.S., 1972, Juilliard School of Music: Violin.

Leandro, Eduardo, M.M., 1999, Yale University: Percussion; chamber music.

Murdock, Katherine, B.Mus., 1977, Boston University: Viola; chamber music.

Powell, Michael, B.Mus., 1973, Wichita State University: Trombone; chamber music.

Purvis, William, B.A., 1971, Haverford College, student of Forrest Standley and James Chambers: Horn; chamber music.

Taylor, Stephen, Diploma, 1974, Juilliard School of Music: Oboe; chamber music.

Trakas, Chris Pedro, M.M., 1980, University of Houston: Voice.

Willard, Jerry, student of Sophocles Papas: Guitar; lute.

Wincenc, Carol, M.M., 1972, Juilliard School of Music: Flute; chamber music.

Quartet-in-Residence

The Emerson String Quartet: In fall 2002, the celebrated Emerson String Quartet became the quartet-in-residence at Stony Brook. This prestigious ensemble presents a series of concerts, chamber music instruction, and workshops at the University every year.

Drucker, Eugene, Mus.D., 1995, Middlebury College: Violin; chamber music.

Dutton, Lawrence, M.M., 1978, Juilliard School; Mus.D., 1995, Middlebury College: Viola; chamber music.

Finckel, David, Mus.D., 1995, Middlebury College: Cello; chamber music.

Setzer, Philip, M.M., 1974, Juilliard School; Mus.D., 1995, Middlebury College: Violin; chamber music.

Directors

Deaver, Susan, *Director of the University Orchestra*. D.M.A., 1994, Manhattan School of Music: Conducting.

Engel, Bruce, *Director of the University Wind Ensemble*. M.M., 1974, Juilliard School of Music: Conducting.

Number of teaching, graduate, and research assistants, fall 2005: 71 (full or partial support)

1) Recipient of the President's Award for Excellence in Teaching, 1984

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1977

3) Recipient of the President's Award and the State University Chancellor's Award for Excellence in Teaching, 1997

4) Recipient of the President's Award and the State University Chancellor's Award for Excellence in Teaching, 1995

5) Recipient of the Chancellor's Award for Excellence in Faculty Service, 2004.

Degree Requirements*

General Requirements for the M.A. Degree

Thirty graduate credit hours (exclusive of those in MUS 501 *Compositional Skills of Tonal Music*, MUS 505 *Foundations of Musicianship*, and MUS 591 *Practicum in Teaching*) chosen in consultation with the student's advisor. A student must achieve an overall 3.0 grade point average in order to receive a degree. The program must include:

1. MUS 501 *Compositional Skills of Tonal Music*, to be taken during the fall semester of the first year of study. Qualified students may be exempted from this course through a placement

exam that will be given in the summer before they begin the program.

2. MUS 502 *Proseminar in Tonal Analysis*, to be taken during the spring semester of the first year of study. Students who are well prepared in analysis may be exempted from this requirement by examination. (Not required for ethnomusicologists.)

3. MUS 505 *Foundations of Musicianship*, and MUS 506 *Graduate Musicianship*, to be taken during the first year of study. Qualified students may be exempted from these courses through a placement exam given at the beginning of the fall semester.

If a course in a department or program other than Music is taken toward the degree, approval from the graduate studies committee must be obtained.

**Note: All graduate students whose programs have a foreign language requirement (M.A. in Music History and Theory, M.A. in Ethnomusicology, Ph.D., D.M.A., and M.M. in harpsichord) must take the appropriate foreign language exam during their first semester of residence. Students who fail the examination must take an appropriate language course or retake the examination (depending on the program) after demonstrating evidence of formal preparation (such as a course or private tutoring).*

Specific Requirements for the M.A. Degree, Graduate Program in Music History and Theory

A. Course Requirements

In addition to the general course requirements for the M.A. degree listed above, the M.A. in Music History and Theory requires:

1. MUS 500 *Introduction to Music Research*

2. MUS 503 *Music in the 20th Century*

3. At least two courses from the group MUS 541-555 (*Special Topics Courses*)

4. At least two courses chosen from the following courses in theory and analysis: MUS 538, MUS 557, MUS 559

B. Foreign Languages

A reading knowledge of French and German is required. One exam must be taken at the beginning of the first semester of study and the other at the beginning of the second semester.

C. Comprehensive Examinations

Written and oral examinations in the history of music and in the analysis of pre-assigned compositions.

D. Research Paper

A substantial essay, normally one the student has written as part of the coursework, is required. The paper should be submitted no later than the third week of the semester in which the student expects to receive the degree.

Specific Requirements for the M.A. Degree, Graduate Program in Ethnomusicology

A. Course Requirements

In addition to the general course requirements for the M.A. degree listed above, the M.A. in Ethnomusicology requires:

1. MUS 500 Introduction to Music Research
2. MUS 537 Research Methods in Ethnomusicology
3. MUS 539 Proseminar in Ethnomusicology
4. At least two courses in musics of a world area (MUS 536)
5. At least two courses in the cross-cultural study of music (at least one must be MUS 541; the other may be must 541, 542, 538, or selected topics from 555)

B. Foreign Languages

A reading knowledge of one major European language other than English: French, German, Spanish, Russian (second language to be completed at Ph.D. level).

C. Comprehensive Examinations

Written examinations on the history of ethnomusicological theory and on the analysis of world music repertoires.

D. Research Paper

A substantial essay, normally one the student has written as part of the coursework, is required. The paper should be submitted no later than the third week of the semester in which the student expects to receive the degree.

Specific Requirements for the M.A. Degree, Graduate Program in Composition

A. Course Requirements

In addition to the general course requirements for the M.A. degree listed above, the M.A. in Composition requires:

1. A course in the history of music, normally MUS 503, Music in the 20th Century or MUS 507, Studies in Music History
2. MUS 504 Analysis of 20th-Century Music; students who are well prepared in 20th-century analysis may be exempted from this course by examination and must substitute an advanced course in 20th-century theory or analysis (for example, MUS 557, Topics in Theory, or MUS 559, Topics in Analysis, when either of these courses are devoted to a 20th-century topic)
3. MUS 515 The Fundamentals of Electronic Music
4. MUS 516 Electronic Music Workshop or MUS 517 Introduction to Computer Music
5. MUS 523 Advanced Composition, to be taken every semester of residence

B. Comprehensive Examination

Written examination in the analysis of pre-assigned compositions is required.

C. Compositions

Students must satisfy the departmental requirement that they have written compositions of sufficient quality and variety during the period of study after admission to the Graduate School. Fair copies of all these compositions must be submitted to the graduate program committee as they are completed. The last day for graduate students to submit theses and dissertations, as specified in the academic calendar, will be the final deadline for all works to be submitted.

Note: There is no foreign language requirement for the M.A. in Composition. However, students should be aware

that a reading knowledge of French, German, Italian, or Spanish is required for the Ph.D. in Composition.

Requirements for the M.M. Degree

A. Course Requirements

Thirty graduate credit hours (exclusive of those in MUS 501 Compositional Skills of Tonal Music, MUS 505 Foundations of Musicianship, and MUS 591 Practicum in Teaching) chosen in consultation with the student's advisor. A student must achieve a 3.0 overall grade point average or better to receive a degree. Up to 15 credits in individual study of the major instrument or voice may be counted toward the degree. None of the remaining 15 degree credits may be in individual study of another instrument or voice.

The program must include at least one course in music history (MUS 503 or 507) and one course in music theory (MUS 502, 504, 508, 514, 515, 517, or 521). Students who can demonstrate adequate preparation may take more advanced courses to fulfill this requirement.

Students who play orchestral instruments are required to enroll in MUS 565, Stony Brook Symphony Orchestra, every semester of full-time residence. Students who are registered part-time are required to participate in the Stony Brook Symphony Orchestra on a part-time basis. Under extraordinary circumstances a student may petition to have this requirement waived on a per-concert basis; a memorandum outlining policies and procedures for such a waiver is available from the Music Department's Graduate Office.

Students in voice are required to enroll in MUS 566, Camerata Singers, or MUS 579, Opera Workshop, for two semesters. This requirement may be waived at the request of either the conductor or the major teacher.

Participation in the accompaniment pool is required of all pianists and harpsichordists during each semester of full-time residence. Students in harpsichord are expected to participate in Baroque Chamber Ensemble for two semesters. All students except those in the conducting programs must be enrolled in MUS 571 (lessons) during each semester of full-time residence. All full-time performance students are required to take MUS 590 (Practicum in Professional Skills) each semester.

All students are required to enroll in a formal chamber music course during the

first two semesters of residency: MUS 573 Chamber Music, MUS 584 Baroque Chamber Ensemble, MUS 595 Chamber Players, MUS 596 Contemporary Chamber Players, or MUS 568 Jazz Ensemble.

If a course in a department other than Music is taken toward the degree, approval from the graduate studies committee must be obtained.

B. Ear Training

MUS 505, Foundations of Musicianship, and MUS 506, Graduate Musicianship, must be taken during the first year of study. Qualified students may be exempted from these courses through a placement exam given at the beginning of the fall semester.

C. Piano Proficiency

Students in voice and choral conducting are required to take the piano proficiency examination upon entering the program. Those who do not pass the examination must take appropriate courses and pass the examination before the degree will be granted.

D. Jury Examinations

Jury examinations are offered each semester. Students must take one jury examination, generally the semester before the degree recital.

For students in harpsichord, the examinations will include continuo realization.

E. Foreign Language

Harpsichord students must demonstrate knowledge equivalent to a year's college-level study of either French or German. Equivalency is generally demonstrated by passing the exam given by the Department of European Languages, Literatures, and Cultures and/or taking courses offered by the Department of European Languages, Literatures, and Cultures. (See section E under the Requirements for the Doctor of Musical Arts, below, for more details.)

F. Public Recital

The student's major teacher and academic advisor must determine whether or not the recital is of passing quality. If unable to attend the recital in person, the major teacher or academic advisor may hear a recording of it.

Requirements for the Doctor of Philosophy Degree, Contract Toward Candidacy

A plan of study in the form of a working contract toward candidacy will be drawn up by the student and a directing committee early in the student's first semester. The directing committee will consist of the student's advisor and at least two other faculty members. The graduate program director will appoint the directing committee and will designate its chairperson, who shall not be the student's advisor. The committee may include faculty members from outside the department when appropriate. Final approval of the contract, and of any revisions that may be necessary, rests with the graduate studies committee.

The design of the program is to be developed around the requirements given below, and the contract should specify such terms as the core of courses to be taken, the length of full-time residence, and the schedule and subject areas of various examinations including the preliminary examination. The terms of the contract should normally be completed within two or three years, depending upon the scope of the program. Successful completion of relevant master's requirements is assumed for the Ph.D. degree; see Admission to the Ph.D. Program.

A. Work in the Student's Area(s) of Specialization

Progress during residence in the program will be demonstrated to the directing committee in the following ways:

1. Evidence of advanced scholarly and creative work:

a) Students in History and Theory or Ethnomusicology: The presentation of a number of essays demonstrating proficiency in various aspects of musicological research, theoretical studies, analysis, or criticism. The essays may have been prepared as part of coursework.

b) Composition students: The presentation of a number of musical compositions demonstrating fluency in working with a variety of contemporary performance media.

2. A field exam demonstrating knowledge of scholarship and repertoire in the broad field of study that will situate dissertation research.

3. A public colloquium. The topic will be determined by the student, in consultation with his or her directing committee. For composers, the lecture or colloquium must be on a topic of significant interest in music of the 20th- or 21st-century music. See section B, paragraph 2 below.

Students who propose to do work in performance as an integral part of the program must, in addition, present at least two recitals showing mastery of a broad range of musical styles.

B. Work in the Area of 20th- and 21st-Century Music

Competence is to be demonstrated to the directing committee through the following:

1. An essay dealing with 20th- or 21st-century music from a historical, theoretical, critical, or analytical point of view.

2. A public lecture or colloquium on a topic of significant interest in 20th- or 21st-century music. See the description of MUS 696.

In order to satisfy the requirement, composers must complete both the essay and the lecture or colloquium. Historians and theorists and ethnomusicologists may satisfy the requirement either with the essay or with the lecture or colloquium.

C. Foreign Language

Reading knowledge of German and French for students in History and Theory is required. For students in Ethnomusicology, a reading knowledge of a second language in addition to that completed for the M.A. is required; this will usually be a language for field research. For Composition students, reading knowledge of one language (from French, German, Italian, or Spanish) is required. (See M.A. language requirements, above.) The contract toward candidacy may specify further or alternate language proficiency depending on the area of the dissertation, subject to the approval of the graduate studies committee.

D. Teaching

A minimum of two semester-long courses or the equivalent, at least one of which shall be an introductory college course in musicianship, theory, or literature, is required. Students must also participate in the seminar on

the teaching of music for a minimum of one semester.

E. Advancement to Candidacy

After completing the terms of the contract, a student is eligible for advancement to candidacy. To be advanced, the student must:

1. Submit a prospectus outlining the nature and aims of the dissertation.
2. Pass a preliminary examination that will demonstrate preparation in his or her special competence. For historians and theorists and ethnomusicologists, the examination will be focused on a detailed prospectus and bibliography for the dissertation. For composers, the examination will cover the composer's musical craft and aesthetics, as revealed in the contract pieces (copies of which must be provided to the graduate program director), and the projected thesis composition.

F. Dissertation

The dissertation shall be a significant original work of scholarship or composition. Approval of the dissertation will rest upon a formal oral defense, which is also a public colloquium on the dissertation work, to be conducted by the dissertation committee.

Requirements for the Doctor of Musical Arts Degree with a Concentration in Performance, Doctoral Contract

A plan of study in the form of a working doctoral contract will be drawn up by the student and a directing committee early in the student's first semester. The directing committee will consist of the student's advisor (major teacher) and a member of the academic faculty, to be appointed by the graduate program director. The committee may include additional faculty members from within or outside the department if appropriate. Final approval of the contract, and of any revisions that may be necessary, rests with the graduate studies committee.

The design of the program is to be developed around the requirements given below, and the contract should specify the core of courses to be taken; the length of full-time residence; and the schedule and substance of various recitals, essays, and examinations. The term of the contract should normally be completed within two years of full-time residence.

A. Work in the Student's Area of Specialization

Progress during residence in the program will be demonstrated to the directing committee through the presentation of four recitals, not including the doctoral degree recital, showing mastery of a broad range of musical styles. Two of these must be solo recitals, unless otherwise specified by the directing committee. Three of these recitals must be presented before the student can advance to candidacy; the fourth may be presented after advancement to candidacy. Students who propose to work in a second area of specialization should see section J below.

Students in the choral conducting program present three recitals, not including the doctoral degree recital. Two of these recitals must be completed before the students can advance to candidacy.

B. Academic Coursework and the D.M.A. Research Essay

During the first year of residency, students must take two academic courses and receive a grade of B or better in each. One course must be a history course from the group: MUS 503, 507, 535, or any numbered MUS 539-555. The other must be an analysis or theory course from the group: MUS 502, 504, 538, 557, or 559. Students will develop one of the term papers generated in these two academic courses into the D.M.A. Research Essay. After conferring with the academic advisor on which paper to use for the research paper, the student must enroll in MUS 695, Doctoral Essay Tutorial, during the third term of residency to develop and revise the original course term paper.

C. Public Lecture-Recital

A colloquium illustrated by live performance, the lecture-recital may deal with performance problems, historical or analytical matters, or with interpretative or critical issues. The music performed in the lecture-recital may also appear on one of the doctoral recital programs, but not in the final doctoral recital. Students must enroll in MUS 696, Doctoral Colloquium, and present the lecture-recital during that semester.

D. Work in the Area of 20th- and 21st-Century Music

The recitals, described above in section A, should include a substantial amount of music from the 20th and 21st

centuries (the equivalent of at least one full recital's worth) including recent and challenging works. The lecture-recital may also be devoted to music of the 20th and 21st centuries.

E. Foreign Language

Proficiency in one or more foreign language is required for the D.M.A. degree. There are two types of requirements: (1) knowledge equivalent to a year's college-level study or (2) "reading knowledge." Depending on the program, the student may have to satisfy one or the other, or both types of requirements.

Choral conducting students and harpsichord students must demonstrate knowledge equivalent to a year's college-level study of any two of the following languages: French, German, or Italian.

Instrumental students other than harpsichord must demonstrate knowledge equivalent to a year's college-level study of any one of the following languages: French, German, or Italian.

Equivalency is determined by passing the exam given by the Department of European Languages, Literatures, and Cultures and/or taking courses offered by the Department of European Languages, Literatures, and Cultures. Students with prior language experience should take the exam given by the Department of European Languages, Literatures, and Cultures during the advisory exam period before the first semester of study. Students who do not pass the examination must take the courses recommended by the Department of European Languages, Literatures, and Cultures during the first year of residency and achieve a grade of B or higher. Students who have not had any previous foreign language study must take a year of college-level elementary foreign language courses and achieve a grade of B or higher to satisfy the requirement. The graduate review courses FRN 500, GER 500, and ITL 500 will not satisfy the Music Department's foreign language requirement.

Voice Students: Since the study of foreign languages is central to a singer's craft, the foreign language requirement for singers is more demanding than it is for instrumentalists. Voice students must demonstrate knowledge equivalent to a year's college-level study of *all three* of the following languages: French, German,

and Italian. Students with prior language experience should take the exam given by the Department of European Languages, Literatures, and Cultures during the advisory exam period before the first semester of study. Students who do not pass the examination must take the appropriate courses and achieve a grade of B or higher to satisfy the requirement. Voice students must also demonstrate a reading knowledge of any two of the following languages: French, German, Italian, or Russian. Reading knowledge is determined solely by the Music Department Translation Exam. Finally, voice students must demonstrate singing competence in Italian, French, and German as part of the Doctoral Jury Examinations.

For all D.M.A. programs, the foreign language requirement must be satisfied in a timely manner, preferably by the end of the first year of study. In any case, all language requirements must be satisfied before advancement to candidacy, except in programs where more than one language is required. In these programs only, all but one language requirement must be satisfied before advancement; the remaining language may be satisfied after advancement to candidacy.

The contract toward candidacy may specify further or alternate language proficiency depending upon the proposed plan of study, subject to the approval of the graduate studies committee.

F. Teaching

A minimum of two semester-long courses, either or both of which may comprise individual lessons, ensemble coaching, or classroom teaching, is required. In certain cases, this requirement may be met by private teaching or teaching at another institution (see the graduate program director for details.)

G. Practicum in Professional Skills

A professional performing musician, who is more likely than ever before to assemble a career and a livelihood from a wide variety of music-related activities, needs a wide variety of practical skills, not all of which can be acquired in formal courses or even necessarily within the confines of the academy. Thus, every full-time D.M.A. student in residence must register for MUS 690 Practicum in Professional Skills. This course covers practical training in

activities related to the professional work of a performing musician, including solo and ensemble performance, teaching, internships, and related work, both on campus and off campus.

H. Orchestra/Accompaniment

Students who play orchestral instruments are required to enroll in MUS 565, Stony Brook Symphony Orchestra, every semester of full-time residence. Students who are registered part-time are required to participate in the Stony Brook Symphony Orchestra on a part-time basis. Under extraordinary circumstances, a student may petition to have this requirement waived on a per-concert basis; a memorandum outlining policies and procedures for requesting such a waiver is available from the Music Department's Graduate Office. Students in voice are required to enroll in MUS 566, Camerata Singers, or MUS 579, Opera Workshop, for two semesters. This requirement may be waived at the request of either the conductor or the major teacher. Pianists and harpsichordists are required to participate in the accompaniment pool during each semester of full-time residency.

I. Chamber Music

All students are required to enroll in a formal chamber music course during the first two semesters of residency: MUS 573 Chamber Music, MUS 584 Baroque Chamber Ensemble, MUS 595 Chamber Players, MUS 596 Contemporary Chamber Players, or MUS 568 Jazz Ensemble. Students in the choral conducting program should fulfill this requirement by conducting chamber music (see Professor Timothy Mount for details).

J. Secondary Area of Specialization

Students who propose to do advanced work in composition, history and theory, or ethnomusicology as an integral part of the program must do one or both of the following:

1. Present a number of musical compositions demonstrating fluency in working with a variety of contemporary performance media.
2. Present a number of essays demonstrating proficiency in various aspects of musicological research, theoretical studies, analysis, or criticism. The essays may have been prepared as part of coursework.

K. Doctoral Jury Examinations

A preliminary doctoral jury will be played during the first full year of residency. A second, 20-minute jury examination will be taken at the end of the period of residency covered under the contract toward candidacy. Both juries must be passed as a condition for advancement to candidacy.

L. First-Year Academic Review

In order to be in good standing, D.M.A. students must have taken the two academic courses required (History and Theory) by the end of the first year of the program, and must have taken the foreign language proficiency exam, or be in the appropriate language course, by the beginning of the second semester. The graduate program director will monitor the academic progress of D.M.A. students by asking all academic advisors to submit contract checklists in February of each year.

M. Advancement to Candidacy

The student may advance to candidacy after completion of the following requirements:

1. Three of the four public recitals (see Requirement A).
2. Completion of Requirements B through M. In programs which require more than one language, all but one language.

Advancement to candidacy is granted by the Graduate School upon recommendation from the departmental graduate program director.

N. Completion of the Doctoral Contract

The Doctoral Contract will be completed after presentation of the fourth public recital (see Requirement A), and completion of any remaining language requirement (see Requirement E).

O. Doctoral Degree Recital Examination

After the doctoral contract is completed, the student must:

1. Submit a program of the proposed doctoral degree recital, bearing the signature of the major teacher, to the graduate program director and graduate studies committee for approval. The program must not include works previously performed to satisfy other graduate degree requirements.
2. Submit a doctoral examination prospectus that focuses on significant

analytical, historical, and interpretative aspects of the works to be performed. The prospectus will serve as the basis of the doctoral examination. Students may request a sample prospectus and should review the Oral Exam Guidelines prior to the exam (this document is available from the graduate coordinator).

3. Appear before an examining committee to demonstrate mastery of the doctoral degree recital program and of areas pertinent to the works to be performed. The doctoral degree recital examination normally takes place within one year after advancement to candidacy.

P. Doctoral Degree Recital

The doctoral degree recital should be performed after the degree recital examination has been passed. It must demonstrate a distinguished, professional level of performance and be presented on campus, except under extraordinary circumstances for students in Choral Conducting. A recording of this recital, along with the program and the doctoral examination prospectus, is submitted to the Graduate School and is eventually deposited in the University library.

Courses

MUS 500 Introduction to Music Research

Taught by members of the history and theory faculty, the course offers an introduction to musical research techniques, bibliography, and methodologies through a series of two-week units covering a wide range of topics of current concern in musical scholarship. Recent topics have included sketches and critical editions, interdisciplinary studies, issues in theory and analysis, and popular music studies. Students prepare short projects and/or presentations for each unit.

Fall, 3 credits, ABCF grading

MUS 501 Compositional Skills of Tonal Music

An intensive course in chorale harmonization and counterpoint. (Enrollment limited to 12. MUS 501 may not be included in the courses taken in fulfillment of degree requirements.)

Fall, 3 credits, ABCF grading

MUS 502 Proseminar in Tonal Analysis

The application of various techniques of analysis to tonal works. Rhythmic, harmonic, linear, thematic, and other elements of musical structure are considered. Preparation equivalent to MUS 501 is assumed.

Spring, 3 credits, ABCF grading

MUS 503 Music in the 20th and 21st Centuries

An intensive course in contemporary musical styles, focusing on historical problems. Seminar reports and research papers on works of major significance.

Fall, 3 credits, ABCF grading

MUS 504 Analysis of Music of the 20th and 21st Centuries

Detailed analyses of various works that are representative of the significant compositional systems of recent music.

Fall, 3 credits, ABCF grading

MUS 505 Foundations of Musicianship

An intensive workshop in the skills of sight singing and dictation of tonal melodies, rhythm, and diatonic harmony. Repertoire is drawn from diverse styles and periods. Qualified students may be exempted from this course through a placement exam given at the beginning of the fall semester.

Fall, 2 credits, ABCF grading

MUS 506 Graduate Musicianship

An intensive workshop in the development of musicianship skills in advanced tonal and atonal music. The course includes dictation in a variety of harmonic, melodic, and rhythmic categories and prepared singing and sight-singing of complex tonal and atonal melodies (in bass, alto, tenor, and treble clef). Qualified students may be exempted from this course through a placement exam given at the beginning of the fall semester.

Spring, 2 credits, ABCF grading

MUS 507 Studies in Music History

Concentrated study of the works of a single composer, or of repertoires that represent single compositional tendencies in Western music. Recent topics have included Mozart's operas, Goethe's Faust and the symphonic tradition, Bach cantatas, virtuosity, Stravinsky, music and nationalism, and introduction to popular music studies. Not more than eight credits of MUS 507, 508, and 509 combined may be counted toward the degree.

Fall and spring, 3 credits each semester, ABCF grading

May be repeated for credit

MUS 508 Studies in Composition and Theory

Study of contemporary or traditional compositional techniques or styles, including both analysis and exercises in writing. Not more than eight credits of MUS 507, 508, and 509 combined may be counted toward the degree.

Spring, 1-3 credits, ABCF grading

May be repeated for credit

MUS 509 Performance Studies

Study of an instrument or voice as a supplement to other work in a graduate music program. This course is designed for students who require piano study in order to pass the piano proficiency requirement, and for students not in a performance degree program who wish to study voice or an instrument.

Fall and spring, 1-3 credits, ABCF grading

May be repeated for credit

MUS 513 Workshop in Instrumentation and Orchestration

Studies in writing for specific instruments and ensembles through practical exercises and examination of the repertory. Faculty and student performers discuss the capabilities of their instruments and perform and discuss exercises written for the class.

Spring, 3 credits, ABCF grading

MUS 514 Audio Engineering

Technical fundamentals of audio engineering for the serious practitioner, with primary emphasis on sound reinforcement and recording arts. The course focuses on measurement and critical listening, and investigates the basic operational theory of principal devices and systems.

Spring, 3 credits, ABCF grading

MUS 515 The Fundamentals of Electronic Music

A short survey of the history and literature of the medium is followed by study of the pertinent background in theoretical acoustics and practical engineering. Students are instructed in the basic techniques of electronic sound production and modification.

Fall, 3 credits, ABCF grading

MUS 516 Electronic Music Workshop

Individual short experimental works or specific assignments. Uses of electronic music equipment.

Spring, 3 credits, ABCF grading

MUS 517 Introduction to Computer Music

A hands-on introduction to the uses of computers in the creation and performance of music. Topics include software synthesis, computer manipulation of natural sound, MIDI instruments and their use, and interactive performance. There is a brief survey of the history, literature, and repertoire of the field.

Spring, 3 credits, ABCF grading

MUS 518 Advanced Projects in Computer Music

Advanced projects, individual or collaborative, in computer music.

Fall and spring, 1-3 credits, ABCF grading

May be repeated for credit

MUS 523 Advanced Composition

Individual projects for graduate students in composition.

Fall and spring, 2-6 credits, ABCF grading

May be repeated for credit

MUS 535 Lecture-Workshop in the Performance of Baroque Music

An examination of problems confronting the performer of music from the period ca. 1600-1750, from both musicological and practical points of view. The basso continuo, its function and realization; phrasing and articulation; ornaments, notated and improvised; period instruments; aspects of notation; bibliography. The course meets in lecture for two hours each week with a third hour devoted to the coaching of a rehearsal or performance of music prepared by members of the class.

Spring, alternate years, 3 credits,

ABCF grading

MUS 536 Area Studies in Ethnomusicology

Examination of the music of a selected world area, combining musical analysis with a consideration of historical, social, and performance contexts. Recent topics have included Brazilian music from 1822 to the present; music, politics, and society in Eastern Europe; and a century of Middle Eastern musics.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

MUS 537 Research Methods in Ethnomusicology

A practicum covering both the theoretical foundations and practical components of ethnomusicological field research and analysis. Emphasis is on designing and undertaking a small musical ethnography, and on exploring practical, ethical, ontological, and epistemological aspects of ethnomusicological research. Weekly readings and a final project.

3 credits, ABCF grading

MUS 538 Phenomenological Approaches to Music Analysis

Concepts from phenomenological philosophy are used as a basis for the study of music from various periods and cultures, with an emphasis on recent music in the Western classical tradition. Readings include Heidegger, Husserl, and later writings in phenomenology; philosophies of space and time; and music theoretic studies by Clifton, J. Kramer, Lewin, and others.

*Spring, alternate years, 3 credits,
ABCF grading*

MUS 539 Proseminar in Ethnomusicology

An introduction to the field of ethnomusicology as practiced in Europe and North America over the past century. Theoretical and methodological approaches in ethnomusicology are examined as they relate to major periods in the history of ethnographic disciplines.

Fall, 3 credits, ABCF grading

MUS 540 Studies in Cultural Historiography

This course is intended to promote the student's knowledge and reflection about the study of the history of the arts as history. It is organized on the following topics: origins and philosophical foundations of the modern historical consciousness; the nature of historical knowledge and explanation; historiographic models; and origins, philosophical foundations, and genres of historical musicology.

Spring, alternate years, 3 credits, ABCF grading

Special Topics (MUS 541–559)

Topics chosen each time a course is offered will depend upon the needs of the students and interest of the instructor.

MUS 541 Topics in the Cross-Cultural Study of Music

Examination of a topic of current interest in the cross-cultural study of music. Readings from various intellectual traditions in the humanities and social sciences provide a context within which to appraise recent

research in ethnomusicology, historical musicology, and popular music studies, and to formulate possible directions for future research. Representative topics include music and gender, music and the media, music and power, and performance and performers.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

MUS 542 Ethnomusicology and Social Theory

An introduction to major schools of social theory as they may be applied to the analysis of music and related performance forms. Theoretical writings in sociology, anthropology, philosophy, cultural studies, and related fields will be paired with case studies that situate musical creation, performance, and dissemination within the unfolding of societal processes.

*Spring, alternate years, 3 credits,
ABCF grading*

MUS 543 Topics in Medieval Music

Study of a focused area in medieval music, such as the works of Guillaume de Machaut, transmission processes, and the Notre Dame repertory.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

MUS 547 Topics in Baroque Music

Historical problems in music of the Baroque era. Recent topics have included German Passion settings, theories of expression and representation, and musical rhetoric.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

MUS 549 Topics in 18th-Century Music

Investigation of critical, analytical, and historical issues in 18th-century music, such as the interpretation of sketches and fragments, counterpoint teaching in the 1790s, and the music of Mozart.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

MUS 553 Topics in 19th-Century Music

Historical, analytical, and critical issues in the music of the 19th century. Recent topics have included Italian opera, the unfinished works of Schubert, and genre in Chopin's oeuvre.

*Spring, alternate years, 3 credits,
ABCF grading
May be repeated for credit*

MUS 555 Topics in 20th-Century Music

Focused study of selected issues in music of the 20th century. Recent topics have included primitivism and exoticism; quotation, borrowing, and collage; the music of Roger Sessions; and the Second Viennese school.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

MUS 557 Topics in Theory

Studies in the writings of music theorists from the Middle Ages through the present day in the context of contemporary repertoires. Recent topics have included modal theory as a model for melodic construction; efforts to adapt modal theory to polyphonic practice; rhythm in theory and practice; theories of tonality from Rameau to Schenker;

theoretical approaches to post-tonal and 12-tone music; and theories of timbre and texture.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

MUS 559 Topics in Analysis

Intensive analytical study of selected works and exploration of analytical problems. Recent topics have included analysis and performance, melody, Xenakis and Ligeti, Beethoven's late quartets, Berg's Lulu, spectral music, and the string quartet since 1945.

*Spring, alternate years, 3 credits, ABCF grading
May be repeated for credit*

MUS 563 Advanced Choral Conducting A

Advanced training in preparing and conducting choral works. Students spend a semester in score study, receive individual private instruction, and are expected to participate in the rehearsing of the University Chorus, the University Chorale, and the Chamber Singers. Open only to students enrolled in graduate conducting programs.

Fall and spring, 3-6 credits, ABCF grading

MUS 564 Advanced Choral Conducting B

Advanced training in preparing and conducting choral works. Not open to students enrolled in the graduate conducting programs.

Fall and spring, 3 credits, ABCF grading

MUS 565 Stony Brook Symphony Orchestra

Study and performance of orchestral works from the Baroque period to the present.

*Fall and spring, 1-2 credits, ABCF grading
May be repeated for credit*

MUS 566 Camerata Singers

Study and performance of choral works for chamber chorus from all periods of music history.

*Fall and spring, 1 credit, ABCF grading
May be repeated for credit*

MUS 567 Master Class in Orchestral Repertory

Study of orchestral parts for sections (brass, strings, woodwinds) or for individual instruments. The course emphasizes overall ensemble skills and audition preparation. Different sections directed toward specific groups. See the course listing for offerings in any particular semester.

*Fall and spring, 1-2 credits, ABCF grading
May be repeated for credit*

MUS 568 Jazz Ensemble

Study and performance of works for jazz ensemble from the early 20th century to the present.

*Fall, 1-2 credits, ABCF grading
May be repeated for credit*

MUS 569 Performance Problems in 20th-Century Music

A study of performance skills required in new music, with emphasis on polyrhythms, composite rhythms, control of tone color and dynamics, and the understanding of new methods of notation. Exercises and the study

of selected 20th-century works.

Fall, 2 credits, ABCF grading

MUS 570 Introduction to the History and Performance of the String Bass in Jazz

Study of the historical development of the string bass in jazz and other related improvised musics through a selection of reading and listening projects. Practical assignments will include making transcriptions of classic records and then learning to play them on bass, employing the time-proven method of "copying the masters."

1-2 credits, ABCF grading

MUS 571 Advanced Instruction in Instrument or Voice

Individual guidance in technique and repertoire, with 30 practice hours required each week. Each student is required to perform at least one solo piece per semester, unless excused by the instructor in a written note to the department's graduate program committee.

*Fall and spring, 1-6 credits, ABCF grading
May be repeated for credit*

MUS 572 Improvisation

Practical study of the skills and sources of musical improvisation, including playfulness, emotion, courage, concentration, risk, instrumental and vocal technique, patience and trust. Improvisational skills will not be limited to any single musical style. All students will be required to improvise vocally or instrumentally.

*Fall, 1-2 credits, ABCF grading
May be repeated for credit*

MUS 573 Chamber Music

Chamber ensembles such as the string quartet, wind quintet, solo vocal ensemble, two-piano team, and other special groups meet, each under the direction of a member of the performance faculty, for the study of works from the repertoires of the respective groups, with particular attention given to the music of the 20th and 21st centuries.

*Fall and spring, 1-2 credits, ABCF grading
May be repeated for credit*

MUS 575 Master Class in Solo Repertory for Instrument or Voice

Performance techniques and problems in works for instrument or voice, drawn from all historical periods. The instructor is a teacher of the specific instrument in each case, except that his or her section may be open to students of certain other instruments with his or her permission. Not offered each semester in every instrument.

*Fall and spring, 1-2 credits, ABCF grading
May be repeated for credit*

MUS 576 Instrumental Repertoire before 1750

Exploration of instrumental repertoire in the 17th and 18th centuries.

*Spring, alternate years, 2 credits,
ABCF grading*

MUS 577 Master Class in Performance Pedagogy

Guidance and supervision in the teaching of an instrument or voice.

2 credits, ABCF grading

MUS 579 Opera Workshop

Study and performance of scenes and complete operas from the standard and 20th-century repertoires. An interdisciplinary approach involving the departments of Music and Theatre Arts.

*Fall and spring, 1-2 credits, ABCF grading
May be repeated for credit*

MUS 580 Vocal Diction

A thorough study of the rules of pronunciation and International Phonetic Alphabet transcription in a major language of the voice repertoire: Italian, French, or German. Special attention to lyric projection of the language as it relates to voice production, listener comprehension, and musical values. Course work includes coaching in appropriate song and operatic literature. The specific language studied rotates from semester to semester.

*Fall and spring, 1-2 credits, ABCF grading
May be repeated for credit*

MUS 581 Harpsichord for Pianists (Beginning)

Fundamentals of harpsichord techniques, touch, and repertoire for students already possessing a keyboard background.

Fall, alternate years, 2 credits, ABCF grading

MUS 582 Harpsichord for Pianists (Advanced)

Continuation of MUS 581: Further exploration of techniques and repertoire.

*Spring, alternate years, 2 credits,
ABCF grading*

MUS 583 Continuo Realization

Practical and theoretical instruction in figured bass realization, based on the study of vocal and instrumental scores from 1600-1750. Required of students in harpsichord. Open, with consent of the instructor, to other qualified students who have some knowledge of figured bass realization.

*Spring, alternate years, 2 credits, ABCF
grading*

MUS 584 Baroque Chamber Ensemble

Study and performance of instrumental and vocal music, 1600-1750. Participants work from scholarly editions and original sources whenever possible and have the possibility of performing on replicas of early instruments. A concert is given at the end of the class term. Acceptance by audition.

*Fall and spring, 1 credit, ABCF grading
May be repeated for credit*

MUS 585 Early Music Performance Practice

Study and implementation of Renaissance and Baroque performance practices. Areas include brass ensemble music and lute and guitar repertoires.

*Fall and spring, 2 credits, ABCF grading
May be repeated for credit*

MUS 590 Practicum in Professional Skills

Practical training in activities related to the professional work of a performing musician, including teaching, solo and ensemble performance, conducting, internships and related musical work, both on and off-campus.

Required of all full-time students in the M.M. performance program. All off-campus activities in fulfillment of this course must be approved by the Graduate Program Director, who acts as supervisor for this course.

*Fall, spring, and summer, 1-3 credits,
S/U grading*

May be repeated for credit

MUS 591 Practicum in Teaching

Instruction in the department under the supervision of the faculty. (MUS 591 may not be included in the courses taken in fulfillment of degree requirements.)

*Fall and spring, 1-3 credits, S/U grading
May be repeated for credit*

MUS 592 Seminar on the Teaching of Music

Discussion of fundamental problems in teaching music. Topics may include the explanation of musical processes; communication to non-professionals; and integration of aspects of performance, theory, history, and analysis with one another. Required of all students who teach one of the introductory undergraduate courses in musicianship, theory, or literature; to be taken during the first semester of teaching.

*Fall, 1 credit, S/U grading
May be repeated for credit*

MUS 593 Practicum in Performance

Individual instruction and/or coaching for professional performing experience.

*Fall and spring, 0-1 credit, S/U grading
May be repeated for credit*

MUS 595 Chamber Players

Specially appointed chamber groups, such as the Graduate String Quartet, the Graduate Piano Trio, etc., which work under the direction of a member of the performance faculty and present concerts and workshops at the University and elsewhere.

*Fall and spring, 3 credits, ABCF grading
May be repeated for credit*

MUS 596 Contemporary Chamber Players

The study and performance of music of the 20th and 21st centuries for ensemble, ranging from duos to larger conducted groups. Repertoire includes 20th-century classics as well as new works, including compositions written by Stony Brook students. A full schedule of public performances takes place.

*Fall and spring, 1-3 credits, ABCF grading
May be repeated for credit*

MUS 597 Jazz Ensemble

Study and performance of works for jazz ensemble.

*Prerequisites: Permission; audition required
Fall and spring, 0-1 credit, ABCF grading
May be repeated for credit*

MUS 599 Independent Studies

Individual studies under the guidance of a faculty member. Each student must submit to the graduate studies committee of the department a written prospectus of the work he or she intends to pursue, with the amount of credit proposed, together with the written endorsement of the prospective instructor. Approval of the graduate studies committee

is required; hence this material should be submitted as soon as possible, and in any case within the first two weeks of the semester (or the first week of a summer session).

0-16 credits, ABCF grading

May be repeated for credit

MUS 615 Seminar in Electronic Music Composition

Individual compositions of substantial proportions in electronic or concrete music media. The course may be repeated. Open only to qualified students in a music degree program.

Fall and spring, 3 credits, ABCF grading

MUS 623 Directed Study in Composition

Intended for doctoral students in composition.

Fall and spring, 1-12 credits, ABCF grading

May be repeated for credit

MUS 661 Directed Study in Conducting

Intended for doctoral students in conducting.

Fall and spring, 1-12 credits, ABCF grading

May be repeated for credit

MUS 671 Directed Study in Instrumental and Vocal Performance

Intended for doctoral students in instrumental and vocal performance.

Fall and spring, 1-12 credits, ABCF grading

May be repeated for credit

MUS 690 Advanced Practicum in Professional Skills

Practical training through activities related to the professional work of a performing musician, including teaching, solo and ensemble performance, internships, and related musical work, both on-campus and off-campus. Required for all full-time students in the D.M.A. performance program. All off-campus activities in fulfillment of this course must be approved by the Graduate Program Director, who acts as a supervisor for this course.

Fall, spring, and summer, 1-3 credits,

S/U grading

May be repeated for credit

MUS 695 Doctoral Essay Tutorial

Development of an essay in music history or analysis to satisfy the essay requirement of the Doctor of Musical Arts degree. Students may enroll in this course only after completing the required graduate seminars or proseminars (see program requirements) with a grade of "B" or better, in both the seminar and the essay to be developed.

Fall and spring, 1-2 credits, ABCF grading

May be repeated for credit

MUS 696 Doctoral Colloquium

Students are required to enroll in MUS 696 in the semester in which the Ph.D. colloquium or the D.M.A. lecture-recital is given. The instructor, chosen in consultation with the directing committee, acts as an advisor or tutor, and signals to the graduate program committee that the colloquium or lecture-recital may be given.

Fall and spring, 1 credit, S/U grading

MUS 697 Directed Reading

Intended for preparation for the preliminary examinations and related requirements.

Fall and spring, 1-12 credits, S/U grading

May be repeated for credit

MUS 699 Dissertation Research on Campus

Intended for work in the area of the dissertation.

Prerequisite: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab

Fall, spring, and summer, 1-12 credits,

S/U grading

May be repeated for credit

MUS 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy

(G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, and summer; Prerequisite: G5

Standing; 1-9 credits, S/U grading

May be repeated for credit

MUS 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy

(G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer; Prerequisite: G5

Standing; 1-9 credits, S/U grading

May be repeated for credit

MUS 800 Summer Research

Students who receive support for summer research must register for this course, which gives them full-time status.

S/U grading

May be repeated for credit

MUS 850 Summer Teaching

Students who receive support for summer teaching must register for this course, which gives them full-time status.

S/U grading

Neuroscience (NEU)

Chairperson: Lorne Mendell, Life Sciences Building 550 (631) 632-8616

Graduate Program Director: Gary Matthews, Life Sciences Building 550 (631) 632-8616

Graduate Administrator: Diane Godden, Life Sciences Building 550 (631) 632-8630

Degree awarded: Ph.D. in Neuroscience

The Graduate Program in Neuroscience, in the College of Arts and Sciences, offers doctoral training in the rapidly expanding field of neuroscience. Through coursework and independent research, students are trained to approach research problems in neuroscience with a broad perspective. Expertise in the areas of molecular and biochemical control of development, properties of receptors and ion channels in relation to cellular physiology, the cellular basis of integrative functions, and the structural basis for communication among neurons are available to all students in the program. Graduate students will receive in-depth research training in either molecular, biochemical, physiological, behavioral, or anatomical sciences. In addition this program offers unique opportunities to draw from one or more of these disciplines through multidisciplinary, cosponsored research projects. A program of highly interactive faculty and students provides an exciting focus for research training of graduate students.

Facilities

The program faculty are located in the Life Sciences Building, Centers for Molecular Medicine, and Health Sciences Center on the Stony Brook campus and at Brookhaven National Laboratory and the Cold Spring Harbor Laboratory. Molecular facilities provide for analysis of protein and DNA biochemistry, including microsequencing, peptide mapping, synthesis of oligonucleotides and peptides, cellular transfection, and production of transgenic animals. Wide-ranging facilities for cellular and integrative electrophysiology exist for studies on dissociated neurons, brain slice preparations, neurons in situ, and genetically engineered cells in culture. Imaging facilities permit anatomical reconstruction, fluorescence measurements, and the use of ion-sensitive indicators on both conventional and confocal microscopes. An image analysis core is linked to a scanning and transmission electron microscopy facility.

Admission

Students are expected to fulfill basic requirements of the Graduate School: a bachelor's degree from a recognized university, a grade point average corresponding to B or higher, evidence of the capacity to do satisfactory graduate work as evidenced by scores on the Graduate Record Examination (GRE), and the recommendations of three former instructors. In addition, all international students must score a minimum of 600 on the Test of English as a Foreign Language (TOEFL). The program in Neuroscience has the following additional requirements: one year of calculus, physics, and chemistry, and demonstrated proficiency in biological sciences. Deficiencies in the program requirements do not preclude admission and special consideration will be made to promising applicants.

Faculty

Distinguished Professors

Mandel, Gail, Ph.D., 1977, University of California, Los Angeles: Neuron-specific gene expression and ion channel regulation.

Mendell, Lorne M., Ph.D., 1965, Massachusetts Institute of Technology: Functional effects of neurotrophins in pain and segmental reflex pathways.

Professors

Adams, Paul R., Ph.D., 1974, University of London, England: Models of synaptic learning; neocortical design.

Brehm, Paul, Ph.D., 1975, University of California, Los Angeles: Synapse function and development in zebrafish.

Brink, Peter[†], Ph.D., 1976, University of Illinois: Electrotonic synapses.

Evinger, Leslie Craig, Ph.D., 1978, University of Washington: Motor control and learning; movement disorders.

Frohman, Michael[‡], Ph.D., M.D., 1985, University of Pennsylvania: Regulation of exocytosis and cell shape by signaling proteins.

Halegoua, Simon, Ph.D., 1978, Stony Brook University: Neuronal growth factor signaling and the control of phenotype and survival.

Levine, Joel M., Ph.D., 1980, Washington University: Molecular biology of nerve regeneration; nerve-glia interactions.

Matthews, Gary G., *Graduate Program Director*. Ph.D., 1975, University of Pennsylvania: Cellular and molecular neurobiology of the retina.

McKinnon, David, Ph.D., 1987, Australian National University: Molecular control of neuron firing properties.

McLaughlin, Stuart[†], Ph.D., 1967, University of British Columbia, Canada: Biophysics of signal transduction.

Morin, Lawrence P.[‡], Ph.D., 1974, Rutgers University: Neural control of mammalian circadian rhythms.

Yazulla, Stephen, Ph.D., 1971, University of Delaware: Synaptic circuitry of the vertebrate retina.

Associate Professors

Anderson, Brenda J.[‡], Ph.D., 1993, University of Illinois: Neuroanatomical and metabolic plasticity.

Evinger, Marian J.[‡], Ph.D., 1978, University of Washington: Neural regulation of gene expression.

Kernan, Maurice, Ph.D., 1990, University of Wisconsin: *Drosophila* mechanosensory transduction; differentiation of sensory cilia and sperm.

Khalsa, Partap S.[†], D.C., Ph.D., 1995, Worcester Polytechnic Institute; University of Massachusetts Medical School: Physiology of touch, proprioception, pain.

Kritzer, Mary, Ph.D., 1989, Yale University: Sex differences in cortical microcircuitry.

Solomon, Irene C.[†], Ph.D., 1994, University of California, Davis: Neural control of respiratory and cardiovascular function.

Tsirka, Styliani-Anna E.[‡], Ph.D., 1989, University of Thessaloniki: Neuronal-microglial interactions in the physiology and pathology of the central nervous system.

Wollmuth, Lonnie, Ph.D., 1992, University of Washington: Molecular mechanisms of synaptic transmission.

Assistant Professors

Sirotkin, Howard, Ph.D., 1996, Albert Einstein College of Medicine: Molecular genetics of vertebrate neural patterning.

Adjunct Faculty

Brody, Carlos⁶, Ph.D., 1998, California Institute of Technology: Computational systems neuroscience.

Chklovskii, Dmitri⁸, Ph.D., 1994, Massachusetts Institute of Technology: Theoretical neuroscience; principles of brain design.

Cline, Hollis⁶, Ph.D., 1985, University of California, Berkeley: Molecular control of neuronal plasticity.

Dewey, Stephen L.⁷, Ph.D., 1985, University of Iowa: Medical imaging and functional neurotransmitter interactions in substance abuse.

Enikolopov, Grigori⁸, Ph.D., 1978, Academy of Russia: Nitric oxide; neuron differentiation; survival.

Gifford, Andrew N.⁷, Ph.D., 1989, St. Andrews University, Scotland: Pharmacology of brain receptors and neurotransmitter release.

Huang, Z. Josh⁶, Ph.D., 1994, Brandeis University: Development and plasticity of the neocortical GABAergic circuits.

Mainen, Zachary⁶, Ph.D., 1995, University of California, San Diego: Neural coding and computations underlying rodent olfactory-guided behavior.

Malinow, Roberto⁶, M.D., Ph.D., 1984, New York University; University of California, Berkeley: Synaptic transmission and plasticity.

Peña, Louis, Ph.D.⁷, 1991, University of California, Los Angeles: Cellular and molecular mechanisms of radiation sensitivity.

Svoboda, Karel⁶, Ph.D., 1994, Harvard University: Synapses; neocortical circuits and their plasticity.

Thanos, Peter⁷, Ph.D., 1997, Eastern Virginia Medical School: CNS mechanisms of addiction including alcohol, drugs, and obesity.

Zador, Anthony⁶, M.D., Ph.D., 1994, Yale University: How does the cortex solve the cocktail party problem?

Zhong, Yi⁶, Ph.D., 1991, University of California, Berkeley: Molecular control of neuronal plasticity.

Number of teaching, graduate, and research assistants, fall 2005: 34

- 1) Primary appointment with Biomedical Engineering
- 2) Primary appointment with Pediatrics
- 3) Primary appointment with Pharmacology
- 4) Primary appointment with Physiology and Biophysics
- 5) Primary appointment with Psychiatry
- 6) Primary appointment with Psychology
- 7) Primary appointment with Brookhaven National Laboratory
- 8) Primary appointment with Cold Spring Harbor Laboratory

Degree Requirements**Requirements for the M.A. Degree**

The Graduate Program in Neuroscience normally does not accept a student whose goal is an M.A. degree. In exceptional instances, a student already in the graduate program may be awarded an M.A. degree upon completion of an approved course of study, including 30 graduate credit hours, a preliminary examination, a research thesis, and the minimum requirements of the Graduate School.

Requirements for the Ph.D. Degree**A. Course Requirements**

1. Core courses in neuroscience (BNB 561, BNB 562, BNB 563, BNB 564). A four-semester series taught by members of the Department of Neuroscience; the student is introduced to a broad variety of topics in neurobiology. These will be taken in the fall and spring semesters of the first and second years.

2. Laboratory Rotations in Neuroscience (BNB 555). A two-semester course in the fall and spring semesters of the first year. Students conduct research rotations in laboratories of three program members and present oral reports on their research.

3. Writing Neuroscience (BNB 551). This course is taught in the fall semester of the first year. It provides training in the basics of scientific communication, with a strong emphasis on writing and revision. Practical exercises are designed to give experience and feedback in commonly needed aspects of scientific writing.

4. Advanced Neurobiology and Behavior Seminar (BNB 697). Seminar presentations delivered by faculty, students, associates, and visiting speakers.

5. Electives. At least two additional graduate-level courses in various biological, physical, or mathematical sciences must be selected by the student in consultation with the student's advisor. Students may take additional elective courses if they desire.

B. Comprehensive Examination

At the end of the second year of study, each student must take the comprehensive examination. The examination consists of the preparation and defense of a written proposal in the area and on the topic in which the student expects to do thesis research.

C. Advancement to Candidacy

The faculty will recommend a student to the Graduate School for advancement to candidacy upon satisfactory completion of all course requirements and the comprehensive examination.

D. Ph.D. Dissertation

A dissertation that constitutes an original and significant contribution to the field of neurobiology and behavior is required for the Ph.D. The work must be of a quality acceptable for publication in a recognized scientific journal. At the end of the first year, students normally initiate a dissertation research program in the laboratory of a member of the program. After advancement to candidacy, the student and advisor will assemble an advisory committee to guide the dissertation research. Upon completion of the dissertation research, the student will present a seminar based on the dissertation. Following this the student will be given an oral examination on the dissertation research and related areas by the dissertation committee.

E. Teaching Requirements

To gain experience in teaching, the program requires that all students serve as teaching assistants during the first two years of study. Usually, TA assignments are to courses taught by the program faculty. Assignments are made to minimize impact on research productivity in the second year of study.

F. Residence Requirement

The University requires at least two consecutive semesters of full-time study. The demands of the course of study necessitate a longer period of residence.

G. Academic Standing

All students must maintain a 3.0 grade average at all times. Due to the importance of BNB 561-564 as the basis for advanced study in Neuroscience, students who have a grade of less than a B in these courses must repeat them satisfactorily prior to taking the comprehensive examination. Any student who fails to receive a grade of B or better in more than one required course will be reviewed for possible termination from the program. Research (BNB 599 and 699) is graded

on a satisfactory/unsatisfactory basis. Any student who receives a grade of U in a research course will be reviewed for possible termination from the program.

Courses

BNB 500 Directed Readings in Neurobiology and Behavior

Directed readings in topics of current interest, under supervision of a faculty sponsor, culminating in one or more critical review papers.

Annually, 1-3 credits, S/U grading

BNB 531 Advanced Neurobiology

Advanced seminar course centered around a topic to be determined. Examples include neurochemistry, membrane biophysics, neuronal plasticity, synaptic mechanisms, molecular neurobiology, developmental neurobiology. Students are expected to read original literature and deliver oral presentations of material.

Fall, 3 credits, ABCF grading

BNB 547 Readings in Neurophysiology

Discussion and critical evaluation of neurophysiological research published in biological journals. Critical analyses of techniques, methodology, and conclusions of the research provide the primary focus of this seminar.

Fall and spring, 1-3 credits, S/U grading

BNB 551 Writing Neuroscience

Seminar course for doctoral students in Neuroscience providing practical instruction in written communication in Neuroscience. Topics include writing effective abstracts, cover letters, figure captions, and grant specific aims, among others.

Prerequisite: Admission to graduate program in neuroscience or permission of instructor
1-2 credits, ABCF grading

BNB 552 Neurobiological Techniques

A series of laboratory exercises designed to give students hands-on experience in the basic laboratory techniques of contemporary neuroscience. Includes intracellular and extracellular recording, neuronal tissue culture, neuroanatomical techniques, and integrative physiology.

Prerequisite: Admission to graduate program in neuroscience or permission of instructor
Fall, every year, 2 credits, ABCF grading

BNB 555 Laboratory Rotations in Neuroscience

Seminar course for doctoral students in neuroscience in which students report the research results of their required laboratory rotations. Instruction is provided in how to organize and present material in a seminar format, including the proper use of visual aids. Enrollment restricted to students in the graduate program in neuroscience.

Prerequisite: Admission to graduate program in neuroscience or permission of instructor
1-3 credits, ABCF grading
May be repeated 2 times for credit

BNB 560 Laboratory in Neuroanatomy

This course consists of a series of laboratory exercises and supplemental lectures providing

an overview of the structural organization of the nervous system. The mammalian nervous system and its sensory, motor and cognitive components are emphasized. Laboratories include examination of whole brains and histological sections, and some hands-on experience with basic neuroanatomical techniques. Computer programs illustrating the three-dimensional and circuit organization of the human brain are also used.

Fall, 2 credits, ABCF grading

BNB 561 Introduction to Neurobiology and Behavior I

This course introduces students to basic principals of neurobiology. Topics covered include the ionic basis of resting potentials and electrical excitability, the structure, function and molecular biology of voltage- and ligand-gated ion channels, synaptic transmission, gene regulation, and developmental neurobiology.

Fall, 4 credits, ABCF grading

BNB 562 Introduction to Neurobiology and Behavior II

This is the second of a two-semester course in neurobiology and behavior. Topics covered include analyses of all of the major sensory systems, motor systems, and systems mediating higher order, cognitive functions in the nervous system.

Spring, 4 credits, ABCF grading

BNB 563 Advanced Topics in Neurobiology and Behavior I

Fall

BNB 564 Advanced Topics in Neuroscience II

Spring

BNB 579 Developmental Neurobiology

An introduction to the development of the nervous system. Topics include neuroembryology, neuronal differentiation, synapse formation, and specificity and plasticity of connections in vertebrates and invertebrates. Co-scheduled with BIO 379.

Spring, 3 credits, ABCF grading

BNB 599 Research

Original investigation undertaken with supervision of a member of the staff.

Fall and spring, 1-12 credits, S/U grading

May be repeated for credit

BNB 655 Neuropharmacology

An advanced course for graduate students interested in developing an understanding of neuropharmacology and research on this topic. Following a general introduction to the nerve cell structure, synaptic and chemical transmission, three themes receptors, receptors as channels, and G-protein-coupled receptors are developed. Recent advances in cell and molecular biology provide the framework for instruction and discussion. This course is offered as both HBH 655 and BNB 655.

Prerequisites: Permission of instructor and admission to a graduate Health Sciences Center program

Spring, even years, 3 credits, ABCF grading

BNB 697 Advanced Neurobiology and Behavior Seminar

Seminar presentations delivered by faculty, associates, students, and visiting speakers.

Fall and spring, 1 credit, S/U grading

May be repeated for credit

BNB 699 Dissertation Research on Campus

Original investigations undertaken as part of the Ph.D. program under the supervision of the dissertation committee.

Prerequisite: Must be advanced to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab
Fall, spring, and summer, 1-12 credits, S/U grading

May be repeated for credit

BNB 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

BNB 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

BNB 800 Summer Research

May be repeated for credit

School of Nursing

Dean: Dr. Lenora J. McClean, Health Sciences Center Level 2, Room 236

The School of Nursing is one of five professional schools within the Health Sciences Center. The mission of the School of Nursing is to provide accessible high quality undergraduate, graduate, and related nursing education to diverse geographically dispersed students through innovative programs that reflect current trends and promote professional growth in order to address global health care concerns. This is accomplished via on-site classes and computer-mediated distance education programs.

Two degree programs are offered: a Bachelor of Science with a major in nursing and a Master of Science. The undergraduate curriculum prepares basic baccalaureate and registered nurse students to become knowledgeable participants in the delivery of comprehensive healthcare in hospitals and other health-care agencies. The graduate program prepares students for advanced practice roles as nurse practitioners/clinical nurse specialists in adult health, primary acute and critical care, child health, perinatal/women's health/psychiatric/mental health, family health/primary care, and as nurse midwives. Principles of evidence based practice are inherent components of the educational programs.

Graduate Degrees Awarded

- M.S. in Adult Health: Primary, Acute, and Critical Care
- M.S. in Child Health
- M.S. in Nurse Midwifery
- M.S. in Perinatal/Neonatal Health
- M.S. in Perinatal/Women's Health
- M.S. in Community/Mental Health Nursing
- M.S. in Family Health/Primary Care Nursing

Advanced Graduate Certificates Awarded

- Advanced Graduate Certificate as an Adult Health Nurse Practitioner
- Advanced Graduate Certificate as a Child Health Nurse Practitioner
- Advanced Graduate Certificate as a Nurse Midwife
- Advanced Graduate Certificate as a Perinatal/Women's Health Nurse Practitioner
- Advanced Graduate Certificate as a Neonatal Nurse Practitioner
- Advanced Graduate Certificate as a Community/Mental Health Nurse Practitioner
- Advanced Graduate Certificate as a Family Health Nurse Practitioner

Master's Completion Programs

- Certified Nurse Midwives
- Certified Nurse Practitioners (may apply to a Master's Completion Program in their specialty)

Further information may be obtained from:

Kathleen Bratby, M.S.N., R.N.
Assistant Dean for Students
Stony Brook University School of Nursing
Health Sciences Center, Level 2
Stony Brook, NY 11794-8240
(631) 444-3200, Fax (631) 444-6628
www.nursing.stonybrook.edu



Oral Biology and Pathology (HDO)

Chairperson: Israel Kleinberg, Westchester Hall 195 (631) 632-8923

Graduate Program Director: Dr. Marcia Simon, Westchester Hall 105 (631) 632-8922, Fax (631) 632-9704,
E-mail: Marcia.Simon@stonybrook.edu

Graduate Program Assistant: Pritpal Kainth, Westchester Hall 109 (631) 632-8923

Degrees awarded: M.S. and Ph.D. in Oral Biology and Pathology

The Graduate Program in Oral Biology and Pathology, within the Health Sciences Center, offers a program of study and research leading to the M.S. and Ph.D. degrees. A separate track is available for dental graduates who wish to pursue a combined Ph.D.-General Dentistry or Clinical Specialty degree. Programs of study are also available to individuals with a Ph.D. or a clinical degree (dental or medical) desiring further post-doctoral research training or experience. The M.S. curriculum is of approximately two years' duration and is particularly suited for those dental graduates who wish to obtain further basic science training before entering or while obtaining a clinical specialty. The Graduate Program in Oral Biology and Pathology is also of particular interest to industrial-based scientists seeking additional training and advanced degrees. While the department is interested in all aspects of oral biology, active programs of research presently being conducted include the following: development, metabolism, and control of the oral microflora on the teeth and various epithelial surfaces including those of the mouth, skin, and vagina; oral putrefaction, malodor, and gingivitis; pathogenesis of periodontitis; interrelationship between systemic and oral diseases; mechanism and therapy of dentinal hypersensitivity; bone and salivary gland structure and metabolism; salivary gland function in normal and diseased states; secretory mechanisms; ultrastructure and metabolism of healthy and diseased periodontal tissues with an emphasis on remodeling and matrix metalloproteinases; chemistry and crystallography of the biological calcium phosphates; biology of epithelial growth and differentiation; epithelial gene therapy; biology of papillomavirus; mechanisms of epidermal and oral carcinogenesis; wound repair; sebocyte biology; biology of skin and mucosal grafting. Further details may be obtained from the graduate program director.

Facilities

The Department of Oral Biology and Pathology currently occupies 18,000 square feet of research space. Facilities include scanning and transmission electron microscopes; X-ray diffraction; isotope counters and preparative and analytical ultracentrifuges; infrared, atomic absorption, ultraviolet/visible spectrophotometers; a mass spectrophotometer; an olfactometer; gas and high-pressure liquid chromatography systems; high-voltage, particle-free flow, and polyacrylamide gel electrophoresis systems; computer equipment of various types; fluorescence densitometer, spectrophotometer, and microscopes of various types; microdensitometer; automated colony counter; amino acid analyzer; peptide synthesizer, and peptide sequencer; autoanalyzer; HPLC; 75-liter steam sterilizable fermenter; autoclaves and ethylene oxide sterilizer; tumor virus tissue culture facility; specialized anaerobic bacteriology, animal, and clinical laboratories; extensive tissue culture facilities especially for growth of keratinocytes, fibroblasts, and other cell types.

The Living Skin Bank, which supplies graft material for burn patients in the University Hospital, is housed in the Department of Oral Biology and Pathology, under the direction of Dr. Marcia Simon. Research operatories are available in the Dental Care Center for clinical research projects. Graduate students have access to the University central computer facility as well as high-speed Ethernet links connecting the department to E-mail, Medline, and the Internet through servers located in the University Hospital.

Admission

In addition to the minimum Graduate School requirements, the following are required:

A. A bachelor's degree and grade point average of 3.3 in the sciences and 3.0 overall are required for admission into either the M.S. or Ph.D. program in Oral Biology and Pathology;

B. In addition to original transcripts, applicants are required to submit three letters of recommendation and proof of satisfactory performance on the General Aptitude and Advanced parts of the Graduate Record Examination (GRE);

C. All applicants are carefully screened by the credentials committee of the department. Interviews and discussions are arranged with faculty members and graduate students where possible;

D. Formal approval for acceptance into the program is given by the Graduate School.

Faculty

Distinguished Professors

Kleinberg, Israel, *Chairperson*. D.D.S. 1952, University of Toronto, Canada; Ph.D., 1958, University of Newcastle, England: Identification of peptides and salivary factors involved in the growth and metabolism of oral mixed bacterial populations; pharmaceutical application of salivary components in the control of dental caries and oral odor; mechanisms of dental plaque formation; control of microbial populations with growth factors and growth inhibitors; new oral diagnostic techniques.

Golub, Lorne, M., D.M.D., 1963, M.Sc., 1965, University of Manitoba, Canada; Cert. Periodontics, 1968, Harvard School of Dental Medicine: Synthesis maturation and degradation of collagen in oral tissues; effect of inflammation on diabetes and collagen metabolism, on the flow and cellular and chemical constituents of gingival fluid, and relevance to diagnosis and management of the periodontal patient; therapeutic potential of tetracyclines as inhibitors of matrix metalloproteinases.

Professors

Kaufman, Hershall W., *Emeritus*. D.M.D., 1963, Ph.D., 1967, University of Manitoba, Canada: Calcium phosphate chemistry as it relates to dental hypersensitivity, dental caries, and calculus formation and prevention; rheological properties of saliva and their relation to oral health; design, management, and statistical analysis of clinical research trials.

McNamara, Thomas F., *Emeritus*. Ph.D., 1959, Catholic University of America: Microbial etiology of dental caries and periodontal disease; immune mechanisms involved in

dental pathogenesis; viral infection in oral microorganisms; significance of secretory IgA in caries prevention.

Pollock, Jerry J., *Professor Emeritus*. M.Sc. 1966, University of Toronto, Canada; Ph.D. 1969, Weizmann Institute of Science, Rehovot, Israel. Salivary host defense systems; free radicals, anti-oxidants and nutritional therapy in dental and systemic disease.

Ryan, Maria E., D.D.S., 1989, Ph.D. 1998, Stony Brook University; Cert. Periodontology, 1993, University of Connecticut: Connective tissue biology; the role of growth factors in connective tissue metabolism; diagnostic technology as it applies to preventative and therapeutic measures in dentistry; host modulatory therapies.

Simon, Marcia, *Graduate Program Director and Director of the Living Skin Bank*. Ph.D. 1981, Brandeis University: Biology and biochemistry of epithelial cornification; epithelial graft therapy for thermal injury; wound repair; connective tissue biology.

Sreebny, Leo M., *Emeritus*. D.D.S., 1945, M.S., 1950, Ph.D., 1954, University of Illinois: Studies of saliva in health and disease; relationship of salivary constituents to systemic diseases, especially Sjögren's syndrome and systematic lupus erythematosus.

Taichman, Lorne B., M.D., 1965, M.Sc., 1967, University of Toronto, Canada; Ph.D., 1971, University of Wisconsin: Biology of epithelial keratinocyte growth and differentiation; cutaneous and mucosal gene therapy; viral and nonviral methods for gene transfer; keratinocyte secretion.

Assistant Professors

Ghazizadeh, Soosan, *Assistant Professor*. Ph.D., 1994, Stony Brook University: Epithelial stem cell biology; hair follicle development; immunological responses in gene therapy; cutaneous gene therapy.

Han, Yiping Weng, M.S., 1989, University of Illinois at Urbana; Ph.D., 1993 University of Illinois at Urbana: *Fusobacterium nucleatum* in amniotic fluid infections; mechanism of preterm birth induced by *F. nucleatum*; molecular mechanism of *F. nucleatum* virulence; interactions between smoking and hematogenous infection in causing preterm birth.

Trochesset, Denise, D.D.S., 1988, University of Minnesota; Certificate of General Practice Residency, 1989, VAMC, West Haven, CT; Certificate of Oral and Maxillofacial Pathology, 2002, New York Hospital, Queens; Diplomate, 2002, The American Board of Oral and Maxillofacial Pathology: Clinical investigation of leukoplakic oral lesions; leukoplakic lesions and their relationship to alcohol and human papilloma virus.

Walker, Stephen G., M.Sc., 1987, University of Guelph, Canada; Ph.D. 1994, University of British Columbia, Canada: Analysis of the cell surface proteins and carbohydrates of *Treponema pectinovorum* and how these molecules interact with the environment

(*T. pectinovorum* is an anaerobic spirochete that flourishes in the diseased periodontal pocket of humans and may contribute to periodontitis).

Clinical and Other Adjunct Faculty

Cooper, Barry, D.D.S.

Cutler, Christopher, D.D.S.

Garant, Philiias, D.D.S.

Goren, Arthur, D.D.S.

Kittay, Irving, D.D.S.

Phelan, Joan, D.D.S.

Westbay, George, D.D.S.

Wolff, Mark, D.D.S., Ph.D.

Xu, Ling, D.D.S., Ph.D.

Research Faculty

Ramamurthy, Nungavarm S., *Professor*. M.V.Sc., 1965, University of Agra, India; Ph.D., 1970, University of Manitoba, Canada: Collagen synthesis and remodeling in health and systemic disease; leukocyte metabolism and chemotaxis in diabetes; regulation of mammalian metallo-proteinases (MMPS) and development of synthetic inhibitors for MMPS.

Degree Requirements

In addition to the minimum degree requirements of the Graduate School, the following are required:

A. All students must complete all or part of the Oral Biology and Pathology Oral Systems course. M.S. students must, in addition, complete two graduate courses selected from offerings within and outside the department. Ph.D. students are generally required to complete six course offerings at the graduate level.

B. To become a Ph.D. candidate, the student must pass an advancement-to-candidacy examination. To do this, the student must prepare a detailed written proposal in the format of a National Institutes of Health research grant application. A public seminar is presented by the student to members of his or her advisory committee, the department, and the University community at large, in which the student defends the proposal. This is followed by a further defense by the student before his or her advisory committee. A determination for advancement to candidacy is then made and forwarded to the Graduate School for official approval.

C. The candidacy examination is used to examine the student's ability to handle the intellectual and communicative processes involved in carrying out independent research.

D. An original research thesis is required for completion of both the M.S. and Ph.D. degrees. For the Ph.D. degree, the format is similar to the advancement-to-candidacy examination in that the student defends the thesis in a public seminar followed by a second examination by the student's dissertation committee. For the M.S. degree, the student defends the thesis to the student's dissertation committee. A public defense of the thesis is not required. If recommended for approval, this determination is submitted to the Graduate School, which makes the final decision to award the degree.

E. Each student has the opportunity to engage in various aspects of the teaching program of the department, and a major effort is made to assist students to attend and present papers at various scientific meetings.

Courses

HDO 500 Biology of the Oral Mineralized Tissues

This course deals with the basic chemistry, crystallography, ultrastructure, and metabolism of the calcium phosphates involved in the formation and physiological and pathological resorption of the various mineralized tissues found in or associated with the oral cavity (enamel, dentin, cementum, bone). Ectopic calculus formation will be examined.

Prerequisites: HDO 560, 561, 562, and 563 or their equivalent; admission to graduate Health Sciences Center program
Fall and spring, 3 credits, ABCF grading

HDO 510 Salivary Metabolism and Secretion

Consideration is given to the normal and abnormal structure and function of the glandular systems found in the oral cavity. The composition, regulation, and functions of the secretions from the major and minor salivary glands will receive particular attention.

Prerequisites: HDO 560, 561, 562, and 563 or their equivalent; permission of instructor; admission to graduate Health Sciences Center program
Fall and spring, 3 credits, ABCF grading

HDO 520 Oral Microbial Systems

Consideration is given to the structural composition, metabolism, and environmental relationships of the bacterial systems formed on and in association with the oral hard and soft tissues. Specific and mixed bacterial populations, such as those resident on extra-oral mucosal surfaces and the skin and their role in oral disease will be dealt with.

Prerequisite: HDO 560, 561, 562, and 563 or their equivalent; admission to graduate Health Sciences Center program
Fall and spring, 3 credits, ABCF grading

HDO 530 Molecular Biology and Pathology of the Periodontium

This course deals with the ultrastructure and biochemical composition of the periodontal tissues, remodeling of the extracellular matrix with an emphasis on the role of metalloproteinases; the microbial interrelations with the organic and inorganic components of the periodontal tissues, the biochemical dynamics of gingival inflammation and wound healing, and the metabolic processes responsible for the composition and flow of gingival crevicular fluid.

Prerequisites: HDO 560, 561, and 563 or their equivalent; admission to graduate Health Sciences Center program
Fall and spring, 3 credits, ABCF grading

HDO 535 Epithelial Keratinization and Differentiation

The course examines the growth and differentiation of stratified squamous epithelia. Particular emphasis is placed on molecular events involved in the differentiation program. Consideration is also given to mechanisms involved in cutaneous disorders.

Prerequisites: Permission of instructor; HBP 531 suggested; students must have had a background in cellular biochemistry molecular biology; admission to graduate Health Sciences Center program
Fall and spring, 3 credits, ABCF grading

HDO 545 Sugar and Man

This course examines the societal and biologic factors that influence the role played by sugar in the development of human disease. Topics include the chemistry and metabolism of sugar, the sweet taste, the place of carbohydrates in the diet, and sucrose substitutes. Special emphasis is given to the role of sugars in oral disease.

Prerequisites: HDO 560, 561, 562, and 563 or their equivalent; admission to graduate Health Sciences Center program
Fall and spring, 3 credits, ABCF grading

HDO 550 Oral Diagnostics and Therapeutic Technology, Lectures, and Laboratory Techniques

Recent advances in the use and development of research technology for the early diagnosis and treatment monitoring of oral and systemic disease. Special attention is paid to the principles of technology transfer including patents and patenting; searching of on-line databases is a key component. The course includes relationships of dry mouth to salivary physiology, diabetes, and drug medications; salivary film measurements, wetting of oral surfaces, visco-elasticity and lubricity; the use of the Periotron and enzyme assays for the diagnosis of gingivitis and periodontal disease; instrumentation used in sensitive teeth measurement and evaluation of treatment effectiveness using oral compositions and iontophoresis; oral candidiasis and denture stomatitis and early detection and causes of dental caries; oral malodor measurements including use of the Halimeter and its use in the formulation of oral compositions. Application to clinical practice and clinical studies is covered.

Prerequisites: HDO 560, 561, 562, and 563 or

their equivalent; permission of instructor; admission to graduate Health Sciences Center program

Fall and spring, 3 credits, ABCF grading

HDO 560 Oral Biology and Pathology I

The first of four comprehensive courses on molecular structure, biochemical and physiological function, developmental anatomy and pathology of the various systems that constitute the oral apparatus. Covers the embryological development of the face and oral cavity and the biology and pathology of the oral mineralized tissues.

Prerequisites: Undergraduate degree in basic science; permission of instructor; admission to graduate Health Sciences Center program

Fall and spring, 3 credits, ABCF grading

HDO 561 Oral Biology and Pathology II

The second of four comprehensive courses on molecular structure, biochemical and physiological function, developmental anatomy and pathology of the various systems that constitute the oral apparatus. Covers the biology and pathology of the periodontal structures and the microbiology of the oral cavity.

Prerequisites: Undergraduate degree in basic science; permission of instructor; admission to graduate Health Sciences Center program

Fall and spring, 3 credits, ABCF grading

HDO 562 Oral Biology and Pathology III

This course is the third of four comprehensive courses on molecular structure, biochemical and physiological function, developmental anatomy, and pathology of the various systems that constitute the oral apparatus. The course consists of the following two units of instruction: (1) the biology and pathology of the salivary glands and their products and (2) the biology and pathology of the periodontal structures.

Prerequisites: Undergraduate degree in basic science; permission of instructor; admission to graduate Health Sciences Center program

Fall and spring, 3 credits, ABCF grading

HDO 563 Oral Biology and Pathology IV

This course is the last of four comprehensive courses on molecular structure, biochemical and physiological function, developmental anatomy and pathology of the various systems that constitute the oral apparatus. Covers the biology and pathology of the oral sensory systems and the biology and pathology of oral motor systems.

Prerequisites: Undergraduate degree in basic science; permission of instructor; admission to graduate Health Sciences Center program

3 credits, ABCF grading

HDO 590 Research Projects in Oral Biology and Pathology

Individual laboratory projects closely supervised by faculty members to be carried out in their research laboratories.

Prerequisite: Enrollment in a master's or doctoral program; admission to graduate

Health Sciences Center program
3 credits, ABCF grading
May be repeated twice for credit

HDO 599 Graduate Research

Original investigations undertaken with supervision of a faculty member.

Prerequisite: Admission to graduate Health Sciences Center program
1-12 credits, ABCF grading
May be repeated five times for credit

HDO 690 Oral Biology and Pathology Seminars

Research seminars by students, staff, and visiting scientists.

Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program

Fall and spring, 1 credit, ABCF grading
May be repeated for credit

HDO 695 Oral Biology and Pathology Teaching Practicum

Practice instruction in the teaching of oral biology and pathology at the undergraduate level carried out under faculty orientation and supervision.

Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
3 credits, ABCF grading

HDO 699 Thesis Research Oral Biology and Pathology

Prerequisites: Advancement to candidacy; admission to graduate Health Sciences Center program

Fall, spring, and summer, 1-9 credits, ABCF grading
May be repeated for credit

HDO 805 Summer Research

Prerequisite: Admission to graduate Health Sciences Center program
S/U grading

Pharmacological Sciences (HBH)

Chairperson: Jeffrey Pessin, Health Sciences Center BST-8, Room 140 (631) 444-3050

Graduate Program Director: Styliana-Anna Tsirka, Health Sciences Center BST-8, Room 190 (631) 444-3859

Graduate Program Administrator: Beverly Campbell, Health Sciences Center BST-8, Room 196B (631) 444-3057; Fax: (631) 444-9749; E-mail: grad@pharm.stonybrook.edu; Web site: www.pharm.stonybrook.edu/grad

Degree awarded: Ph.D. in Molecular and Cellular Pharmacology

The faculty of the Department of Pharmacological Sciences, in conjunction with faculty in other departments at Stony Brook, offers the Graduate Program in Molecular and Cellular Pharmacology leading to the Ph.D. degree. Because the program emphasizes early research experience and provides a broad curriculum, students lay the foundation for subsequent independent research. Graduate research opportunities are provided in a broad range of areas including biochemical and molecular pharmacology, chemical pharmacology and toxicology, and cellular and physiological pharmacology. Students, in consultation with faculty advisors, pursue basic and elective courses and begin thesis research during the first two years of training. During this time, they participate in several research projects directed by faculty members associated with the program. Students then select a research advisor from the faculty and, upon completion of the qualifying exam, devote full effort to dissertation research. Students have the opportunity to perform research rotations and/or thesis research in any of 20 associated laboratories in other University departments or at Brookhaven National and Cold Spring Harbor Laboratories, in addition to laboratories in the Department of Pharmacological Sciences. Further details may be obtained from the graduate program director.

Facilities

The Department of Pharmacological Sciences is the primary training facility for graduate studies in pharmacological sciences. The department occupies 32,000 square feet in the University's Health Sciences Center and 5,000 square feet in the Graduate Chemistry Building. Faculty laboratories, including those faculty located in the recently opened Center for Molecular Medicine, are equipped for all types of modern molecular and cell biological, biochemical, neurochemical, chemical, biophysical, and toxicological research. Specialized facilities are provided for tissue culture, recombinant DNA

work, ultracentrifugation, scintillation and gamma spectrometry, transgenic mouse research, electron microscopy, confocal microscopy, molecular modeling, gas and high-performance liquid chromatography, nuclear magnetic resonance, X-ray crystallography, and mass spectrometry. Research activities are supported by various shops, University computing facilities, animal-care facilities, media services, and excellent library facilities, including include the Health Sciences Library and the Pharmacological Sciences Library. Program faculty members currently receive more than \$19 million in annual research support from federal and private agencies.

Admission

Admission to the Ph.D. Program in Pharmacological Sciences

For admission to the Graduate Program in Pharmacological Sciences, the following, in addition to the minimum Graduate School requirements, are normally required:

A. A bachelor's degree in an appropriate field (biology, chemistry, biochemistry, microbiology, physics) with evidence of superior performance in science courses. Coursework in biochemistry, physical chemistry, and physiology is desirable;

B. Three letters of reference are required;

C. Graduate Record Examination (GRE) General Test scores are required, as is the TOEFL for foreign students. One advanced test in biochemistry, biology, chemistry, computer science, physics, or mathematics is desirable;

D. Students must be accepted by both the Department of Pharmacological Sciences and the Graduate School;

E. Students accepted into the graduate program receive stipend support and full tuition scholarships. The current stipend level (2005-2006) is \$24,000 and includes health insurance coverage.

Faculty

Distinguished Professors

Grollman, Arthur P.¹, M.D., 1959, Johns Hopkins University: Chemical carcinogenesis and mutagenesis.

Mandel, Gail,¹¹ Ph.D., 1978, University of California, Los Angeles: The Control of Gene Expression in Cells of the Nervous System.

Reich, Edward, M.D., 1956, Johns Hopkins University; Ph.D., 1962, Rockefeller University: Autocrine regulation; parasite biochemistry; design of new therapeutic systems.

Leading Professor

Malbon, Craig C., *Vice Dean for Research*. Ph.D., 1976, Case Western Reserve University: Wnt-frizzled signaling via G-proteins in development; analysis of signaling complexes.

Professors

Bar-Sagi, Dafna¹⁰, Ph.D., 1984, Stony Brook University: Transmembrane signaling and growth control of cell proliferation and oncogenic transformation.

Bliska, James, Ph.D.,¹⁰ 1988, University of California, Berkeley: Molecular and cellular basis of bacterial-host cell interactions.

Bogenhagen, Daniel, M.D., 1977, Stanford University School of Medicine: Replication, transcription, and repair of mammalian mitochondrial DNA; mitochondrial proteomics.

Cohen, Ira S.¹⁴, M.D., Ph.D., 1974, New York University: Electrophysiology of the heart.

Eisenberg, Moises, Ph.D., 1972, California Institute of Technology: Application of bioinformatics tools to study comparative gene organization.

Fisher, Paul A., M.D., Ph.D., 1980, Stanford University: Structure and function of the cell nucleus; DNA metabolism and mutagenesis; human neurodegenerative diseases.

Frohman, Michael A., M.D., Ph.D., 1985, University of Pennsylvania: Neural differentiation and signal transduction.

Haltiwanger, Robert,⁷ Ph.D., 1986, Duke University: Regulation of signal transduction by glycoproteins.

Hearing, Patrick¹⁰, Ph.D., 1980, Northwestern University: Adenovirus regulation of cellular proliferation and gene expression; adenovirus vectors for human gene therapy.

Iden, Charles R., Ph.D., 1971, Johns Hopkins University: Biomedical applications of mass spectrometry; proteomics; characterization of

DNA adducts and DNA repair mechanisms; synthesis of modified oligodeoxynucleotides.

Johnson, Francis, Ph.D., 1954, University of Glasgow, Scotland: Synthesis of natural products; DoM reactions; antiviral agents; mechanism of action of carcinogens and mutagens; site-specific mutagenesis; DNA damage and mechanisms of action of DNA-repair enzymes.

Levine, Joel¹¹, Ph.D., 1980, Washington University: Glial cells; proteoglycans and the regulation of axonal growth.

McKinnon, David,¹¹ Ph.D., 1987, Australian National University, Australia: Molecular physiology of neurons and cardiac muscle.

Miller, W. Todd,¹⁴ Ph.D., 1987, Rockefeller University: Signal transduction by tyrosine kinases.

Moll, Ute M.¹², M.D., 1970, Ulm, Germany: Tumor suppressor gene research; mechanism of p53 inactivation.

Pessin, Jeffrey, William and Jane Knapp Professor and *Chair*. Ph.D., 1980, University of Illinois: Insulin regulation of vesicular trafficking and signal transduction.

Prives, Joav M., Ph.D., 1968, McGill University, Canada: Regulation of surface receptors in muscle cells.

Reich, Nancy C.¹², Ph.D., 1983, Stony Brook University: Signal transduction and gene expression induced by cytokines and viral infection.

Rigas, Basil¹, M.D. 1972; D.Sc. 1975, Athens University Medical School, Greece: NSAIDs in the prevention of colon cancer.

Said, Sami I.⁹, M.D., 1951, Cairo University, Egypt: Physiology and pharmacology of VIP and related neuropeptides, with special reference to their modulation of cell injury, inflammation, and cell death, and their potential as therapeutic agents.

Sampson, Nicole,² Ph.D., 1990, University of California, Berkeley: Integrin receptor interactions in mammalian fertilization/enzymology of cholesterol oxidase.

Schechter, Nissson¹⁵, Ph.D., 1971, Western Michigan University: Structure, function, and regulation of intermediate filament proteins and homeobox proteins during zebrafish neurogenesis.

Schmidt, Jakob⁷, M.D., 1963, University of Munich, Germany; Ph.D., 1970, University of California, Riverside: Structure, function, and regulation of nicotinic acetylcholine receptors in muscle and brain.

Setlow, Richard B.¹⁶, Ph.D., 1947, Yale University: Macroscopic effects of tumor induction.

Steigbigel, Roy¹, M.D., 1966, University of Rochester: HIV treatment and immunoreconstitution.

Tonge, Peter,² Ph.D. 1986, University of Birmingham, England: Biological chemistry and enzyme mechanisms; quantitating

substrate strain in enzyme-substrate complexes using vibrational spectroscopy; rational drug design.

Van Nostrand, William⁹, Ph.D., 1985, University of California: Cerebrovascular pathology in Alzheimer's disease and related disorders.

Volkow, Nora D.^{15,16}, M.D., 1981, National University, Mexico: Imaging studies of neuropharmacological agents; positron emission (PET) scanning.

Associate Professors

De los Santos, Carlos, Ph.D., 1987, University of Buenos Aires, Argentina: NMR solution structures of damaged nucleic acids and repair proteins.

Dewey, Stephen L.¹⁶, Ph.D., 1985, University of Iowa: Imaging neurotransmitter interactions with PET and fMRI.

Evinger, Marian J.¹³, Ph.D., 1978, University of Washington: Transcriptional regulation of PNMT gene expression; gene expression in neuronal tumors.

Kisker, Caroline F., Ph.D., 1994, Freie Universität, Berlin, Germany: Structure-function studies on DNA repair enzymes and molybdenum cofactor containing enzymes.

Kurland, Irwin¹, M.D., 1984, University of Southern California; Ph.D. 1992, Vanderbilt University: Regulation of insulin action and glucose metabolism.

Morrison, Sidonie A.¹, D.Phil., 1973, University of Oxford, England: Mechanisms of infection and pathogenesis in HIV-1 disease, especially host-cell factors; restoration of immune function during highly active antiretroviral therapy.

Simmerling, Carlos,² Ph.D., 1994, University of Illinois, Chicago: Computational chemistry and structural biology; molecular dynamics of biological macromolecules.

Schärer, Orlando, Ph.D., 1996, Harvard University: Chemical Biology of Mammalian DNA Repair.

Thomsen, Gerald H.⁷, Ph.D., 1988, Rockefeller University: Vertebrate embryonic development.

Tsirka, Styliani-Anna (Stella) E.¹⁶, Graduate Program Director, Ph.D., 1989, University of Thessaloniki, Greece: Neuronal-microglial interactions in the physiology and pathology of the central nervous system.

Wollmuth, Lonnie¹¹, Ph.D., 1992, University of Washington: Molecular mechanisms of synaptic transmission.

Assistant Professors

Colognato, Holly, Ph.D. 1999, Rutgers University: Extracellular matrix in the brain: roles during development and during neurodegeneration.

Crawford, Howard, Ph.D., 1993, University of Texas Southwestern Medical Center at Dallas: Pancreatic cancer.

Fu, Dax⁶, Ph.D., 1995, Mayo Graduate School of

Medicine: Biochemical and x-ray crystallographic studies of transmembrane active processes via membrane channels and transporters.

Karzai, Wali A.⁷, Ph.D., 1995, Johns Hopkins University: Biochemistry and structural biology of RNA-protein interactions; translational control of gene expression; drug discovery.

Maletic-Savatic, Mirjana^{18, 5}, M.D., Ph.D., 1996, University of Belgrade, Serbia and Montenegro: Mechanisms of differentiation of neural progenitor cells; identification of neuron progenitor cell biomarkers.

Nassar, Nicolas¹⁴, Ph.D., 1992, European Molecular Biology Laboratory, Grenoble, France: Regulation of signaling proteins.

Takemaru, Ken-Ichi, Ph.D., 1997, Graduate University for Advanced Studies, Japan: Wnt signaling in development and disease.

Research Faculty

Berrios, Miguel, *Associate Professor*. Ph.D., 1983, Rockefeller University: Polypeptide structure of the cell nucleus; nuclear assembly and disassembly; mapping genomic DNA damage and repair assembly and disassembly; fertilization and pronuclear formation.

Moriya, Masaaki, *Associate Professor*. Ph.D., 1981, Nagoya University, Japan: Cellular response to DNA damage.

Rosenquist, Thomas, *Assistant Professor*. Ph.D., 1989, University of Wisconsin-Madison: Genetic analysis of mammalian oxidative DNA damage repair.

Shibutani, Shinya, *Professor*. Ph.D., 1983, Toyama Medical and Pharmaceutical University, Japan: Mechanisms of translesional DNA synthesis.

Number of teaching, graduate, and research assistants, fall 2005: 35

1) Joint appointment, Department of Medicine

2) Joint appointment, Department of Chemistry

3) Joint appointment, Department of Neurobiology and Behavior

4) Joint appointment, Department of Physiology and Biophysics

5) Joint appointment, Cold Spring Harbor Laboratory

6) Joint appointment, Brookhaven National Laboratory

7) Primary appointment with Department of Biochemistry and Cell Biology

8) Primary appointment with Department of Chemistry

9) Primary appointment with Department of Medicine

10) Primary appointment with Department of Molecular Genetics and Microbiology

11) Primary appointment with Department of Neurobiology and Behavior

12) Primary appointment with Department of Pathology

13) Primary appointment with Department of Pediatrics

14) Primary appointment with Department of Physiology and Biophysics

15) Primary appointment with Department of Psychiatry

16) Primary appointment with Brookhaven National Laboratory

17) Primary appointment with Cold Spring Harbor

18) Primary appointment with Department of Neurology

Degree Requirements

Requirements for the Ph.D. Degree in Molecular and Cellular Pharmacology

In addition to the minimum Graduate School requirements, the following are required:

A. Course Requirements

1. Graduate Biochemistry (MCB 520)
2. Molecular Genetics (MCB 503)
3. Biochemical Laboratory Techniques (HBH 545)
4. Computational Methods in Biochemistry and Structural Biology (BSB 515)
5. Cell Biology (MCB 656)
6. Biomembranes (MCB 517)
7. Six one-credit special topics courses in the series Principles of Pharmacology (HBH 631-636)
8. Integrity in Science (GRD 500)
9. Proposal Preparation in Regulatory Biology (HBH 560)
10. One elective
11. Practicum in Teaching Pharmacology (HBH 601)

Depending on prior course work, students may adjust these requirements with the consent of the Steering Committee of the Graduate Program.

B. Research Rotations

Students are required to complete three rotations in laboratories affiliated with the program during the first two semesters and the following summer. The host laboratory for thesis research is typically selected from one of these three rotations.

C. Qualifying Exam

In the second year, students are required to write and orally defend a research proposal on a topic unrelated to their thesis research.

D. Thesis Proposal Examination

In the fall semester of the third year, students select a thesis committee including three program faculty and one extramural faculty member to evaluate their written thesis proposal and their oral defense of the proposal.

E. Advancement to Candidacy

Following completion of coursework, and satisfactory performance on the qualifying examination and research proposal examination, students will be recommended to the Graduate School for advancement to Ph.D. degree candidacy.

F. Ph.D. Dissertation

The research for the Ph.D. dissertation is conducted under the supervision of the thesis committee. Upon approval of the completed dissertation by this committee, a dissertation examining committee is appointed by the dean of the Graduate School. A formal public oral defense of the dissertation is scheduled, at which the student presents his or her findings and is questioned by members of the examining committee and by other members of the audience.

G. Teaching Requirement

It is expected that each graduate student completing a doctoral degree will have functioned as a teaching assistant during at least one semester of his or her graduate career (HBH 601).

H. Residence Requirement

The University requires at least two consecutive semesters of full-time graduate study. The demands of the program necessitate a longer period of residence.

Courses

HBH 501 Principles of Pharmacology

Basic principles and mechanism of drug distribution, absorption, metabolism, and elimination. Principles of chemical carcinogenesis and tumor promotion. Autonomic, Smooth Muscle and CNS Pharmacology. Pharmacology of specific drugs of historical interest including alcohol, antibiotics, aspirin, nicotine, and morphine. Review of anticoagulants and thrombolytic agents, antiparasitic, and drugs for the treatment of allergic conditions and gout. Includes discussion of specific cases taken from clinical practice and a presentation based on a set of selected readings. Crosslisted with BCP 401.

Prerequisite: Permission of instructor
Fall, every year, 4 credits, ABCF grading

HBH 502 Advanced Principles of Pharmacology

Advanced concepts of drug metabolism, pharmacokinetics, biochemical and molecular mechanisms of drug action and drug resistance in human disease states. Toxicological agents and environmental pollutants. The pharmacology of autocoids, anti-inflammatories, immunosuppressants, and anti-asthmatics. Rational drug design and drug receptor interactions using computer molecular modeling techniques. Includes discussion of specific cases taken from clinical practice and a

presentation based on a set of selected readings. Crosslisted with BCP 402.

Spring, every year,
4 credits, ABCF grading

HBH 510 Pharmacology: Principles & Practice

Introduces the basic principles of pharmacology and covers drugs with action in the autonomic and central nervous systems. Includes the discussion of specific cases taken from the clinical practice.

Prerequisite: Open only to students enrolled in the Physician Assistant Graduate Program.

Fall, every year, 2 credits, ABCF grading

HBH 511 Pharmacology: Principles & Practice

Continuation of HBH 510. Covers the action of drugs acting in the cardiovascular, respiratory, gastrointestinal, renal, and endocrine systems, as well as anticoagulant, anti-inflammatory, anti-microbial, and anticancer agents. Includes the discussion of specific cases taken from the clinical practice.

Prerequisite: HBH 510; Admission to Physician Assistant Graduate Program
4 credits, ABCF grading

HBH 531 Principles of Medical Pharmacology

Basic principles that underlie actions of drugs on physiological processes with particular reference to their therapeutic and toxic actions. For medical and dental students.

Prerequisites: Physiology, biochemistry, permission of instructor, admission to graduate Health Sciences Center program
Modules 4-6, 5 credits, ABCF grading

HBH 545 Biochemical Laboratory Techniques

Introduces theoretical principles and experimental techniques used in modern biochemical research. Lectures and demonstrations present topics in laboratory computers, chromatography, nuclear magnetic resonance, mass spectrometry, protein sequencing, cloning technology, sedimentation, electrophoresis, and ligand binding. Includes procedures for the safe handling of toxic chemicals and radioisotopes.

Prerequisites: Permission of instructor, admission to graduate Health Sciences Center program
Spring, 2 credits, ABCF grading

HBH 553 Signal Transduction

The course will emphasize fundamental concepts in signal transduction (e.g., membraneprotein and protein-protein interactions, amplification of signals), and individual lectures will apply these concepts at each stage of cell signalling from the cell surface to the nucleus, where signal transduction leads to specific gene expression. Crosslisted with HBH 553 or HBH 553.

Prerequisites: Permission of instructor,
Spring odd years, 3 credits, ABCF grading

HBH 560 Proposal Preparation in Regulatory Biology

A literature-based course focusing on major research areas in molecular and biochemical

pharmacology. The first part of the course will expose students to a series of examples of recent grant proposals. The second part of the course will feature student presentations of their research proposals.

*Due to the coordination of this course with the Qualifying Exam, registration is limited to pharmacology program students.
Spring, 2 credits, ABCF grading*

HBH 580 Selected Topics in Pharmacology

Student seminars and readings on topics arranged through consultation with staff.

*Prerequisites: Permission of instructor, full-time pharmacology graduate status;
Fall and spring, 1 credit, ABCF grading
May be repeated for credit*

HBH 590 Pharmacology Seminars

Advanced research seminars by staff and visiting lecturers.

*Prerequisites: Permission of instructor, full-time pharmacology graduate status
Fall and spring, 1 credit, S/U grading*

HBH 599 Graduate Research in Pharmacological Sciences

Original research projects under faculty supervision.

*Prerequisites: Permission of instructor, full-time pharmacology graduate status
Fall, spring, and summer, 1-12 credits, ABCF grading
May be repeated for credit*

HBH 601 Practicum in Teaching Pharmacology

Practical experience and instruction in the teaching of pharmacology carried out under faculty orientation and supervision.

*Prerequisites: Permission of instructor, full-time pharmacology graduate status
Fall and spring, 1 credit, ABCF grading
May be repeated 5 times for credit*

HBH 631 Principles of Drug Action

This course is designed to provide a quantitative understanding of the basic principles by which drugs interact with living systems at the cellular and organismal levels. Topics include the mechanisms of drug transport through membranes, interaction of drugs with receptors and binding proteins, drug distribution, biotransformation of drugs, enzymes of stage I and stage II metabolism, cytochrome p450 gene families and regulation of p450 gene expression, mechanisms of renal excretion of drugs and metabolites, pharmacokinetics of constant drug infusions and intermittent dosing regimens, and applications of pharmacokinetic principles to protein and mRNA induction and turnover. Students apply pharmacological principles in a series of problem solving exercises.

Fall or spring, 1 credit, ABCF grading

HBH 632 Molecular Interactions of Drug Structures

The course provides an overview of the most current approaches to analyze and understand the interactions between a drug and its target and how this information is used for the design and development of new drugs. The detailed structural analysis of drug target interactions

by X-ray crystallography and NMR spectroscopy as a basis for the design of new drugs will be discussed on the basis of very recent examples. Advanced computer simulation techniques will be discussed and will include the use of molecular mechanics energy functions to optimize biomolecular structures, predict ligand binding modes and energetics.

Fall or spring, 1 credit, ABCF grading

HBH 633 Physiological Action of Drugs

Selected applications of drugs used in clinical medicine, illustrating current concepts and problems at the intersection of pharmacological basic science and therapeutic treatment. Settings to include the management of diabetes, metabolic diseases, and cardiac disease.

Fall or spring, 1 credit, ABCF grading

HBH 634 Chemical Manipulation of DNA Metabolism

This course will focus on human DNA metabolism and specifically DNA replication. Current models will be discussed including theoretical mechanisms by which drugs may work and specific chemical intervention strategies will be presented, theoretically as well as practically.

Fall or spring, 1 credit, ABCF grading

HBH 635 New Concepts in Chemotherapy

This course compares mechanisms of action of drugs used for antibacterial and anti-cancer chemotherapy. The lecture material stresses how selective toxicity is achieved in each case with either cell death or inhibition of cell growth as the ultimate mechanism. Original research papers are discussed on mechanisms whereby cells develop resistance to chemotherapy and novel strategies to overcome this resistance.

Fall, 1 credit, ABCF grading

HBH 636 Drug Discovery and Drug Interactions

An advanced series of lectures and student presentations will develop a basic understanding of modern methods of drug discovery and drug receptor interactions. Topics include the structural and physiological factors essential for drug action, quantitative structure activity relationships, and unintended toxicities produced by drug substances.

Fall, 1 credit, ABCF grading

HBH 655 Neuropharmacology

An advanced course for graduate students interested in developing an understanding of neuropharmacology and research on this topic. Following a general introduction to the nerve cell structure, synaptic and chemical transmission, three themes receptors, receptors as channels, and G-protein-coupled receptors are developed. Recent advances in cell and molecular biology provide the framework for instruction and discussion. This course is offered as both HBH 655 and BNB 655.

Spring, even years, 3 credits, ABCF grading

HBH 699 Dissertation Research in Campus

Original investigation undertaken as part of the Ph.D. program under supervision of thesis adviser and committee.

Prerequisite: Advancement to candidacy

*(G5); permission of thesis advisor; major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab; full-time pharmacology graduate status
Fall, spring, and summer, 1-9 credits, S/U grading*

May be repeated for credit

HBH 700 Dissertation Research off Campus-Domestic

Prerequisite: Must be advanced to candidacy (G5). Major portion of research will take place off-campus, but in the United States and/or U.S. provinces. Please note, Brookhaven National Labs and the Cold Spring Harbor Lab are considered on-campus. All international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor; full-time pharmacology graduate status

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

HBH 701 Dissertation Research off Campus-International

Prerequisite: Must be advanced to candidacy (G5). Major portion of research will take place outside of the United States and/or U.S. provinces. Domestic students have the option of the health plan and may also enroll in MEDEX. International students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed. International students who are not in their home country are charged for the mandatory health insurance. If they are to be covered by another insurance plan they must file a waiver be second week of classes. The charge will only be removed if other plan is deemed comparable. All international students must receive clearance from an International Advisor; full-time pharmacology graduate status

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

HBH 800 Full-Time Summer Research

Full-time laboratory research projects supervised by staff members.

*Prerequisites: Permission of instructor, full-time pharmacology graduate status
S/U grading*

Philosophy (PHI)

Chairperson: Lorenzo Simpson, Harriman Hall 209 (631) 632-7585

Graduate Program Director: Donn Welton, Harriman Hall 216 (631) 632-7524

Graduate Program Coordinator: Anna Brewer, Harriman Hall 207 (631) 632-7580

Administrative Assistant: Alissa Betz, Harriman Hall 213 (631) 632-7590

Degree awarded: M.A. in Philosophy; Ph.D. in Philosophy

The Department of Philosophy, in the College of Arts and Sciences, offers programs leading to the Master of Arts in Philosophy and to the Doctor of Philosophy.

The doctoral program offers a rare opportunity to integrate the study of the history of philosophy with an exploration of contemporary philosophical methods and to apply an interdisciplinary approach to the framing and treatment of philosophical problems. The Philosophy Department is the sponsor of a Transatlantic Philosophical Collegium that offers advanced students opportunity for extended study at the University of Wuppertal. Departmentally based, funded exchanges with the University of Tübingen and the University of Paris give students further opportunity to study abroad.

There are three general aims of the doctoral program:

1. To cultivate and make explicit the values and principles of the principal contemporary styles of philosophical reasoning;

2. To investigate the areas between philosophy and other disciplines that involve methodological, conceptual, and historical exchanges between philosophy and these other disciplines;

3. To provide an understanding of the history, major figures, and diverse problems of philosophy.

Admission to the Ph.D. Program in Philosophy

For admission to the doctoral program in philosophy, the following are normally required:

A. A bachelor's degree with a major in philosophy;

B. Some knowledge of the history of philosophy and of contemporary modes of thought is highly desirable; deficiencies in these areas may require the student to undertake special work;

C. An official transcript of undergraduate record and of any work completed at the graduate level;

D. Letters of recommendation from three previous or current instructors;

E. Submission of a philosophical essay (which may be a paper written for a previous course);

F. Graduate Record Examination (GRE) General Test scores;

G. Acceptance by both the Department of Philosophy and the Graduate School.

Faculty

Distinguished Professors

Casey, Edward S., Ph.D., 1967, Northwestern University: Aesthetics; phenomenology; philosophy of psychology.

Howard, Richard, Ph.D., 1970, University of Texas: Political and social philosophy; Marxism.

Ihde, Don, *Graduate Program Director*. Ph.D., 1964, Boston University: Phenomenology; philosophy of technology; hermeneutics.

Distinguished Service Professor

Gelber, Sidney, *Emeritus*. Ph.D., 1954, Columbia University: Political philosophy.

Distinguished Teaching Professor

Grim, Patrick⁷, B. Phil., 1975, University of St. Andrews, Scotland; Ph.D., 1976, Boston University: Logic; ethics; computer modeling; contemporary analytic philosophy.

Professors

Allison, David B., Ph.D., 1974, Pennsylvania State University: Contemporary European philosophy.

Crease, Robert, Ph.D., 1987, Columbia University: Philosophy of science; aesthetics.

Dilworth, David, Ph.D., 1963, Fordham University; Ph.D., 1970, Columbia University: East Asian languages and cultures.

Kittay, Eva, Ph.D., 1978, City University of New York: Philosophy of language; philosophy and literature; feminism.

Kuspit, Donald B.¹, D.Phil., 1960, University of Frankfurt, Germany; Ph.D., 1971, University of Michigan: Art criticism; 20th-century art; northern Renaissance art.

Miller, Clyde Lee⁶, Ph.D., 1974, Yale University: History of philosophy.

Nolan, Rita D., Ph.D., 1965, University of Pennsylvania: Philosophy of language; theory of knowledge; philosophy of psychology.

Silverman, Hugh J.²⁴, Ph.D., 1973, Stanford University: Continental philosophy (hermeneutics, deconstruction, and postmodern theory); aesthetics and cultural theory; contemporary European philosophies, literatures, and cultures; history of ideas; literary theory.

Simon, Michael A., *Emeritus*. Ph.D., 1967, Harvard University: Social philosophy; philosophy of biological and social science; philosophy of mind; philosophy of law.

Simpson, Lorenzo⁹, *Chairperson*. Ph.D., Yale University: Contemporary continental philosophy (hermeneutics and critical theory); philosophy of the social sciences; philosophy of science and technology; neopragmatism and post-analytic philosophy; philosophy and race.

Spector, Marshall, Ph.D., 1963, Johns Hopkins University: Philosophy of science; philosophy of technology; environmental issues.

Tejera, Victorino, *Emeritus*. Ph.D., 1956, Columbia University: Aesthetics; classical philosophy.

Watson, Walter, *Emeritus*. Ph.D., 1958, University of Chicago: History of philosophy.

Welton, Donn,¹⁰ Ph.D., 1973, Southern Illinois University: Phenomenology and epistemology; philosophical psychology. Contemporary German philosophy.

Williams, Peter^{3,5}, Ph.D., 1973, Harvard University: Philosophy of law; ethics.

Associate Professors

Cormier, Harvey, J. Ph.D., Harvard University: American philosophy; William James and pragmatism; philosophy and culture.

Edwards, Jeffrey, B. Ph.D., 1987, Universität Marburg, Germany: History of philosophy; Kant; modern philosophy.

Manchester, Peter², Ph.D., 1972, Graduate Theological Union: Greek philosophy; Heidegger.

Mar, Gary⁸, Ph.D., 1985, University of California, Los Angeles: Logic; philosophy of mathematics; contemporary analytic philosophy; philosophy of religion.

Mendieta, Eduardo, Ph.D., 1996, New School for Social Research: Latin American philosophy; critical theory.

Rawlinson, Mary C., Ph.D., 1978, Northwestern University: 19th-century philosophy; Hegel; aesthetics and literary theory; philosophical psychology; philosophy of medicine.

Assistant Professor

De Laurentis, Allegra, Ph.D., 1982, University of Frankfurt: Greek philosophy; Hegel.

Number of teaching, graduate, and research assistants, fall 2005: 40

- 1) Joint appointment, Department of Art
- 2) Joint appointment, Department of Comparative Studies
- 3) Joint appointment, Community and Preventive Medicine
- 4) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1977
- 5) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1978
- 6) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1980
- 7) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1988
- 8) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1993
- 9) Recipient of the Commonwealth of Virginia's Outstanding Faculty Award, 1990; University of Richmond's Distinguished Educator Award, 1984
- 10) Recipient of President's and Chancellor's Award for Excellence in Scholarship and Creative Activity, 2005.

Degree Requirements

Requirements for the Ph.D. Degree in Philosophy

The doctoral program is designed to be completed in five years of full-time work. The Graduate School regulations prescribe a minimum of two semesters of full-time enrollment. In addition to the minimum degree requirements of the Graduate School, the following are required:

A. Seminars

Seminar coursework will be required from the following three areas: history of philosophy, interface studies, and contemporary philosophy. Each of the three areas has a minimum number of required courses. The student will also take at least two additional seminars in one of the three areas to fulfill the concentration of studies requirement.

1. Three seminars in the history of philosophy from four groups of courses concentrating on ancient philosophy, medieval/Renaissance philosophy, modern philosophy, and 19th-century philosophy. These courses will feature an intensive writing component. For those students wishing to pursue a concentration of studies in the history of philosophy, a minimum of two additional courses may be taken from these areas or from seminar studies directed to special topics in the history of philosophy (which draw upon specific

authors, texts, themes, or problems from the history of philosophy).

2. Two interface seminars in interdisciplinary areas between philosophy and another discipline pertaining to the natural sciences, to the social sciences, or to the humanities. This requirement may be met either by taking interdisciplinary seminars team-taught by philosophy faculty with faculty from another discipline or by taking regular graduate courses in another discipline. Two additional courses from this category may be taken to fulfill concentration requirements.

3. Five seminars in contemporary philosophy are required. Two seminars in the preeminent styles or modes of philosophy are required: one in continental philosophy (PHI 630) and one in analytic philosophy (PHI 631). These two seminars will explore the methods, presuppositions, and operational modes of the contemporary philosophy involved. Two additional seminars, chosen from a list of subjects, must be taken to fulfill the basic requirement. Two more seminars from the contemporary category may be taken to fulfill concentration requirements.

4. A practicum in the teaching of philosophy. This involves a supervised teaching seminar, along with additional teaching experience in the undergraduate program.

5. A prospectus seminar taken in the spring semester of the third year. The primary goal will be to produce a dissertation proposal.

6. An overall average grade of B or better is required, with no more than six credits of B grades counting toward the degree.

B. General Requirements

1. The student must pass an examination in the history of philosophy. Although the student may take the exam any number of times prior to the deadline, the examination must be passed by the end of the second year. The history of philosophy examination is constructed and read by the faculty History of Philosophy Committee.

2. The student must submit an essay, judged acceptable by a committee, in one of the areas of contemporary philosophy.

3. The student must submit an essay, judged acceptable by a committee com-

posed of at least one Philosophy faculty member and a faculty member from the relevant second discipline, in one area of interface studies.

General reviews of student progress based upon a portfolio (courses taken, courses completed, grades, faculty evaluations of seminar work, sample papers, teaching evaluations, and performance in the above general requirements) will be undertaken at the end of the first and third years and in the second year after the deadline for passing the history of philosophy examination. The second-year review is the milestone requirement of the program. These reviews will assess the progress of students and determine qualifications for continuance or noncontinuance in the program.

The graduate program director will guide students in planning their program of studies to assure that general requirements are completed prior to their advancement to candidacy.

C. Ph.D. Candidacy

Official Ph.D. candidacy is attained when, in addition to the requirements listed above, a student fulfills the following competency requirements:

1. Competence in symbolic logic. Sufficient knowledge of concepts and notations of first-order logic for understanding and applying them to problems in philosophy. A grade of B or better in an undergraduate symbolic logic course is normally adequate evidence of competence.

2. Competence in a foreign language. This is shown by translating a previously untranslated philosophical article (or the equivalent) or by writing a research paper including a translation of substantial philosophical passages.

3. Competence to undertake a dissertation project. This is shown by (a) a prospectus (10-15 pages) outlining projected study, expected findings, and relevant arguments and evidence (e.g., bibliography), and (b) an oral defense of the projected study before a faculty examining committee.

Upon the recommendation of the examining committee and the graduate program director that the dissertation project be initiated, the student becomes a candidate for the Ph.D.

D. Dissertation

After advancement to candidacy, the student will concentrate on a dissertation (the written results of specialized study and research) under the supervision of a dissertation committee. After the dissertation is completed, it is read by a committee of four members, consisting of the director, two other members of the philosophy faculty, and one faculty member from outside the department who has specialized in related areas. Before final approval can be granted, the student must present the results of the dissertation research at an oral examination convened for that purpose by the department and open to interested faculty members and graduate students. If the dissertation defense is successful, the candidate is recommended to the University for the Doctor of Philosophy degree.

M.A. Degree Requirement

Doctoral students or M.A. students may be awarded the M. A. degree upon completion of the minimum coursework offerings for a total of 30 graduate credits of coursework, 6 of these credits can be devoted to a master's thesis essay judged acceptable by at least two faculty members approved by the graduate program director. No more than six credits of independent study and six credits taken outside of the Philosophy Department at Stony Brook can count toward the master's degree.

Courses

Detailed course descriptions for the doctoral program are available from the Philosophy Department office each semester. Please refer to the current undergraduate and Graduate Class Schedules for specific semester offerings.

Courses

PHI 500 Feminist Theories

This course is designed to introduce students to the most recent developments in feminist theory, covering different currents as well as traditions. The seminar may focus on moral and political questions, the intersection between the social and the psychological, or culture and representation as it is negotiated in different cultural media (film, literature, architecture, music, etc.).

*Spring, 3 credits, ABCF grading
May be repeated for credit*

PHI 501 Theories of Race

This course is designed to introduce the student to different currents of analyses of race and racism. It focuses particularly on the relationship between philosophy and the

development, legitimacy and legitimation of racial categories. The seminar may focus on moral and political philosophy, questions of epistemology or metaphysics, the intersections between the social and the psychological, or culture and representations of raced subjects as they are negotiated in different cultural media (film, literature, architecture, music, etc.).

*Fall, 3 credits, ABCF grading
May be repeated for credit*

PHI 503 Theories of Ethnicity

This course focuses on the category of ethnicity. Using an inter-cultural, comparative and historical approach, it seeks to expose the student to the uses and misuses of this category. The category of ethnicity will also be studied in conjunctions with questions relating to individual identity, national, cultural and civilizational identities. Ethnicity, like race and gender, is one of the most fundamental markers of identity. Using interdisciplinary and comparative methods and perspectives, ethnicity's role in the constitutions of identities will be studied.

*Fall, 3 credits, ABCF grading
May be repeated for credit*

PHI 504 Intersections of Race, Ethnicity, and Gender

This course, which is analogous to an honors senior seminar, seeks to integrate into a productive dialogue the different methods, traditions and perspectives used to analyze race, ethnicity, and gender, while also juxtaposing and comparing the similarities and differences between them. The approach, as in the whole program, will be interdisciplinary and comparative.

*Fall, 3 credits, ABCF grading
May be repeated for credit*

PHI 505 Core Course in Philosophy and the Arts: History of Aesthetic Theory

The basic course will investigate some of the most important and influential theories of art in the West from Plato to the present. Readings and discussion in depth of major figures will make up the content of the course: e.g., Plato, Aristotle, Kant, Hegel, Schopenhauer, Nietzsche, Heidegger, Collingwood, Langer, Merleau-Ponty, Dufrenne. The focus throughout will be on central issues in aesthetics such as imitation, truth, beauty, expression, emotion, and imagination.

*Fall, and spring, every year, 3 credits,
ABCF grading*

PHI 506 Art and Its Problems

A consideration of basic problems in the creation and appreciation of art. What is the creative process? Who is the artist? How is art to be compared with other symbolic forms (e.g., language, science, technology)? What does art offer that philosophy does not, and vice-versa? In what ways does the gender or racial identity of the artist affect the creation of the work? What are the cultural, social and political dimensions of the art work and its reception?

*3 credits, ABCF grading
May be repeated for credit*

PHI 507 Aesthetic System

A concentrated reading of a single major work, (or at least two such works), with careful attention both to its detailed content and claims as well as its larger significance for art and philosophy. Candidates for such works include: Aristotle's *Poetics*, Kant's *Critique of Judgement*, Hegel's lectures on "The Philosophy of the Fine Arts," Langer's *Feeling and Form*, Adorno's *Aesthetic Theory*, Collingwood's *Principles of Art*, Dufrenne's *Phenomenology of Aesthetic Experience*, Heidegger's "Origin of the Work of Art" (and other essays, and Danto's *Transfiguration of the Commonplace*.)

*Fall, every year, 3 credits, ABCF grading
May be repeated for credit*

PHI 508 Contemporary Issues in the Arts

With an eye on artworks accessible in the public sphere—museums, galleries, concerts, readings, dance performances, film—philosophical questions will be raised: Why these works now? How do they compare with their predecessors? What do they portend for the future of art? Visits to the sites and performances of such works will be integrated into an ongoing discussion of the issues they raise within the context of aesthetic theory—and what new theories they suggest.

*3 credits, ABCF grading
May be repeated for credit*

PHI 509 Special Seminar in Aesthetics

This is an advanced seminar in aesthetics that focuses on a single question that arises in the philosophy of art. This question may be approached through the writings of a single author, or else by consulting texts of several thinkers (including practicing artists as well as philosophers). Examples of such questions would be: What is the place of form in art? What is the character of artistic beauty? What is the role of imagination in art? How does emotion figure into the creation or appreciation of art? To be taught on the main campus by a regular faculty member. Ideally, this course would be taken during the second year of master's degree work at Stony Brook Manhattan.

PHI 521 Contemporary Moral Issues

This examination of the radical nature of traditional moral theory in its contemporary applications will look at the ideas of Mill, Kant, and Aristotle as variations on traditional Judeo-Christian moral theory. Students will write short papers on contemporary moral issues as these are portrayed in short fiction.

3 credits, ABCF grading

PHI 535 Political Philosophy

This course will take up classics of political philosophy and discuss contemporary social life and ideologies in the light of the theoretical frameworks they have achieved. Readings and assignments will be drawn from such exemplary works as Plato's *Republic*, Aristotle's *Politics*, Machiavelli's *The Prince*, Hobbes's *Leviathan*, Locke's *Second Treatise of Government*, and Marx's *Communist Manifesto*.

3 credits, ABCF grading

PHI 551 Life Histories

The purpose of this course is to develop the skills for conducting oral histories, interviews, and constructing family albums as a tool for classroom enrichment. Oral histories help students to place themselves in history and empower them to become active agents in history. This course will focus on reclaiming a rightful place in history; resolving inter-generational misunderstandings and conflicts; giving voices back to the silenced; giving voices to a shamed generation; and claiming back one's identity. The course will illustrate these tools using the history of Asians in the Americas. This course is offered as both CEI 576 and PHI 551.

3 credits, ABCF grading

PHI 553 Philosophy of Education

The purpose of the course is to develop curricula which not only bridge educational gaps but which also develop within all students a sense of civil responsibility toward community issues and problems. This course critically examines such issues of ethnicity and race, family systems, affirmative action, and multiculturalism through the vehicle of Asian American studies.

3 credits, ABCF grading

PHI 555 Perspectives on the Person

The focus of this course will be the question of how the results of current research are related to our understanding of human development and whether they require us to revise our understanding of what a person is. Readings from classic philosophical texts, such as Plato, Locke, Kant, and from contemporary research in philosophy, psychology and other relevant sciences will be used. Offered as both CEI 587 and PHI 555

3 credits, ABCF grading

PHI 571 American Philosophy: Philosophical Foundations of American Politics

Readings from Emerson, C.S. Peirce, G.H. Mead, W. James, G. Santayana, J. Dewey, J.H. Randall, and J. Buchler will give the student a grasp of the classic American tradition in philosophy and the plural strands that go to make it up, such as: the turn from idealism to semioticism, neo-realism and critical realism, pragmatism and pragmatism, the historical interest and the social interest, individualism and voluntarism, and the centrality of art and science in human affairs.

3 credits, ABCF grading

PHI 572 Oriental Philosophy**PHI 575 Philosophy of Religion**

Several aspects of the Judeo-Christian tradition raise philosophical questions worthy of further reflection and consideration. The first is the relation of religious faith to other sorts of knowledge and commitment: is religious belief more like belief in scientific experts or more like belief in one's spouse? A second is what sort of God is worth believing in and whether we can talk intelligibly about the deity. The third is whether and how any God worth believing in could be compatible with the obvious ills of our world. Note: Ability to read and write material that is abstract and complex, but rewarding.

3 credits, ABCF grading

PHI 576 Ethics and Values**PHI 582 Philosophy of Art**

The purpose of this course is to encourage students to explore and enrich their aesthetic experience through reading, analyzing, discussing, and writing about various theories put forth by philosophers in the western tradition. Among topics to be considered are representation, expression, form, the aesthetic attitude, beauty, taste, criticism and interpretation of art, and the relation of art to other areas of experience. The course does not assume previous familiarity with philosophy or art; however, it does assume an intellectual commitment to the examination of difficult ideas. This course is offered as both CEI 573 and PHI 582.

3 credits, ABCF grading

PHI 587 Directed Readings**PHI 588 Directed Research****PHI 590 Directed Readings****PHI 595 Directed Research****PHI 599 Master's Thesis Research**

May be repeated 2 times for credit

History of Philosophy Seminars**PHI 600 Ancient Philosophy****PHI 601 Medieval and/or Renaissance Philosophy****PHI 602 Modern Philosophy****PHI 603 19th-Century Philosophy****PHI 604 Special Topics in the History of Philosophy**

May be repeated for credit

Interface Seminars**PHI 610 Philosophy and the Arts****PHI 611 Philosophy and Literature****PHI 612 Philosophy and Psychology****PHI 613 Philosophy and Politics****PHI 614 Philosophy and Linguistics****PHI 615 Philosophy and Feminism****PHI 616 Philosophy and Technology****PHI 617 Philosophy and Environmental Studies****PHI 618 Philosophy and the Sciences****PHI 619 Special Topics in Interface Studies**

May be repeated for credit

Advanced Problems**PHI 620 Advanced Problems in Philosophy**

*3 credits, ABCF grading
Variable and repetitive credit*

PHI 621 Independent Study

*May be repeated for credit
S/U grading*

PHI 622 Supervised Teaching**PHI 623 Teaching Practicum****PHI 624 New York Consortium Study**

This course designation should be used by students who enroll in seminars at participating universities of the New York Consortium of Graduate Schools. No more than six credits of consortium study (and none for first-year students at Stony Brook) may count toward the fulfillment of requirements in the doctoral program.

Fall, 1-4 credits, ABCF grading

PHI 625 Prospectus Seminar

This seminar is taken by all doctoral students in the spring semester of their third year. The primary goal is to have each write a dissertation proposal. The structure of the seminar will be worked out with the students and the faculty member leading seminar.

Spring, 3 credits, S/U grading

Contemporary Seminars**PHI 630 Seminar in Continental Philosophy****PHI 631 Seminar in Analytic Philosophy****PHI 632 Seminar in Comparative Philosophy****PHI 633 American Pragmatism and Naturalism****PHI 634 Eastern Philosophy****PHI 635 Philosophy of Science and Logic****PHI 636 Metaphysics****PHI 637 Epistemology****PHI 638 Philosophical Psychology****PHI 639 Social and Political Philosophy****PHI 640 Ethics****PHI 641 Aesthetics****PHI 642 Philosophy of Religion****PHI 643 Semiotics****PHI 644 Special Topics in Contemporary Philosophy**

May be repeated for credit

Dissertation Research

PHI 699 Dissertation Research on Campus

Prerequisite: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab Fall, spring, and summer, 1-12 credits, S/U grading

May be repeated for credit

PHI 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

PHI 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

PHI 800 Full-Time Summer Research

0 credits, S/U grading



Physics and Astronomy (PHY)

Chairperson: Peter Koch, Physics Building P-110 (631) 632-8100

Graduate Program Director: Laszlo Mihaly, Physics Building P-107 (631) 632-8279

Assistant Graduate Program Director: Pat Peilliker, Physics Building P-106 (631) 632-8080

Degrees awarded: M.A. in Physics; M.S. in Physics in Scientific Instrumentation; Ph.D. in Physics

The Department of Physics and Astronomy, in the College of Arts and Sciences, offers courses of study and research that normally lead to the Ph.D. degree. A Master of Science in Scientific Instrumentation program is provided for those interested in instrumentation for physical research. A Master of Arts program is available for students seeking an advanced education in physics or physics teaching.

Physics research is conducted in the areas of particle, nuclear, condensed matter, mesoscopic, and atomic, molecular, and optical physics on campus and at research facilities elsewhere. Brookhaven National Laboratory (BNL), located only 20 miles away, offers many unique research opportunities. A number of institutes dedicated to specific fields of research are associated with the department. The C. N. Yang Institute for Theoretical Physics focuses on research in fundamental theory such as particle theory, neutrino physics, string theory, supersymmetry, and statistical mechanics. The Nuclear Theory Institute works on the theory of non-perturbative quantum chromodynamics and the properties of hadronic matter. The Stony Brook Radiation Laboratory supports experimental research in nuclear and high-energy physics. The Nuclear Physics Group operates a superconducting linear accelerator for nuclear physics research on campus. The Institute for Interface Phenomena concentrates on research in device-oriented solid-state physics based on superconductors and semiconductors. The Institute for Terrestrial and Planetary Atmospheres offers a program in atmospheric physics. The Center for Environmental Molecular Sciences enables study of biological and environmental problems. Faculty and staff make use of many off-campus facilities including the Relativistic Heavy Ion Collider at BNL, the Fermilab Tevatron Collider, the Large Hadron Collider at CERN, neutrino facilities in Japan, the Center for Functional Nanomaterials at BNL, and synchrotron light sources at BNL, Argonne National

Laboratory, and Lawrence Berkeley National Laboratory. Astronomical research is conducted on both theoretical and observational topics. The group uses DOE supercomputing facilities, as well as an on-site Beowulf cluster, for extensive simulations of astronomical objects and nuclear astrophysical processes. Observational research investigates extragalactic and cosmological parameters, molecular clouds, stellar properties, star formation regions, and neutron stars. Stony Brook is a member of the SMARTS consortium that operates a set of telescopes at Cerro Tololo in Chile. Faculty and students are also frequent users of the National Optical Astronomy Observatories, the National Radio Astronomy Observatories, the observatories at Mauna Kea, and the millimeter wave facilities at FCRAO and IRAM. They have also received extensive time on space-based observatories, including the Hubble Space Telescope.

There are additional research possibilities for graduate students at Brookhaven National Laboratory or Cold Spring Harbor Laboratory in various areas of physics not found in the department. Students may also find opportunities in related disciplines at Stony Brook in such programs as Medical Physics, Chemical Physics, Atmospheric and Climate Modeling, Materials Science, or Biophysics.

The entire faculty participates in teaching a rich curriculum, with many courses on special topics of current interest. Requirements are kept at a minimum to allow the student to set up a flexible program. Students are encouraged to participate in research as early as possible and to begin their thesis research no later than the beginning of their third year. The typical length of time to the Ph.D. is five or six years, whereas the Master's in Scientific Instrumentation is a two-year program that involves a thesis project in instrumentation design or development.

The Stony Brook Physics and Astronomy Department has been highly ranked in national surveys for the quality of its

graduate program, its faculty, and the impact of its published research. It strives to make a graduate education in physics intellectually stimulating and educationally rewarding.

Research Areas

Experimental High-Energy Physics

The Stony Brook group has been in the forefront of high energy research at most of the premier facilities in the United States, Europe, and Japan. A large effort is based on the Dfl experiment at the Fermilab collider, currently the highest energy accelerator in the world. The detector has been upgraded to seek new understanding of the top quark, to explore the mechanism of electroweak symmetry breaking and search for the Higgs boson, to study CP violation and mixing in the b quark system, to probe the strong QCD force in new regions, and to seek new phenomena such as supersymmetry or extra spatial dimensions. The group is also participating in the ATLAS experiment at the CERN Large Hadron Collider, expected to begin in 2007, and is building components of its calorimeter and event selection electronics. Our proximity to BNL continues to provide fruitful opportunities for research. We are a part of an experiment to measure the elastic scattering of polarized protons at RHIC. Further in the future, we are working to develop a 500 GeV e+e- linear collider somewhere in the world.

The group is involved in the Super-Kamiokande and the K2K experiments in Japan. The Super-Kamiokande detector, located deep underground in western Japan, detects neutrinos from the sun and neutrinos produced in the upper atmosphere. In 1998, the experiment discovered neutrino oscillations in the atmospheric neutrino data with a far-reaching impact in elementary particle physics. The experiment also aims to detect neutrinos from super-nova bursts. It is sensitive to a host of possible proton decay signals and has set the world's best limits on the proton decay. The

K2K experiment is a long baseline neutrino oscillation experiment that aims to confirm the discovery made by the Super-Kamiokande experiment on neutrino oscillation and refine the measurement of the neutrino mixing using accelerator-generated neutrino beams. Neutrinos are generated at the KEK laboratory on the east coast of Japan 250 km from Super-Kamiokande. Future extensions of this program will use neutrinos generated by the new JPARC accelerator. The group is also leading the effort to build a next generation underground neutrino detector somewhere in the western part of the United States.

Experimental Nuclear Physics

Since 1983, Stony Brook has operated a superconducting heavy-ion LINAC using beams from a van de Graaf accelerator, providing heavy-ion beams from C to Sn with energies that can surmount the Coulomb barrier of even the heaviest elements. This facility directly adjoins the Physics Building. The research program in low-energy nuclear physics presently focuses on the production of Francium for studies of atomic and nuclear properties in magneto-optical and ion traps. The precision spectroscopy of Fr allows us to study the weak interaction at energies many orders of magnitude lower than those used for experiments in high energy physics. In other experiments, high resolution gamma ray spectroscopy allows the study of nuclei with particular symmetries or properties that allow the determination of global properties of nuclear matter. The lab has extensive research equipment and modern data acquisition systems. The Stony Brook Relativistic Heavy Ion Group studies collisions of large nuclei at the highest available energies, with the intent of discovering, validating, and elucidating the properties of the quark-gluon plasma, a state in which quarks and gluons become deconfined. The group is one of the founders of the PHENIX experiment at BNL Relativistic Heavy Ion Collider. They are among the leading institutions in PHENIX having taken responsibility for the design and construction of the focal plane of the Ring-Imaging Cherenkov detector, the electronics and mechanics of the PHENIX drift chambers, the tracking software, and leadership of the overall analysis efforts of PHENIX data. This fruitful program

has included the first observations of jet quenching phenomena and excess nucleon yield at high transverse momentum, both discovered by the Stony Brook group's analysis of the PHENIX data. The group has also taken on the leadership role in the upgrade of PHENIX for second-generation RHIC measurements and intends to concentrate on penetrating probes to further probe the interior and earliest stages of the collision. A new effort using polarized proton scattering at RHIC will focus on how the proton spin is provided by its constituent quarks and gluons.

Optical Sciences

The optical sciences are among the most dynamic areas of physics with an impact on contemporary life that will continue to grow. Organized as an optics consortium, several groups in the department share an interest in optics and offer research opportunities in atomic molecular and optical physics, physics of optoelectronic materials, and x-ray optics and microscopy. The Laser Teaching Center is a focus for the activities of many student research projects.

Atomic, Molecular, and Optical Physics and Quantum Electronics

Atomic, molecular, and optical physics and quantum electronics experimental and theoretical studies focus on the interaction of light and matter under widely different circumstances. We are exploring new topics in optical manipulation of atoms both in the quantum (deBroglie) and the classical domains. We can exert huge optical forces with non-monochromatic light, create electrostatic forces on Rydberg atoms, and produce delicate momentum changes with Raman transitions. We explore dark state physics, coherent control of momentum exchange between atoms and light fields, and entanglement between orthogonal spaces. The boundary between quantal and classical physics is especially interesting when the latter is chaotic. Experiments on high-lying excited states of hydrogen, the simplest atom in nature, driven by microwave electric fields large enough to cause ionization have made this system a paradigm for studies on quantum chaos. Coherent control of photo-initiated reactions in helium Rydberg states permits a particular outcome. Noise added to the coherent driving fields has given surprises and new

opportunities for diagnosis and control of reaction paths. Modern laser technology allows pulses that are short compared to molecular vibrational periods, so by careful choice of their spectral content and phases, quantum chemistry can be controlled. The process exploits learning and genetic algorithms that control the behavior of fast modulators through sophisticated computing systems. Theoretical studies of Bose Einstein condensates (BEC) probe interesting new regimes of many-body physics. A new laboratory is taking shape to explore BEC's and correlated motion of atoms in optical lattices.

Experimental Condensed Matter, Mesoscopic and Nanoscale Physics

The department is active in several key areas of mesoscopic, nanoscale, and solid-state device physics, including quantum computing, single-electronics, molecular electronics, and nanoscale transistors. We have developed novel ultrafast superconducting digital devices and integrated circuits based on magnetic flux quantization, and single-electronic devices using ultra-small tunnel junctions with dimensions down to 30 nm. There is also an active program in solid-state and low-temperature physics. Areas of study include semiconductors, fullerenes, phase transitions in two-dimensional solids, integer and fractional quantum Hall effect, Wigner crystallization of the two-dimensional electron gas in semiconductor heterostructures, electronic properties of electron-hole systems, and electro-optic effects in quantum wells and superlattices. There is also a project to develop self-wiring "neuromorphic" computer architectures using a hybrid of 50nm lithographic crossbars and molecular conductors as active circuit elements. Projects at the National Synchrotron Light Source at BNL include powder diffraction studies on a wide range of materials (ranging from malaria pigment to intercalated fullerenes) and exploring new methods of electron spin resonance by using the far-infrared synchrotron light and superconducting magnets. A wide variety of modern techniques for fabrication of samples is employed including molecular beam epitaxy, deposition of thin films by resistive and electron-gun evaporation and magnetron sputtering, and patterning of thin-film structures using optical lithography and direct electron-beam writing.

X-Ray Physics

X rays have a wavelength short enough that one can produce a high-resolution focus and probe the structure of materials at the atomic scale. The X-ray Optics and Microscopy group carries out research in developing high resolution X-ray optics (in partnership with the Center for Functional Nanomaterials at BNL), and using these optics for soft X-ray microscopy and spectroscopy studies of problems in biology and in environmental science (the latter as part of a Center for Environmental Molecular Science at Stony Brook). The group is also developing X-ray imaging beyond the resolution limit of lenses by reconstructing diffraction data from non-crystalline specimens. Our research primarily makes use of the National Synchrotron Light Source at BNL, but also synchrotron sources at Argonne National Laboratory and Lawrence Berkeley National Laboratory.

Atmospheric Research

Atmospheric research may be carried out within the department and also with faculty in the Institute for Terrestrial and Planetary Atmospheres (ITPA). Our ground-based research based on measurements of stratospheric trace gases led to the first proof that the Antarctic "ozone hole" is caused by stratospheric contamination from man-made chlorofluorocarbons. Stratospheric dynamics can be studied by measuring the behavior of various inert tracers of transport, and chemistry-driven effects are studied by quantitative measurement of various species and their temporal and spatial evolution. Research in the ITPA includes advanced computer modeling or direct field studies of the chemistry and the large scale and mesoscale dynamics of atmospheres, including radiative transfer through atmospheres (the "greenhouse effect" and related phenomena), the atmospheric-ocean interchange, and the use of isotopic composition to characterize and monitor natural and anthropogenic trace gas sources and sinks in the earth's atmosphere. Close interaction of students in the department with faculty of the ITPA offers a way to participate actively in finding solutions to global-scale atmospheric-environmental problems facing the world in the 21st century. The Department of Environmental Sciences at BNL offers further opportunities for instrumentation development and laboratory and field studies of atmospheric dynamics and related topics.

Yang Institute for Theoretical Physics

Research at the C. N. Yang Institute for Theoretical Physics addresses varied topics of fundamental interest. The Institute provides students of the department the opportunity to carry on collaborative and independent research in a wide range of areas in theoretical physics.

The currently known forces and particles of high-energy physics are referred to as the standard model, including electroweak interactions and the theory of the strong interactions, quantum chromodynamics (QCD). The leading questions of high-energy and elementary particle physics emerge from unanswered questions raised by the standard model. Among these are the origins of electroweak symmetry breaking and of the patterns of particle masses. QCD is a unique testing ground for quantum field theory because of its highly energy-dependent interactions. Recent and ongoing studies in particle physics include detailed phenomenological calculations and analyses of high-energy scattering experiments, and the development of improved theoretical methods for both quantum QCD (including nuclear scattering) and electroweak interactions. There is a tradition in the study of neutrinos, now including analyses of masses and mixing in the light of contemporary data.

Quantum field and string theories supply a language for the description of matter on the smallest scales. Supersymmetric and other field theoretic extensions of the standard model, supergravity, and string theories are being studied and developed, with attention to both their mathematical structures and physical consequences. Of special interest are quantum mechanical descriptions of gravitation and its relations to other forces. Other directions of research involve the complementary descriptions of theories with weak and strong interactions, relying on modern techniques in mathematics, statistical mechanics, including exactly solvable models and quantum computing. Progress in statistical mechanics, string and field theory is facilitated by the many physical concepts and mathematical methods that they share.

The broad range of topics and interests represented at the YITP encourages fruitful interactions with the nuclear and condensed matter theory groups, the high-energy and nuclear experimental groups, and other groups in the departments of Physics and Astronomy, Mathematics, and Applied Mathematics.

Nuclear Theory

Traditionally, nuclear theory was limited to the study of properties of nuclei. However, in the past decade this field has broadened into the study of strong interactions in general with applications to a wide range of phenomena such as relativistic heavy ion collisions, the properties of hadrons, and the interior of neutron stars. The primary goal of nuclear theory is to understand strong interactions starting from quantum chromodynamics (QCD), the underlying microscopic theory. We address this problem in two different ways. First, to make contact with experiment, we construct and analyze phenomenological models. We investigate effective theories for the description of hadrons at low energy; have understood the pion wind in relativistic heavy ion collisions in terms of relativistic hydrodynamics; are world experts in many body theory, which relates the properties of nuclei to the nucleon-nucleon interaction; and apply our insights to problems in astrophysics such as the structure of the interior of neutron stars and the formation of black holes. Second, we analyze QCD as a quantum field theory from different perspectives and under different and extreme conditions. We are particularly interested in nonperturbative phenomena and answer questions such as: Why do nucleons exist? What are the properties of the vacuum? What is the phase of QCD at high temperature and baryon density? What are the properties of the quark-gluon plasma that might be observed in high-energy nuclear collisions? Is QCD at high baryon density superconducting? The methods we use to answer these questions are from many areas of quantum field theory and statistical mechanics. Examples include the analysis of the statistical mechanics of instantons, development of a semiclassical theory of high energy scattering, interpretation of gauge field fluctuations in terms of random matrix theory, and finite temperature quantum field theory. Our work has both benefited from and influenced large-scale Monte-Carlo simulations of lattice QCD by groups around the world.

Condensed Matter Theory and Statistical Mechanics

In the last decade, the development of a variety of new conceptual and computational tools has led to major changes in our understanding of condensed matter

systems. Recent work at Stony Brook has focused on quantum mechanical effects on a macroscopic scale, quantum computing, collective phenomena in low-dimensional solids such as conducting polymers, the quantum Hall effect, and properties of mesoscopic metals such as correlated tunneling and single-electron charging effects. Computer simulation of solids and liquids (including problems involving interfaces, surfaces, amorphous states, nanocrystals, and molecules) is being performed using both a local, dedicated super computer cluster and remote supercomputer facilities. In statistical mechanics there is very active research into one- and two-dimensional systems where exact mathematical calculations can be made. These include studies of phase transitions, solitons, and spin diffusion. The effort spans the range from quantum field theory to computer studies.

Accelerator and Beam Physics

Research in accelerator physics is being carried out at Stony Brook and in several departments at nearby Brookhaven National Laboratory. The research covers theoretical and experimental aspects of circular and linear accelerators as well as interaction of particle beams with electromagnetic radiation, including free electron lasers. The experimental facilities include the existing Stony Brook superconducting LINAC, the BNL Alternating Gradient Synchrotron, and the Relativistic Heavy-Ion Collider and the electron storage rings of the National Synchrotron Light Source. Research is also being conducted on facilities such as the high-brightness Accelerator Test Facility. BNL's interdepartmental Center for Accelerator Physics acts as a focus for research in various areas of accelerator and beam physics, including high-gradient acceleration, generation of high-brightness beams, and free-electron lasers. Ph.D. and M.S.I. research at BNL may be arranged through the Center for Accelerator Physics.

Astronomy and Astrophysics Cosmology and Extragalactic Astronomy

The cosmological and extragalactic effort combines theoretical and observational research to understand galaxy formation and evolution, and the development of large-scale structure in the universe. Theoretical efforts are aimed at interpreting the density structures uncovered by redshift surveys and have

resulted in the determination of the gravitational field out to 0.5 billion light years. N-body hydrodynamics simulations of the large-scale structure are compared to the fast-growing body of data of large-scale field flows and the cosmic background radiation. Our observational efforts have focused on quasar absorption lines, which have revealed extensive galactic halos, and on the Hubble Deep field, in which the most distant objects in the universe have been found.

Millimeter Wave Astronomy and Interstellar Molecular Clouds

Stony Brook is involved in millimeter CO surveys in the galactic plane; in 1977 these first revealed the existence of giant molecular clouds. Current research focuses on determining the star formation rates in these clouds and producing high resolution maps of the star-forming cores, and uses both infrared and millimeter wave observatories, including IRAS and the IRAM 30-meter antenna, the world's most powerful millimeter wave antenna. Extragalactic mapping of interstellar molecules like CO and CS is performed to understand the role played by giant molecular clouds in star formation and the evolution of spiral galaxies. Recently, CS emission has been detected in the luminous infrared galaxy Arp220, indicating the existence of 10 billion solar masses of dense molecular gas and extensive star formation. Mappings are also used to understand the effects of galaxy collisions on star formation and the starburst phenomenon.

Nuclear Astrophysics

Nuclear astrophysics research focuses on supernovae, neutron stars, and gamma ray bursters, as well as on the physics of dense matter. Models for the dense matter equation of state and neutrino opacities developed by Stony Brook are used worldwide. Simulations of supernovae and gamma ray bursters are carried out under the auspices of major supercomputer initiatives funded by DOE and NASA. This work continues a long tradition of computational astrophysics at Stony Brook, including the modeling of supernovae and proto-neutron stars spectacularly confirmed by neutrino observations from 5N1987A. Other active areas of research are neutron star structure and cooling, including the effects of composition and superfluidity, and binary neutron star mergers.

Astronomers at Stony Brook have recently discovered the closest neutron star and measured its distance, temperature, and age. A major goal is to determine the radii of neutron stars combining calculations of neutron star atmospheres (employing various compositions and magnetic fields) with optical and X-ray observations (from Hubble, CHANDRA, XMM and other instruments) of this and other neutron stars.

Research on gamma-ray bursts has focused both on the source and mechanism of these large explosions, and on their aftermath. The sources have been identified as being some variety of end product of massive stars, possibly a type of rare supernovae, that form black holes. We also study the long-lasting "afterglows" of the explosions, which can be used to investigate the environment of the explosions and, in view of their extreme brightness, can be seen out to greater distances than even quasars.

Star Formation and Stellar Astronomy

Star formation research focuses on low-mass pre-main sequence (PMS) evolution and the true initial mass function. This research has demonstrated that most PMS stars are not T-Tauri objects and also that most are in binary systems. We study the early evolution of PMS stars, measure their masses, and probe the structure and composition of their circumstellar disks using state-of-the-art optical, infrared, and millimeter-wave techniques from the ground and space. We participate in a space interferometry project to study the earliest epochs of planet formation. We are actively investigating the environments of the pre-main sequence stars, using CHANDRA and XMM, to study the 10^7 K coronal gas, and using FUSE and the Hubble Space Telescope to study the stellar chromospheres, the accretion process, and circumstellar molecular hydrogen. We also study the outer atmospheres and the coronal and chromospheric activity of older cool stars using optical, ultraviolet, and X-ray spectra obtained from the ground and space observatories.

Doctoral Programs with Concentrations in Biophysics and Chemical Physics

The Department of Physics and Astronomy participates in two Ph.D.

curricula in cooperation with other programs. The basic degree requirements for a student enrolled in one of these programs are the same as those for other students in physics. He or she will usually be advised to take one or more courses in the cooperating program. The written part of the preliminary examination is the same as for other physics students; the oral part will ordinarily be on topics in biophysics or chemical physics. Subject to the approval of the chairpersons of the two programs involved, the student's research advisor may be chosen from participating members of the cooperating programs.

A student in one of these programs who expects to receive a Ph.D. from a cooperating program should consult that program's section in this bulletin for degree requirements. The cooperating programs are Biophysics: Department of Pharmacological Sciences and Department of Physiology and Biophysics; and Chemical Physics: Department of Chemistry.

Admission

For admission to graduate study in Physics and Astronomy the following, in addition to the minimum Graduate School requirements, are required:

A. A bachelor's degree in physics or a closely related field from an accredited institution;

B. A minimum grade average of B in all undergraduate coursework, and B or better in the sciences and mathematics;

C. Submission of the Graduate Record Examination (GRE) General Test (the Physics GRE subject test is also recommended);

D. Admission by the Department of Physics and Astronomy and the Graduate School.

In special cases, a student not meeting requirement A (or, in unusual cases, requirement B) may be admitted on a provisional basis, without financial support. Upon admission, the student will be informed of the requirements that must be satisfied for termination of provisional status.

Retention of students in subsequent years will depend on satisfactory academic progress.

Faculty

Einstein Professor

Yang, Chen Ning¹, *Emeritus*. Ph.D., 1948, University of Chicago: Theoretical physics; field theory; statistical mechanics; particle physics.

University Professor

Marburger, John H., *Former Director of Brookhaven National Laboratory and Former President of Stony Brook University. Currently the Science Advisor to the President*. Ph.D., 1966, Stanford University: Laser theory.

Distinguished Professors

Brown, Gerald E., Ph.D., 1950, Yale University: Theoretical physics; the many-body problem.

Grannis, Paul D., Ph.D., 1965, University of California, Berkeley: Experimental high-energy physics.

Kirz, Janos, Ph.D., 1963, University of California, Berkeley: X-ray optics and microscopy; synchrotron radiation.

Likharev, Kostya, Ph.D., 1979, Moscow State University, Russia: Mesoscopic physics.

McCoy, Barry M.¹, Ph.D., 1967, Harvard University: Theoretical physics; statistical mechanics.

Solomon, Philip, Ph.D., 1964, University of Wisconsin: Interstellar molecules and physics of the interstellar medium; radio astronomy; star formation in the early universe; quasi-stellar objects.

Shuryak, Edward, Ph.D., 1974, Institute of Nuclear Physics, Novosibirsk, Russia: Theoretical nuclear physics.

Sterman, George¹, Director of Yang Institute for Theoretical Physics. Ph.D., 1974, University of Maryland: Theoretical physics.

Van Nieuwenhuizen, Peter¹, Ph.D., 1971, University of Utrecht, Netherlands: Theoretical physics; quantum field theory.

Distinguished Service Professor

Paul, Peter, Ph.D., 1959, University of Freiburg, Germany: Experimental nuclear physics.

Distinguished Teaching Professor

Metcalfe, Harold J., Ph.D., 1967, Brown University: Atomic physics; laser cooling and trapping; atom optics; precision stark spectroscopy; lasers and optics.

Professors

Allen, Philip B. Ph.D., 1969, University of California, Berkeley: Theoretical condensed matter physics.

Aronson, Meigan, Ph.D., 1988, University of Illinois: Experimental solid state physics.

Averin, Dmitrii V., Ph.D., 1987, Moscow State University, Russia: Theoretical condensed matter physics.

Courant, Ernest D.¹, *Emeritus*. Ph.D., 1943, University of Rochester: Theoretical physics; high-energy accelerator design.

DeZafra, Robert L., *Emeritus*. Ph.D., 1958, University of Maryland: Atmospheric sciences; remote sensing, stratospheric dynamics, and trace constituent measurements; millimeter-wave spectroscopy.

Dierker, Steven, Ph.D., 1983, University of Illinois: Experimental solid state physics.

Drees, Klaus Axel, Ph.D., 1989, University of Heidelberg, Germany: Experimental nuclear physics; relativistic heavy ions.

Engelmann, Roderich, Ph.D., 1966, University of Heidelberg, Germany: Experimental high-energy physics.

Feingold, Arnold, *Emeritus*. Ph.D., 1952, Princeton University: Theoretical nuclear physics.

Finocchiaro, Guido, *Emeritus*. Ph.D., 1957, University of Catania, Italy: Experimental high-energy physics.

Goldhaber, Alfred S.¹, Ph.D., 1964, Princeton University: Theoretical physics; nuclear theory; particle physics.

Goldman, Vladimir J., Ph.D., 1985, University of Maryland: Experimental condensed matter physics.

Gurvitch, Michael, Ph.D., 1978, Stony Brook University: Experimental condensed matter physics.

Hemmick, Thomas, Ph.D., 1989, University of Rochester: Experimental nuclear physics; relativistic heavy ions.

Jacak, Barbara, Ph.D., 1984, Michigan State University: Experimental nuclear physics; relativistic heavy ions.

Jacobsen, Chris, *Undergraduate Program Director*. Ph.D., 1988, Stony Brook University: X-ray microscopy and holography.

Jung, Chang Kee, Ph.D., 1986, Indiana University: Experimental high-energy physics.

Kahn, Peter B., *Emeritus*. Ph.D., 1960, Northwestern University: Theoretical physics; nonlinear dynamics.

Koch, Peter M., *Chairperson*. Ph.D., 1974, Yale University: Experimental atomic physics; quantum chaos; nonlinear dynamics.

Korepin, Vladimir¹, Ph.D., 1977, Leningrad University, Russia: Theoretical physics.

Kuo, Thomas T.S., Ph.D., 1964, University of Pittsburgh: Nuclear theory.

Lanzetta, Kenneth M., Ph.D., 1988, University of Pittsburgh: Formation and evolution of galaxies; evolution of the intergalactic medium.

Lattimer, James M., Ph.D., 1976, University of Texas: Nuclear, neutrino, and high-energy astrophysics; supernovae, neutron stars, dense matter; grain formation; isotopic anomalies in meteorites.

Lee, Linwood L., *Emeritus*. Ph.D., 1955, Yale University: Experimental nuclear physics.

Lukens, James, Ph.D., 1968, University of California, San Diego: Experimental condensed matter physics.

Marx, Michael D., Ph.D., 1974, Massachusetts Institute of Technology: Experimental high-energy physics.

McCarthy, Robert L., Ph.D., 1971, University of California, Berkeley: Experimental high-energy physics.

McGrath, Robert L., *Provost and Vice President for Brookhaven Affairs*. Ph.D., 1965, University of Iowa: Experimental nuclear physics.

Mendez, Emilio, Ph.D., 1979, Massachusetts Institute of Technology: Experimental condensed matter physics.

Mihaly, Laszlo, *Graduate Program Director*. Ph.D., 1977, Eotvos Lorand University, Budapest, Hungary: Experimental condensed matter physics.

Rijssenbeek, Michael, Ph.D., 1979, University of Amsterdam, Netherlands: Experimental high-energy physics.

Rocek, Martin¹, Ph.D., 1979, Harvard University: Theoretical physics: supersymmetry and supergravity.

Shrock, Robert¹, Ph.D., 1975, Princeton University: Theoretical physics; gauge theories; statistical mechanics.

Siegel, Warren¹, Ph.D., 1977, University of California, Berkeley: Theoretical physics; strings.

Simon, Michal, Ph.D., 1967, Cornell University: Infrared astronomy; physics of the interstellar medium; star formation; solar astronomy.

Smith, John¹, Ph.D., 1963, University of Edinburgh, Scotland: Theoretical physics; elementary particle physics.

Sprouse, Gene D., Ph.D., 1968, Stanford University: Atomic and nuclear spectroscopy with trapped radioactive atoms.

Stephens, Peter W., Ph.D., 1978, Massachusetts Institute of Technology: Experimental condensed matter physics.

Swartz, Clifford E., *Emeritus*. Ph.D., 1951, University of Rochester: Experimental high-energy physics; school curriculum revision.

Verbaarschot, Jac, Ph.D., 1982, University of Utrecht, Netherlands: Theoretical nuclear physics.

Walter, Fredrick M., Ph.D., 1981, University of California, Berkeley: Stellar astrophysics, including X-ray optical and infrared photometry and spectroscopy; RS CV objects; pre-main sequence objects.

Weisberger, William¹, Ph.D., 1964, Massachusetts Institute of Technology: Theoretical physics; quantum field theory; particle physics.

Yahil, Amos, Ph.D., 1970, California Institute of Technology: Galaxies; clusters of galaxies; physical cosmology; accretion processes; stellar collapse; supernovae; nuclear astrophysics.

Zahed, Ismail, Ph.D., 1983, Massachusetts Institute of Technology: Theoretical nuclear physics.

Associate Professors

Abanov, Alexander, Ph.D., 1997, Moscow Institute of Physics and Technology: Theoretical condensed matter physics.

Evans, Aaron, Ph.D., 1996, University of Hawaii: Near-infrared and millimeter-wave astronomy; evolution and collisions of galaxies.

Gonzalez-Garcia¹, Concha, Ph.D., 1991, Universidad de Valencia, Spain: Theoretical elementary particle physics.

Graf, Erlend H., Ph.D., 1967, Cornell University: Experimental low-temperature physics.

Hobbs, John, Ph.D., 1991, University of Chicago: Experimental high-energy physics.

Mould, Richard A., *Emeritus*. Ph.D., 1957, Yale University: Theoretical physics; general relativity; quantum theory of measurements.

Peterson, Deane M., Ph.D., 1968, Harvard University: Stellar atmospheres; radiative transfer; optical interferometry; stellar imaging.

Assistant Professors

Deshpande, Anhay, Ph.D., 1995, Yale University: Nucleon spin and heavy ion physics.

Durst, Adam, Ph.D., 2002, Massachusetts Institute of Technology: Theoretical condensed matter physics.

McGrew, Clark, Ph.D., 1994, UCI experimental high energy physics.

Rastelli, Leonardo¹, Ph.D., 2000, Massachusetts Institute of Technology: String theory.

Schneble, Dominik, Ph.D., 2002, University of Konstanz: Experimental atomic physics; ultracold quantum gases.

Weinacht, Thomas, Ph.D., 2000, University of Michigan: Quantum optics and atomic physics.

Wiedemann, Urs, Ph.D., 1995, University of Zurich: Nuclear theory.

Zingale, Michael, Ph.D., 2000, University of Chicago: Computational astrophysics.

Research Faculty

Averbeck, Ralf, Ph.D., 1996, Justus-Liebig University, Germany: Experimental nuclear physics.

Semenov, Vasili, Ph.D., 1975, Moscow State University, Russia: Experimental condensed matter physics.

Swesty, Doug, Ph.D., 1993, Stony Brook University: Computational and nuclear astrophysics.

Yanagisawa, Chiaki, Ph.D., 1981, University of Tokyo, Japan: Experimental high energy physics.

Adjunct Faculty

Abbamonte, Peter, Ph.D., 1999, University of Illinois: Condensed matter physics.

Ben-Zvi, Ilan, Ph.D., 1967, Weizmann Institute, Israel: Accelerator and beam physics.

Bergeman, Thomas, Ph.D., 1971, Harvard University: Theoretical atomic physics; interac-

tion of light and matter; laser cooling; Bose condensation.

Chaudhari, Praveen, Ph.D., 1966, Massachusetts Institute of Technology: Solid state physics.

Chklovskii, Mitya, Ph.D., 1994, Massachusetts Institute of Technology: Biophysics.

Creutz, Michael¹, Ph.D., 1970, Stanford University: Lattice gauge theory.

Davenport, James, Ph.D., 1976, University of Pennsylvania: Theoretical condensed matter physics.

Dawson, Sally¹, Ph.D., 1981, Harvard University: High energy theory.

DiMauro, Louis, Ph.D., Experimental atomic physics.

Forman, Miriam, Ph.D., 1972, Stony Brook University: Cosmic rays.

Geller, Marvin, Ph.D., 1969, Massachusetts Institute of Technology: Atmospheric physics.

Johnson, Peter, Ph.D., 1978, Warwick University: Experimental solid state physics.

Kao, Chi-Chang, Ph.D., 1988, Cornell University: Condensed matter physics.

Ku, Wei, Ph.D., 2000, University of Tennessee: Theoretical condensed matter physics.

Lee-Franzini, Juliet, Ph.D., 1960, Columbia University: Experimental high-energy physics.

Li, Qiang, Ph.D., 1981, Iowa State: Materials science.

Litvinenko, Vladimir, Ph.D., 1989, Institute of Nuclear Physics, Novosibirsk, Russia: Accelerator physics and free electron lasers.

Maslov, Sergei, Ph.D., 1996, Stony Brook University: Theoretical condensed matter physics.

Orozco, Luis, Ph.D., 1987, University of Texas, Austin: Quantum optics; atomic physics.

Peggs, Steven, Ph.D., 1981, Cornell University: Accelerator physics.

Rapp, Ralf, Ph.D., 1996, Bonn University, Germany: Nuclear theory.

Sayre, David, Ph.D., 1951, Oxford University: X-ray physics.

Svoboda, Karel, Ph.D., 1994, Harvard University: Experimental biophysics.

Takai, Helio, Ph.D., 1986, Rio de Janeiro: Experimental particle and heavy ion physics.

Tolpygo, Sergei, Ph.D.: Mesoscopic physics.

Tselik, Alexei, Ph.D., 1980, Kurchatov Institute of Atomic Energy, Moscow, Russia: Theoretical condensed matter physics.

Wijers, Ralph, Ph.D., 1991, University of Amsterdam, The Netherlands: Astrophysics; gamma ray bursters.

Zhang, Michael, Ph.D., 1987, Rutgers University: Computational biophysics.

Number of teaching, graduate, and research assistants, fall 2005: 177

1) Member, C.N. Yang Institute for Theoretical Physics

Degree Requirements Requirements for the M.A. Degree in Physics

A. Satisfactory performance in a program of studies (30 graduate credits) approved by the department; normally such a program would include graduate seminars, classical mechanics, electrodynamics, and quantum mechanics;

B. Minimum grade point average of 3.0 in all graduate courses taken at Stony Brook;

C. Either passing the graduate comprehensive examination at the master's level or completion of a master's project.

Requirements for the M.A.T. Degree in Physics

The Master of Arts in Teaching Physics is a course of study leading to New York State provisional certification for teaching physics in secondary schools. It also prepares the student for the examinations for permanent certification.

The M.A.T. program combines the state-required education courses with graduate study in physics. The physics courses are chosen in consultation with department advisors to match the student's background and interests. Some of these courses may be extensions of standard undergraduate courses, with special assignments to make them appropriate for graduate work and a career in teaching.

Work toward this degree ordinarily involves two semesters of coursework and one semester of supervised intern experience teaching physics in a secondary school. The curriculum consists of 36 credits with a minimum grade point average of 3.0.

1. Six credit hours in Foundations of Education and Adolescent Growth and Development;

2. Six credit hours in Introduction to Science Teaching and Science Teaching Methods;

3. Nine credit hours in Student Teaching and Seminar;

4. Twelve credit hours in appropriate physics courses;

5. Three credit hours of project work on a topic in physics associated with classroom teaching at the secondary level; this course also involves preparation of the master's thesis.

For further information on this program, see the School of Professional Development section in this bulletin or contact Professor Robert McCarthy.

Requirements for the M.S. Degree with Specialization in Scientific Instrumentation

A candidate for the master's degree with concentration in instrumentation will be required to demonstrate a certain level of knowledge of physics (by written and/or oral examination), to take certain required and elective courses, and to complete both a major and minor project. The curriculum is designed to meet the needs of students learning about the design, construction, and testing of sophisticated instrument systems. The degree holder will not be a super-technician but a professional scientist trained in both physics and measurement techniques.

A. A student shall demonstrate proficiency in undergraduate physics at the level of the courses PHY 335, 405, 431, and 472. This can be done (1) by acceptance by the Master's in Scientific Instrumentation Committee of courses taken as an undergraduate, (2) by written examination, or (3) by passing the courses appropriate to a student's deficiencies;

B. Thirty credits (minimum) of graduate courses (500 level or above), including a minor project and a master's thesis are required. This thesis must describe a major piece of work in scientific instrumentation and must be in a form acceptable to the Graduate School. It need not be original research in the same sense as a Ph.D. thesis, but it should be the result of an effort consistent with a full year of full-time work. The thesis should present an improvement of the state of the art in some area, the development of a sophisticated and/or automated apparatus, or some other significant laboratory project, and be defended before a committee;

C. Students shall work as teaching assistants in an undergraduate laboratory for at least one semester;

D. Students shall acquire those technical skills deemed necessary by their thesis supervisors. These must include, but are not limited to, machining capability and computer literacy.

Each student will be assigned a committee of three faculty members

and will be required to meet frequently with them. It is expected that close communication among all the faculty and students involved will foster spirit, expose problems, and generally contribute to success.

For further information on this program, contact Professor Harold Metcalf.

Requirements for the Ph.D. Degree

A. Completion of the following core courses with a grade of B or better: 501, 505, 506, 511, 512, 540. A student can skip one or more of these courses by sufficiently good performance in the corresponding parts of a placement examination given at the beginning of each fall semester;

B. Completion of required courses; each of the courses listed below must be passed with a minimum grade of B:

1. PHY 598 and PHY 599 Graduate Seminars. These courses are normally taken during the first year of graduate study, one per semester in either order.

2. PHY 515 Methods of Experimental Research. This course must be taken not later than the fourth semester of residence.

3. Two advanced courses, each in an area outside that of the student's thesis research, chosen from a list of courses approved for this purpose.

C. Passing of the written comprehensive examination. This is offered at the beginning of each semester and generally draws from courses beyond the core listed in paragraph A above. It must be passed in the student's fourth semester of study at Stony Brook or earlier;

D. Passing an oral examination on a broad range of topics relevant to the student's intended area of thesis research. The oral examination should be passed before the beginning of the fifth semester of residency.

E. Acceptance of graduate student by an advisor for thesis work;

F. Teaching experience at least equivalent to that obtained in a one-year appointment as a teaching assistant, usually carried out in the first year;

G. Advancement to candidacy for the Ph.D. The department's recommendation

to the Graduate School for advancement to candidacy is based on the satisfactory completion of all requirements listed above;

H. Research, dissertation, and passing the dissertation examination;

I. At least one year of residence. Must be filed before end of student's first semester.

Courses

PHY 501 Classical Mechanics

Lagrangian and Hamiltonian formulations with applications to various dynamical systems. Variational principles, symmetries and conservation laws. Hamilton-Jacobi theory. Introduction to selected advanced subjects such as nonlinear oscillations, parametric oscillations, classical perturbation theory, integrable and chaotic systems, theory of elastic field.

Fall, 3 credits, ABCF grading

PHY 503 Methods of Mathematical Physics I

A selection of mathematical techniques useful for physicists. Topics are selected from: linear algebra, complex variables, differential equations, asymptotic analysis, special functions, boundary value problems, integral transforms, perturbation theory as applied to linear and nonlinear systems. This course should be taken by entering graduate students seeking enrichment in these areas.

Fall and spring, 3 credits, ABCF grading

PHY 504 Methods of Mathematical Physics II

A selection of advanced mathematical techniques useful for physicists. Topics are selected from: integral equations, group theory, conformal field theory, advanced statistics, stochastic methods, modern geometry, topology, Green functions, variational calculus. This course is offered to graduate students with special interest in mathematical methods.

Fall and spring, 3 credits, ABCF grading

PHY 505 Classical Electrodynamics I

First course in a two-part sequence. Electrostatics and magnetostatics in vacuum and matter; electromagnetic induction, Maxwell's equations and gauge invariance; electromagnetic waves. Additional topics as time permits. Vector analysis, eigenfunction expansions and Green functions will be introduced and used.

Fall, 3 credits, ABCF grading

PHY 506 Classical Electrodynamics II

Second course in a two-part sequence. Maxwell's equations are applied to electromagnetic waves in materials and at interfaces between media. Electromagnetic radiation by moving charges. Special relativity. Additional topics as time permits.

Spring, 3 credits, ABCF grading

PHY 510 Introduction to Nonlinear Dynamics

This course concentrates on developing the tools used to analyze models of dynamical systems associated with physical phenomena,

such as coupled electrical mechanical, chemical and biological oscillators, amplitude equations, symplectic maps, etc. There is a discussion of the basic theorems, as well as methods used to derive perturbation solutions for differential equations and maps using the method of normal forms.

Spring, 3 credits, ABCF grading

PHY 511 Quantum Mechanics I

First course in a two-part sequence. Topics include basic quantum physics and mathematical apparatus; application to one dimensional examples and simple systems. Symmetries, angular momentum, and spin. Additional topics as time permits.

Fall, 3 credits, ABCF grading

PHY 512 Quantum Mechanics II

Second course in a two-part sequence, covering variational principles, perturbation theory, relativistic quantum mechanics, quantization of the radiation field, many-body systems. Application to atoms, solids, nuclei and elementary particles, as time permits.

Spring, 3 credits, ABCF grading

PHY 514 Current Research Instruments

In a series of distinct units, various members of the experimental research faculty describe the nature of their work, explain the major principles of their laboratory instruments, discuss how these instrument systems function, and conduct tours of their laboratories showing the apparatus in action. The student becomes familiar with most of the experimental research instrumentation in the department.

Fall or spring, 3 credits, S/U grading

PHY 515 Methods of Experimental Research I

An experimental course required for all graduate students. The goal of the course is to provide firsthand experience with the nature of experimental work. For students oriented toward theory, the course gives a background for reading and evaluating experimental papers. The course is based on classic measurements in nuclear, particle, atomic, condensed matter physics, and astronomy. Students can gain experience in handling cryogenic liquids, vacuum systems, lasers, pulse counting and coincidence methods, resonance measurements, and electronic instrumentation, such as lock-in amplifiers, particle detectors, coincidence counters, computer control, etc. Numerical analysis of data, presentation of results in written, graphic, and oral form, and meaningful comparison of experiments and theory are part of the course. Working alone or with, at most, one partner, each student must do one experiment from each of four different groups.

Fall or spring, 3 credits, ABCF grading

May be repeated for credit

PHY 517 Laboratory Course in Astronomical Techniques

A course designed to introduce the theory, design, and operation of modern astronomical instrumentation and to familiarize the student with the use of telescopes. Current astronomical techniques will be discussed with emphasis on methods of observational measurements and reduction of data. Emphasis is given on optical techniques

appropriate for wavelengths shorter than one micron. Extensive laboratory and observing exercises may be expected.

Spring, alternate years, 3 credits, ABCF grading

PHY 521 Stars

A study of the atmospheres, interiors, and evolution of stars. The contact between theory and observations is emphasized. Stellar atmospheres in hydrostatic and radiative equilibrium described. Models for the calculation of stellar spectra are discussed. Stellar winds are studied. Next, theoretical studies of stellar interiors and evolution, including equations of state, energy transport, and nuclear energy generation, are developed. Structures of main sequence, red giant, pre-main sequence, and white dwarves are studied and compared to observations. The evolution of single stars up to supernovae and the peculiar evolution of close binary systems are also studied.

Fall, alternate years, 0-3 credits,

ABCF grading

PHY 522 Interstellar Medium

A study of the interstellar medium with emphasis on physical processes. Topics include kinetic theory, equation of transfer, spectral lines, non-thermal emission, ionization effects of dust, and formation and spectroscopy of molecular clouds. The components of the interstellar medium and the interactions between them are discussed in detail, as well as the process of star formation.

Spring, alternate years, 0-3 credits,

ABCF grading

PHY 523 Galaxies

A basic course on the observational and theoretical aspects of the content, morphology, kinematics, and dynamics of galaxies. Topics include the size, shape, and location of the sun in the Milky Way; stellar populations; the disk and spheroidal components; galactic rotation; distance determination in the Milky Way and to external galaxies; galaxy classification and the Hubble Law. Theoretical topics center on stellar dynamics, including potential theory; stellar orbits; and spiral structure. The course also includes a brief introduction to cosmology.

Fall, alternate years, 0-3 credits,

ABCF grading

PHY 524 Cosmology

A basic course on cosmology: Hubble expansion, Friedmann universes, age of the universe, microwave background radiation, big-bang nucleosynthesis, inflation, growth of gravitational instabilities and galaxy formation, correlation functions, local density and velocity perturbations, and dark matter.

Spring, alternate years, 0-3 credits,

ABCF grading

PHY 533 High Energy Astrophysics

Physical processes that occur at high temperatures and pressures, including X-ray and gamma ray emission, cosmic rays, bremsstrahlung, synchrotron, inverse Compton radiation, and gravitational radiation. Topics also include stellar and galactic accretion processes and jets, including relativistic

effects and superluminal expansion. We discuss applications to stellar coronae, supernova remnants, X-ray binaries, pulsars, and compact extragalactic objects.

Spring, alternate years, 0-3 credits, ABCF grading

PHY 534 Radio Astronomy

Topics covered include continuum and spectral-line radio astronomy. Within the Milky Way Galaxy topics include the interstellar medium, the physics and kinematics of molecular clouds, star formation in giant molecular clouds, chemistry of molecular clouds, galactic structure, spiral structure, and pulsars. Extragalactic topics include radio galaxies and jets, radio loud quasars, molecular and atomic gas in galaxies, luminous infrared galaxies, the missing mass problem in spiral galaxies, and cosmic microwave background radiation. Radio astronomy measurement techniques for single telescopes and aperture synthesis techniques are also covered, although the emphasis is on scientific results.

Spring, alternate years, 0-3 credits, ABCF grading

PHY 540 Statistical Mechanics

Brief review of thermodynamics, principles of physical statistics, systems of non-interacting particles: Boltzmann, Fermi-Dirac, and Bose-Einstein statistics. Applications to ideal gases, electrons and phonons in solids, and black body radiation. Approximate treatment of non-ideal gases. First-order and second-order phase transitions. Ising model, transfer matrix, and renormalization group approach. Fluctuations in thermal equilibrium, fluctuation-dissipation theorem, brief review of non-equilibrium fluctuations. Basic notions of ergodicity, classical and quantum chaos.

Spring, 0-3 credits, ABCF grading

PHY 541 Advanced Statistical Mechanics

Topics are selected from cluster expansions, elementary theory of quantum fluids, phase transitions, transfer matrix, Ising and ferroelectric models, polymers and membranes, disordered systems, and fluctuation and non-equilibrium phenomena.

Fall, 0-3 credits, ABCF grading

PHY 551 Nuclear Physics I

Nucleon structure, conservation laws and the static quark model; nuclear force and the two nucleon system; bulk properties of nuclear matter, charge distribution, spin, isospin, mass, alpha decay, nuclear fission; electromagnetic and weak interaction; collective motion; microscopic models of the nucleus; nuclear matter under extreme conditions, high rotational states, heavy ion physics at RHIC, nuclear astrophysics.

Spring, 0-3 credits, ABCF grading

PHY 552 Nuclear Physics II

Nucleon-nucleon scattering and effective range approximation; the nucleon-nucleon interaction calculated from meson exchange; effective forces between nucleons in nuclei and nuclear matter; the renormalization group approach to these interactions; Fermi-liquid theory of the nuclear many-body problem; thermodynamics of hadrons at high temperature; RHIC physics with heavy ions including transition from hadrons to quark

gluon plasma, restoration of chiral symmetry, equation of state, initial conditions, thermodynamics of hadrons at high temperature.

0-3 credits, ABCF grading

PHY 555 Solid-State Physics I

This course concentrates on the basic notions of solid state physics, treated mostly within the single-particle approximation. Main topics include: crystal lattices and symmetries, reciprocal lattice and state counting, phonons, electron energy band theory, bonding and cohesion (semi-quantitatively), electron dynamics and electron transport in metals and semiconductors, screening, optical properties of solids, and an introduction to superconductivity and magnetism.

Fall, 0-3 credits, ABCF grading

PHY 556 Solid State Physics II

The course focuses on the many-particle aspects of solid state physics addressing classical topics such as superconductivity and the transport properties of disordered conductors, as well as more modern subjects including the fractional quantum Hall effect, dissipative quantum mechanics, and problems of mesoscopic physics. Both phenomenological and theoretical descriptions are discussed.

Spring, 0-3 credits, ABCF grading

PHY 557 Elementary Particle Physics

Introduction to elementary particle physics. Symmetries and invariance in particle physics. The properties of particles in terms of quarks and leptons and their interactions. An introduction to the electroweak and for strong interactions. Interactions at high energies. Interactions between particles and matter, experiments in particle and experimental results. Survey of particle accelerators.

Fall or spring, 0-3 credits, ABCF grading

PHY 562 Lasers and Modern Optics

Introduction to the theory of lasers including resonance conditions, normal modes, optical cavities and elementary quantum mechanics. Description of types of lasers, methods of control, limitations of power, precision, wavelength, etc. Applications to research and industry. Throughout the course, there will be many problems that involve writing computer programs to solve simple differential equations and model different aspects of laser operation. Not for satisfying physics Ph.D. breadth course requirements.

Fall, every year, 0-3 credits, ABCF grading

PHY 565 Quantum Electronics I: Atomic Physics

Quantum electronics is a synthesis of quantum physics and electrical engineering, and is introduced in two independent semesters. A description of simple atoms and molecules and their interaction with radiation includes atoms in strong and/or weak external fields, two-photon spectroscopy, superradiance, Rydberg states, lasers and laser spectroscopy, coherent transients, etc.

Spring, 0-3 credits, ABCF grading

PHY 566 Quantum Electronics II: Quantum Optics

Quantum electronics is a synthesis of quantum physics and electrical engineering, and is introduced in two independent semesters. This course focuses on the quantum proper-

ties of light. The quantized electromagnetic field and its correlations are used to understand nonclassical states from various sources such as two-level atoms and nonlinear systems interacting with radiation fields.

Fall, 0-3 credits, ABCF grading

PHY 570 Introductory Physics

Revisited for Teachers

This seminar allows students to explore the fine points of topics normally covered in high school physics. Not for Ph.D. credit.

Spring, 0-3 credits, ABCF grading

PHY 571 Electromagnetic Theory for Teachers

The course reviews vector calculus and develops Maxwell's equations relating electric and magnetic fields to their sources. Applications for time-independent fields are developed for solving boundary value problems and the interactions of fields in bulk matter. An oral presentation of a relevant topic suitable for a high-school class is required. Not for Ph.D. credit.

Fall, 0-3 credits, ABCF grading

PHY 573 Mechanics for Teachers

The Newtonian formulation of classical mechanics is reviewed and applied to more advanced problems than those considered in introductory physics. The Lagrangian and Hamiltonian methods are then derived from the Newtonian treatment and applied to various problems. An oral presentation of a relevant topic suitable for a high-school class is required. Not for Ph.D. credit.

Fall, 0-3 credits, ABCF grading

PHY 576 Thermodynamics and Statistical Mechanics for Teachers

This course consists of two parts. Those relations among the properties of systems at thermal equilibrium that are independent of a detailed microscopic understanding are developed by use of the first and second laws of thermodynamics. The concepts of temperature, internal energy and entropy are analyzed. The thermodynamic potentials are introduced. Applications to a wide variety of systems are made. The second portion of the course, beginning with the kinetic theory of gases, develops elementary statistical mechanics, relates entropy and probability, and treats simple examples in classical and quantum statistics. An oral presentation of a relevant topic suitable for a high-school class is required. Not for Ph.D. credit.

Spring, 0-3 credits, ABCF grading

PHY 578 Quantum Physics for Teachers

The concepts, historical development and mathematical methods of quantum mechanics. Topics include Schroedinger's equation in time-dependent and time-independent forms, and one- and three-dimensional solutions, including the treatment of angular momentum and spin. Applications to simple systems, especially the hydrogen atom, are stressed. An oral presentation of a relevant topic suitable for a high-school class is required. Not for Ph.D. credit.

Spring, 0-3 credits, ABCF grading

PHY 579 Special Topics for Teachers

Topics of current interest to high school teachers are discussed in order to bring the

teachers up to date on the latest developments in various areas of research. Examples could include the standard model of particle physics, nanofabrication techniques, atomic force microscopy, etc. Not for Ph.D. credit.

*Spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 580 Special Research Projects

Research under the direction of a faculty member. Not open to Ph.D. candidates.

*Fall and spring, 0-18 credits, ABCF grading
May be repeated for credit*

PHY 581 Astrophysics

An introduction to some areas of astrophysics. Topics are selected from stellar structure and evolution, stellar atmospheres, interstellar matter, planetary atmospheres, galactic dynamics, high-energy astrophysics and cosmology, laboratory astronomical techniques.

0-3 credits, ABCF grading

PHY 582 Optics Rotation

Optical science students experience three to eight week periods in each of several appropriate research groups. At the end of each period a report is required that describes the topics studied or project done. May not be taken for credit more than two semesters.

*Fall and spring, 2 credits, ABCF grading
May be repeated twice for credit*

PHY 585 Special Study

Reading course in selected topics.

*Fall and spring, 0-18 credits, ABCF grading
May be repeated for credit*

PHY 595 Master's Degree Thesis Research

Independent research for master's degree students. Open only to those approved by individual faculty for thesis work.

*Fall and spring, 0-18 credits, ABCF grading
May be repeated for credit*

PHY 598 Graduate Seminar I

Special research topics centered on monographs, conference proceedings, or journal articles. Topics include solid-state physics, atomic physics and quantum optics. Required for all first-year graduate students.

Fall and spring, 0-1 credits, ABCF grading

PHY 599 Graduate Seminar II

Special research topics centered on monographs, conference proceedings, or journal articles. Topics include elementary particles, nuclear physics, galactic and extragalactic astronomy, and cosmology. Required for all first-year graduate students.

*Fall and spring, 0-1 credits, ABCF grading
May be repeated for credit*

PHY 600 Practicum in Teaching

This course provides hands-on experience in teaching. Activities may include classroom teaching, preparation and supervision of laboratory experiments, exams, homework assignments, and projects.

*Fall and spring, 0-2 credits, ABCF grading
May be repeated for credit*

PHY 610 Quantum Field Theory I

Quantization of relativistic fields: Lorentz

and gauge symmetries, relativistic spin, the S-matrix and scattering; the standard model; perturbation theory, renormalization and effective field theories; path integrals and relations to condensed matter physics.

Fall, 0-3 credits, ABCF grading

PHY 611 Quantum Field Theory II

Quantization of relativistic fields: Lorentz and gauge symmetries, relativistic spin, the S-matrix and scattering; the standard model; perturbation theory, renormalization and effective field theories; path integrals and relations to condensed matter physics.

Spring, 0-3 credits, ABCF grading

PHY 612 Theoretical Particle Physics

Applications of quantum field theory to interactions between elementary particles. Topics are chosen from perturbative quantum chromodynamics, the standard electroweak model, lattice field theory, grand unified models, supersymmetry, and current research problems.

Fall, 0-3 credits, ABCF grading

PHY 620 Relativity

General theory of relativity; tensor analysis, Einstein's field equations, experimental tests, black holes, gravitational waves, cosmology. May also include topics such as spinor methods, conformal invariance, and introduction to string theory or supergravity.

*Fall or spring, alternate years, 0-3 credits,
ABCF grading*

PHY 621 Advanced Quantum Field Theory

Proofs of renormalizability and unitarity on non-Abelian gauge theories using modern methods of Becchi-Rouet-Store-Tyutin (BRST) symmetry; descent equations for anomalies; classical instantons and their quantum corrections, including integration over zero modes; background field methods, other topics if time permits.

*Prerequisite: PHY 610/611 or equivalent
Fall or spring, alternate years, 0-3 credits,
ABCF grading*

PHY 622 String Theory I

This course is intended for graduate students who have familiarity with gauge and quantum field theory. Topics will be selected from: Free bosonic and spinning strings and heterotic and Green-Schwarz superstrings; conformal field theory; tree-level and one-loop amplitudes; partition functions; spacetime supersymmetry and supergravity; compactification and duality; winding and Kaluza-Klein modes; 11-dimensional supergravity; branes in supergravity; D-branes in string theory; T-duality; M-theory; complex geometry and Calabi-Yau manifolds; string field theory; other advanced topics if time permits.

*Prerequisite: PHY 610/611 or equivalent
Fall or spring, 0-3 credits, S/U grading*

PHY 623 String Theory II

This course is intended for graduate students who have familiarity with gauge and quantum field theory. Topics will be selected from: free bosonic and spinning strings and heterotic and Green-Schwarz superstrings; conformal field theory; tree-level and one-loop amplitudes; partition functions; spacetime super-

symmetry and supergravity; compactification and duality; winding and Kaluza-Klein modes; 11-dimensional supergravity; branes in supergravity; D-branes in string theory; T-duality; M-theory; complex geometry and Calabi-Yau manifolds; string field theory; other advanced topics if time permits.

*Prerequisite: PHY 610/611 or equivalent
Fall or spring, 0-3 credits, S/U grading*

PHY 650 Advanced Special Research

Advanced research under the direction of a faculty member.

*Prerequisite: Approval of the
Graduate Director*

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 651 Advanced Special Study

Advanced reading course in selected topics under the direction of a faculty member.

*Prerequisite: Approval of the
Graduate Director*

*Fall and spring, 0-3 credits, S/U grading
May be repeated for credit*

PHY 655 Advanced Graduate Seminar in Theoretical Physics

A weekly seminar on advanced theoretical concepts. The discussion starts with a graduate student presentation and it is conducted under the guidance of a faculty supervisor.

*0-3 credits, S/U grading
May be repeated for credit*

PHY 664 Astronomy Journal Club

Presentation of preliminary research results and current research problems by students and faculty. Required every semester of all astronomy graduate students.

*Fall and spring, 0-1 credits, S/U grading
May be repeated for credit*

Seminars

Each semester several seminars for advanced graduate students will be offered. These courses are intended primarily for students doing research in the area, although other students are welcome to enroll. Each course carries zero or one credit, and may be repeated for credit.

PHY 666 Cool Stars

A weekly seminar concentrating on observational and theoretical studies of cool stars and related objects. Emphasis is on ongoing research and recent results in this area. Speakers include faculty, students, and visitors. Topics anticipated in the near future include results from the Hubble Space Telescope and ROSAT. Students registering for one credit will be expected to present at least one seminar.

*Prerequisite: Permission of instructor
Fall and spring, 0-1 credits, S/U grading*

May be repeated for credit

PHY 668 Seminar in Astronomy

A weekly series of research seminars

presented by visiting scientists as well as by the faculty. Required every semester of all astronomy graduate students.

*Fall and spring, 0-1 credits, S/U grading
May be repeated for credit*

PHY 669 Nuclear Astrophysics Seminar

A weekly seminar concentrating on topics in nuclear astrophysics, including dynamics of supernova collapse, structure and evolution of neutron stars, equation of state, the role of neutrinos in nucleosynthesis, etc.

*Fall and spring, 0-1 credits, S/U grading
May be repeated for credit*

PHY 670 Seminar in Theoretical Physics

Fall and spring, 0-1 credits, S/U grading

PHY 672 Seminar in Elementary Particle Physics

Fall and spring, 0-1 credits, S/U grading

PHY 674 Seminar in Nuclear Physics

Fall and spring, 0-1 credits, S/U grading

PHY 676 Seminar in Solid-State Physics

Fall and spring, 0-1 credits, S/U grading

PHY 678 Atomic, Molecular and Optical Physics Seminar

Fall and spring, 0-1 credits, S/U grading

Special Topics Courses

The subject matter of each special topics course varies from semester to semester, depending on the interests of students and staff. Advanced topics will be discussed, particularly those that are of current interest. Each course carries from zero to three credits, and may be repeated for credit.

PHY 680 Special Topics in Theoretical Physics

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 681 Special Topics in Statistical Mechanics

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 682 Special Topics in Solid-State Physics

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 683 Special Topics in Radiation Physics

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 684 Special Topics in Nuclear Physics

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 685 Special Topics in Mathematical Physics

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 686 Special Topics in Elementary Particles

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 687 Topics in Biological Physics

The "Topics" courses in the 680 sequence do not have specific description, since the subject matter within the broadly defined topic may change from one semester to the next.

0-3 credits, ABCF grading

PHY 688 Special Topics in Astrophysics

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 690 Special Topics in Atomic and Optical Physics

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

PHY 698 Colloquium

*Fall and spring, 0-1 credits, S/U grading
May be repeated for credit*

PHY 699 Dissertation Research on Campus

Independent research for Ph.D. degree candidates.

Prerequisite: Must be advanced to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab

*Fall, spring, and summer, 0-6 credits,
S/U grading*

May be repeated for credit

PHY 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

*Fall, spring, and summer, 0-6 credits,
S/U grading*

May be repeated for credit

PHY 701 Dissertation Research off Campus—International

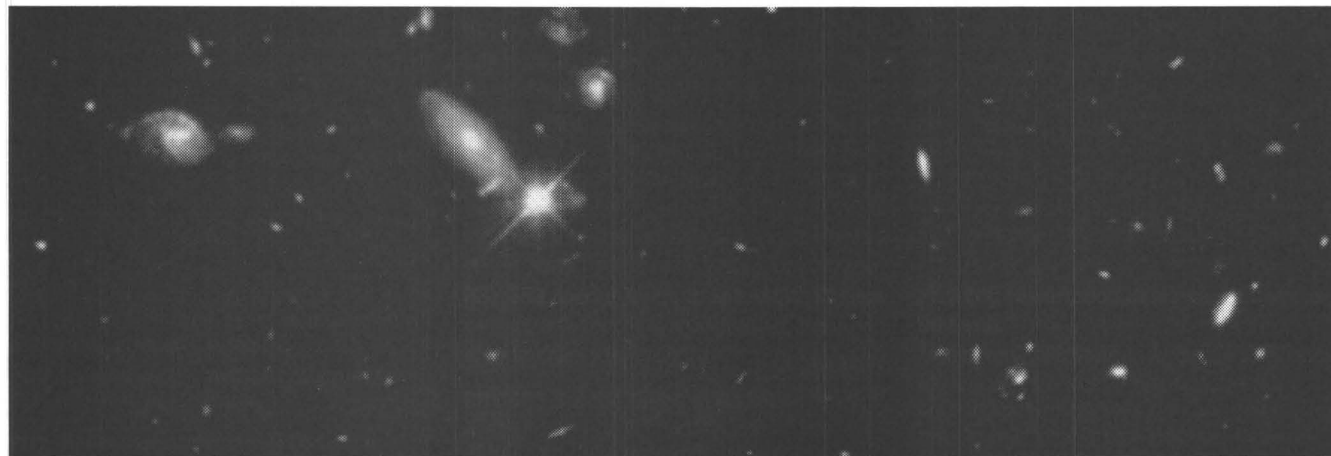
Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

*Fall, spring, and summer, 0-6 credits,
S/U grading*

May be repeated for credit

PHY 800 Summer Research

*May be repeated
0 credits*



Physiology and Biophysics (HBY)

Chairperson: Peter R. Brink, Basic Science Tower T-6, Room 140 (631) 444-2287

Graduate Program Director: Suzanne Scarlata, Basic Science Tower T-6, Room 145A (631) 444-3071

Graduate Program Administrator: Melanie Bonnette, Basic Science Tower T-6, Room 140 (631) 444-2299

Degree awarded: Ph.D. in Physiology and Biophysics

The Department of Physiology and Biophysics offers graduate studies leading to the Ph.D. degree. The department's faculty has a broad spectrum of research interests, with a major emphasis on understanding the mechanisms of regulation of cellular and organ function in mammalian systems.

Research Interests

There are five main research areas in the department:

1. Regulation of cell function and metabolism
2. Intercellular and intracellular signaling mechanisms
3. Biophysical studies of membranes
4. Cellular and systems electrophysiology and neurobiology
5. Cardiac pre-conditioning and arrhythmia prevention

The department strives to offer a broad spectrum of experimental approaches and a wide range of research interests, including membrane biophysics, cardiac physiology, membrane transport, and the molecular physiology of cell signaling systems. Thus for example, individuals who are interested in ion channels would be able to avail themselves of expertise in protein chemistry and DNA/RNA recombinant technology. For those students interested in the control of important membrane-bound regulatory enzymes (adenylate cyclase, phospholipase C), the presence of strong biophysical and systems physiology components in the department is a great advantage. The synergistic interaction of the various interest areas makes the department equal to more than the sum of its individual parts.

Some department faculty members are associated with the Health Sciences Center Diabetes and Metabolism Center and others participate in a University-wide program in Biophysics and in Biosystems. Most faculty have collaborative arrangements with other basic science and clinical departments. Through joint faculty appointments, students have access to the unique facilities of

Brookhaven National Laboratory and Cold Spring Harbor Laboratory, renowned research institutions located near Stony Brook.

Institute of Molecular Cardiology

Housed within the Department of Physiology and Biophysics, is the Institute of Molecular Cardiology. Since heart disease is still the number one cause of death in the United States, the Institute of Molecular Cardiology was established to bring a multidisciplinary group of basic scientists and clinical investigators together to focus on clinically relevant problems. Biophysicists, molecular biologists, cell biologists, engineers, and cardiovascular surgeons compose the group which currently works together investigating ischemic preconditioning, atrial and ventricular arrhythmias, cardiac contractility, and the development of stem-cell-based therapies.

Research Facilities

The Department of Physiology and Biophysics is well equipped with major research instrumentation for physiological, metabolic, and biochemical studies. The department houses a Molecular Biology Core that has scintillation counters, ultracentrifuges, amino acid analyzers, protein sequencers, and instrumentation for measuring ORD and CD, plus a wide variety of chromatographic, electrophoretic, and spectrophotometric equipment. Also available are a peptide synthesizer, mass spectrometer, and a laboratory for chemical synthesis of low-molecular-weight compounds. NMR instrumentation is available through collaboration with other departments. Tissue culture services, including monoclonal antibody production, are also available. Specialized equipment used in studies of membrane physiology and biophysics (e.g., membrane electrophysiology and patch-clamp studies on ion channels) are in routine use in several faculty laboratories. The department also houses an imaging center containing two confocal microscopes with image acquisition and processing systems.

Molecular Biology Core

The molecular biology core was established to provide students and faculty ready access to DNA/RNA recombinant technology. Departmental facilities include a 37-degree environmental room, a DNA synthesizer, and an automatic DNA sequencer, large orbital shakers, an array of incubators, DNA sequencing gel set ups (IBI), electrophoretic apparatus and power supplies, an IBI gel reader and a software package which permits the reading of DNA sequencing gels, a selection of restriction enzymes, and a number of cDNA expression libraries.

Molecular Modeling

Computational molecular modeling and visualization are valuable tools for the study of signal transduction systems and protein structure/function. Some current applications of faculty affiliated with our Biophysics Program include examining the physical factors involved in protein/membrane, protein/protein, protein/DNA interactions, studying the specificity of ligand and substrate binding to enzymes, and building models of proteins using domain structures from homologous proteins. The computational facilities are state-of-the-art: a network of Silicon Graphic Indy and Indigo workstations provides fast, high-resolution, interactive graphics. An eight-processor Sun supercomputer is used for intensive numerical analysis. Several departmental members have access to National Supercomputing Centers.

Computing Facilities

The department has more than 80 different computer systems ranging from high-end PCs and Macintosh systems to UNIX-based workstations. The department maintains a computer center for general use by all students, faculty and staff, which includes a number of high-end PCs, scanners, graphics workstations, laser and color printers, and data archival facilities. In addition, entering Ph.D. students are provided with a laptop computer for word processing, data

analysis, and network access. All computers are connected via Ethernet to a local area network, which in turn, is directly connected to the campus-wide network and the Internet. Thus, each computer has high-speed access to a number of file and print servers, campus main-frames, library systems for catalog and literature searches, campus administrative systems, and via the Internet, the Web and NSF-sponsored supercomputer facilities.

The Graduate Program in Physiology and Biophysics

Goals of the Program

The diverse nature of the department's research provides a unique environment for graduate study. The overall goal of our program is to prepare students to investigate complex physiological and biophysical problems that often bridge traditional academic boundaries. This requires sound training in a broad range of biological disciplines, plus experience in using the latest techniques in physiology, biochemistry, molecular biology, physics, applied mathematics, and computing.

To accomplish this goal, we recruit a relatively small number of students with diverse undergraduate training in the physical and biological sciences. Individual courses of study are then designed that reflect the background and goals of each student.

Overview of Curriculum

During the first year, all students take courses in cellular and organ systems physiology, biochemistry, and experimental design and data analysis methods. During the second-year, students select from a variety of advanced courses that suit their scientific interests, goals, and background. Students rotate through at least three faculty laboratories to gain research experience in the first two years. Students also participate, under faculty supervision, in the teaching of physiology. Upon completion of the qualifying examination and the selection of a faculty advisor for their research, the students then devote essentially all of their time to dissertation research.

There are three research concentrations available to graduate students: Cellular and Molecular Physiology, Biophysics, and Systems Physiology.

Cellular and Molecular Physiology

The goal of the Cellular and Molecular Physiology concentration is to train

students to investigate significant problems in human physiology using modern techniques of molecular and cellular biology. Students who choose this option generally have undergraduate degrees in biochemistry or biology, and will take advanced graduate classes in cellular and molecular biology and molecular genetics during their second year.

To increase the training and research opportunities available to our students, this program is affiliated with an interdepartmental program in Molecular and Cellular Biology (MCB). The MCB Program consists of approximately 100 faculty from 11 departments, as well as investigators at Cold Spring Harbor and Brookhaven National Laboratories. It offers several core courses taken by all graduate students in the biological sciences.

Biophysics

The goal of the Biophysics Studies concentration is to train students with strong backgrounds in physics and/or chemistry in modern biophysics. The program is an interdepartmental effort, consisting of 42 SUNY faculty, as well as scientists at Cold Spring Harbor and Brookhaven National Laboratories. Students who choose this option generally take advanced courses in biophysical chemistry, electrophysiology, or advanced biochemistry. Biophysics students can do rotations and dissertation research in the lab of any faculty member affiliated with the Biophysics Program.

Systems Physiology

The primary goal of the systems physiology concentration is to provide an educational framework that focuses on preparing students to attack complex integrative problems using interdisciplinary approaches and to work effectively as part of a multidisciplinary team. Areas of specialization in the department include systems neurophysiology, cardiovascular and microvascular physiology, and vision research. The systems physiology concentration is a central element in the BioSystems Group, which is an interdepartmental consortium of faculty members drawn from six departments, including Physiology and Biophysics, Biomedical Engineering, Neurobiology and Behavior, Pharmacological Sciences, Medicine, and Applied Mathematics and Statistics, as well as members from Brookhaven

National Laboratory and Cold Spring Harbor Laboratory.

The campus-wide nature of the BioSystems Group provides educational and research opportunities of exceptional depth and diversity, and the ability to accommodate students with a broad spectrum of interests and backgrounds. This diversity is reflected in the areas of specialization within the graduate programs. These include the general areas of systems physiology, cellular/molecular physiology, biophysics, biomedical engineering, neuroscience, pharmacology, computational biology, and signal processing.

Requirements and Procedures

Advisory Committee

After admission and until the student qualifies for candidacy, the student's education is directed by the departmental graduate committee. The committee will assess the student's background and preparation and will develop with each student an individual program of courses, laboratory experiences, and independent study. The committee is also responsible for monitoring student performance and assessing progress after the end of the first year.

Laboratory Experience

During the first two years, students usually rotate through three laboratories in the department, working on a problem in each. The duration of these rotations may vary, but should not exceed six months. At the end of each rotation, students will submit a written report of the aims and results, as well as the difficulties with the project.

Teaching Experience

Students are required to serve as teaching assistants for one semester in a course offered by the Department. This will fulfill the Teaching Practicum required for doctoral degrees awarded by the State University of New York.

Seminars and Journal Club

The Department hosts an extensive series of seminars on topics of direct and indirect relevance to research interests of the faculty. Seminars are given by faculty and visiting scientists, as well as by postdoctoral fellows and students. Students are required to attend all departmental seminars. Students are also required to participate in the student journal club, which meets weekly with a member of the faculty.

Course of Study

Graduate students are required to take the following courses: Cellular Physiology and Biophysics HBY 530, Human Physiology HBY 501 or Medical Physiology HBY 502, Biomembranes MCB 517, Graduate Biochemistry MCB 520, Statistical Analysis of Physiological Data HBY 561, Model-based Analysis of Physiological Data HBY 562, Teaching Practicum HBY 695, Research in Physiology and Biophysics HBY 591, Journal Club HBY 570, Seminar in Physiology and Biophysics HBY 690, and Thesis Research in Physiology and Biophysics HBY 699.

Students must also take at least four elective courses, with at least one course from the following two areas:

1. Biophysics: Signal Transduction HBY 553, Physiology of Excitable Cells HBY 552, and other courses with approval.

2. Cellular, Molecular, and Systems Physiology: Molecular Genetics HBM 503, Molecular and Physiological Basis of Drug Action HBH 533, Immunology HBP 533, Experimental Techniques in Systems Physiology HBY 564, Mathematical Models of Physiologic and Biophysical Systems HBY 565, and other courses with approval.

Students are also required to demonstrate competency in statistics and computer programming, either by formal undergraduate or graduate courses, or by passing an exam after self study.

Qualifying for Candidacy

The major purpose of the Qualifying Examination is to establish how well the student is able to acquire knowledge independently. To accomplish this, the student will be required to write, within a prescribed period of time, a formal research proposal with format and scope similar to a NIH Postdoctoral Fellowship Application.

The qualifying exam will be administered to all second-year students in the Spring semester. At that time, the Preliminary Examination Committee, in consultation with the student, will assign a topic, which may complement but not be directly in the area of the student's own major research interest. After one month, the student will distribute copies of the proposal to the faculty and present a seminar to the entire department describing the proposal. Following the seminar, the student will meet with the faculty to defend the

proposal. Successful completion of the exam and advancement to candidacy requires a two-thirds majority vote of the faculty.

Doctoral Program Committee

Upon qualification for candidacy, the student will select a faculty committee to provide guidance throughout the dissertation research. The thesis advisor will join (but will not chair) this committee. In consultation with the student, this committee will in due course set a schedule for written and/or oral accounts from the student regarding the progress of the work toward a dissertation. The committee will advise the student and the departmental chair when it is appropriate to assemble the committee for the dissertation defense.

Thesis Research Proposal

In consultation with the student's advisor and Doctoral Program Committee, the student is required to submit a written thesis proposal to the Doctoral Program Committee as soon as the direction and scope of the dissertation research project is established. The student is also required to present a seminar describing his proposal to the entire department and to defend the proposal in a closed meeting with the Doctoral Program Committee. The approved thesis proposal should be submitted within one year after advancement to candidacy. Students may petition the Graduate Program Committee for an extension.

Dissertation Defense

A Dissertation Defense Committee is appointed by the dean of the Graduate School, and is to include at least four faculty members, of whom at least one must be from outside the department. The thesis advisor may be in attendance, but is without vote.

Doctoral Thesis

The thesis will be written in the form of one or more scientific publications in accordance with the guidelines of the Graduate School. The Dissertation Defense Committee evaluates the completed thesis and decides whether an oral dissertation defense, open to the entire faculty, is to be required prior to final certification of successful completion of the program. If this oral defense is waived, the student is to present the thesis orally at an informal, open colloquium.

Time Limits

All requirements must be completed within seven years.

Admission

For admission to the Ph.D. program in physiology and biophysics the following, in addition to the minimum Graduate School requirements, are normally required:

A. A four-year undergraduate degree including the following courses: one year of calculus, one year of general biology with laboratory, one year of physics using calculus, and one year of chemistry. Training in the following areas is strongly recommended: organic chemistry, biochemistry, and physical chemistry. Courses in genetics, cell biology, and biostatistics will also be useful. In exceptional circumstances, permission may be granted to correct deficiencies in undergraduate training during the first year of graduate study.

B. Three letters of reference are required.

C. The Graduate Record Examination (GRE) General Test is required. Instructions on reporting scores to this campus will be included in the application materials. So that the scores will be available for a timely admission decision, the test should be taken no later than January. The deadline for receipt of applications for admission in the fall is March 1. The TOEFL examination is also necessary for foreign students; the minimum acceptable score is 550.

D. Acceptance by both the Department of Physiology and Biophysics and the Graduate School is required.

E. GPA of 3.0 or higher is required.

Students may be admitted provisionally under the following circumstances. If TOEFL has not been taken or a score of 550 was not attained, proficiency in English can be demonstrated by one of the following methods:

1. Prior attendance at an English-speaking educational institution for at least two years;

2. Receipt of a score of 80/85 on ALI/GU test (American Language Institute of Georgetown University);

3. Certification from an English Language Institute before arrival at Stony Brook;

4. Successful English language interview upon arrival at Stony Brook.

Faculty

Professors

Benjamin, William B., M.D., 1959, Columbia University: Endocrinology; mechanism of insulin action.

Brink, Peter R., *Chairperson*. Ph.D., 1976, University of Illinois: Physiology and biophysics of junctional and excitable membranes.

Carter, Carol¹⁷, Ph.D., 1972, Yale University: Assembly of the human deficiency virus (HIV).

Cohen, Ira S., M.D., Ph.D., 1974, New York University: Electrophysiology of the heart; synaptic physiology.

Dilger, James P.⁸, Ph.D., 1980, Stony Brook University: Neuromuscular junction; ion channels in nerve membranes.

Edelman, Norman H.², *Vice President, Health Sciences Center*. M.D., 1961, New York University: Role of the brain in hypoxia in the control of breathing.

Fajer, Jack⁷, Ph.D., 1962, Brandeis University: Electron transfer in photosynthetic and enzymatic reactions.

Johnson, Roger A., Ph.D., 1968, University of Southern California: Mechanism of hormone action; inter- and intracellular regulation of membrane-bound hormone-sensitive enzymes.

Krukenkamp, Irvin B.³, M.D., University of Maryland, 1978: Surgical and pharmacologic precondition and atrial arrhythmias.

Mathias, Richard T., Ph.D., 1975, University of California, Los Angeles: Electrophysiology of cardiac muscle; volume regulation in the lens.

McLaughlin, Stuart, Ph.D., 1968, University of British Columbia, Canada: Biophysics of membranes.

Mendell, Lorne¹, Ph.D., 1965, Massachusetts Institute of Technology: Physiology and modifiability of synapses in the spinal cord.

Miller, W. Todd, Ph.D., 1988, Rockefeller University: Protein structure and function; molecular mechanisms of signal transduction.

Moore, Leon C., Ph.D., 1976, University of Southern California: Renal physiology.

Rosen, Michael R.¹⁶, M.D., State University of New York, Downstate, 1964: Development cardiac electrophysiology.

Sachs, John², M.D., 1960, Columbia University: Sodium potassium pump in the red cell.

Said, Sami, M.D., 1951, University of Cairo, Egypt: Vasoactive intestinal peptides (VIP); acute lung injury.

Scarlata, Suzanne, *Graduate Program Director*. Ph.D., 1984, University of Illinois: Biophysics of signaling proteins.

Smith, Steven O.¹⁴, Ph.D., 1985, University of California, Berkeley: Molecular mechanisms of signal transduction.

Stephano, George¹⁵, Ph.D., 1973, Fordham University: Opiate neurovascular immunology.

Van der Kloot, William G., *Distinguished Emeritus*. Ph.D., 1952, Harvard University: Cellular neurophysiology.

Associate Professors

Cabot, John B.¹¹, Ph.D., 1976, University of Virginia: Central nervous system control of cardiovascular function.

Chon, Ki H.¹⁸, Ph.D., 1993, USC: Biomedical signal processing; identification and modeling of physiological systems and medical instrumentation.

Clausen, Chris, Ph.D., 1979, University of California, Los Angeles: Electrical properties of transporting epithelia.

Frame, Mary¹⁸, Ph.D., 1990, University of Missouri: Microcirculation; tissue engineering; nanofabrication.

Konopka, James B.¹⁷, Ph.D., 1985, UCLA: G protein-coupled receptor signal transduction and yeast morphogenesis.

Lowe, Scott W.⁶, Ph.D., 1994, Massachusetts Institute of Technology: Molecular mechanisms of apoptosis in cancer.

McKinnon, David¹, Ph.D., 1987, Australian National University: Control of ion channel expression.

Smaldone, Gerald C.², M.D., Ph.D., 1975, New York University: Respiratory physiology.

Solomon, Irene C., Ph.D., 1994, University of California, Davis: Neural control of respiratory motor output and fast oscillatory rhythms.

Spector, Ilan, Ph.D., 1967, University of Paris, France: Electrophysiology of nerve and muscle cell lines; ion channels; neurotoxins.

White, Thomas W., Ph.D., 1984, Harvard University: Biology of cell-to-cell communication and gap junction.

Assistant Professors

Bowen, Mark, Ph.D., 1998, University of Illinois, Chicago: Molecular aspects of signal transduction.

Entcheva, Emilia¹⁸, Ph.D., 1998, Memphis: Cardiac cell function.

Nassar, Nicolas, Ph.D., 1992, University Joseph Fourier and EMBL: Protein-protein interactions.

Research Faculty

Cameron, Roger H., *Assistant Professor*. Ph.D., 1990, Stony Brook University: Electron microscopy; pharmacology of plasma cells secretion.

El-Maghrabi, Raafat, *Associate Professor*. Ph.D., 1978, Wake Forest University: Enzyme regulation; hormonal control of metabolism.

Gao, Junyuan, *Assistant Professor*. Ph.D., 1994, Stony Brook University: Sodium potassium pump current in cardiac myocytes.

Hod, Yaacov, *Associate Professor*.¹² Ph.D., 1977, Israel Institute of Technology: Hormonal regulation of gene transcription.

Kumari, Sindhu, *Assistant Professor*. Ph.D., 1988, Madurai Kamaraj University, India: Biochemical and molecular characterization of gap junction channels and sodium potassium pump.

Pentyala, Srinivas N., *Assistant Professor*.⁵ Ph.D., 1989, Sri Venkateswara University: Molecular mechanics of the action of anesthetics.

Rebecchi, Mario J., *Associate Professor*.⁵ Ph.D., 1984, New York University School of Medicine: Signal transduction in mammalian cells.

Rosati, Barbara, *Assistant Professor*. Ph.D., 2000, Milan, Italy: Transcriptional regulation of ion channel genes in the heart.

Sutherland, John C., *Senior Biophysicist*.⁷ Ph.D., 1967, Georgia Institute of Technology: Biological effects of ultraviolet radiation on DNA; spectroscopy; synchrotron radiation.

Valiunas, Virginijus, *Assistant Professor*. Ph.D., 1992, Kaunas Medical University, Lithuania: Gap junction; intercellular communication and cardiac electrophysiology.

Varadaraj, Kulandaiappan, *Assistant Professor*. Ph.D., 1991, Madri Kamaraj University: Lens membrane proteins and gap junctions.

Wang, Hsien Yu, *Associate Professor*. Ph.D., 1989, Stony Brook University: Signal transduction and development.

Biophysics Program Affiliated Faculty

Adams, Paul R., *Professor, Howard Hughes Medical Institute and Department of Neurobiology and Behavior*. Ph.D., 1974, University of London, England: Electrical activity in the nervous system.

Bauer, William R., *Professor, Department of Microbiology*. Ph.D., 1968, California Institute of Technology: Energetic characterization of DNA and DNA-protein interactions.

De los Santos, Carlos, *Associate Professor, Department of Pharmacology*. Ph.D., 1987, University of Buenos Aires, Argentina: NMR structural studies of nucleic acids and proteins.

Eisenberg, Moises, *Professor, Department of Pharmacological Sciences*. Ph.D., 1972, California Institute of Technology: Computer-assisted modeling of biomolecules.

Grollman, Arthur P., *Distinguished Professor, Department of Pharmacological Sciences*. M.D., 1959, Johns Hopkins University: Chemical carcinogenesis and mutagenesis.

Jacobsen, Chris J., *Professor, Department of Physics*. Ph.D., 1988, Stony Brook University: Soft X-ray microscopy of cellular structure and materials structure.

Joshua-Tor, Leemor, *Assistant Investigator, Cold Spring Harbor Laboratory*. Ph.D., 1991, The Weizmann Institute of Science: Structural biology; X-ray crystallography; molecular recognition; transcription; proteases.

Kirz, Janos, *Professor, Department of Physics*. Ph.D., 1963, University of California, Berkeley: Microscopy and microanalysis of cellular architecture with soft X-rays.

Krainer, Adrian R., *Professor, Cold Spring Harbor Laboratory*. Ph.D., 1986, Harvard University: Mechanisms and regulation of messenger RNA splicing in human cells.

Lennarz, William J., *Professor, Department of Biochemistry*. Ph.D., 1959, University of Illinois: Biosynthesis and function of glycoproteins in development.

London, Erwin, *Professor, Department of Biochemistry*. Ph.D., 1979, Cornell University: Membrane lipid-protein interactions; protein toxin structure and function.

Malbon, C., *Professor, Department of Pharmacology*. Ph.D., 1976, Case Western Reserve University: Elucidating the genetic basis of developmental and metabolic diseases.

Matthews, Gary, *Professor, Department of Neurobiology and Behavior*. Ph.D., 1975, University of Pennsylvania: Cellular biophysics of electrical signals in the retina.

Metcalf, Harold J., *Distinguished Teaching Professor, Department of Physics*. Ph.D., 1967, Brown University: Physical analysis of biological systems.

Raleigh, Daniel P., *Professor, Department of Chemistry*. Ph.D., 1988, Massachusetts Institute of Technology: Experimental studies of protein folding and amyloid formation.

Rubin, Clinton T., *Professor, Department of Orthopaedics*. Ph.D., 1983, Bristol University: Cellular mechanisms responsible for adaptation in bone.

Sampson, Nicole S., *Professor, Department of Chemistry*. Ph.D., 1990, University of California, Berkeley: Enzyme mechanisms and protein structure-function relationships.

Setlow, Richard, *Professor, Department of Biology, and Senior Scientist, Brookhaven National Laboratory*. Ph.D., 1947, Yale University: DNA damage and repair.

Simon, Sanford R., *Professor, Departments of Biochemistry and Pathology*. Ph.D., 1967, Rockefeller University: Interaction of neutrophil elastase with connective tissue.

Stell, George R., *Distinguished Research Professor, Departments of Chemistry and Mechanical Engineering*. Ph.D., 1961, New York University: Theory of the osmotic properties of ionic solutions and membranes.

Sussman, Joel, *Professor, Department of Biology, Brookhaven National Laboratory*. Ph.D., 1972, Massachusetts Institute of Technology: Structure and function of acetylcholinesterase and nucleic acids; protein data bank.

Sutherland, John C., *Senior Scientist, Department of Biology, Brookhaven National Laboratory*. Ph.D., 1967, Georgia Institute of Technology: Ultraviolet photochemistry and spectroscopy of DNA.

Tonge, Peter J., *Professor, Department of Chemistry*. Ph.D., 1986, University of Birmingham, England: Enzyme mechanisms in antitubercular drugs and Alzheimer's disease.

Wong, Stanislaus, *Assistant Professor, Department of Chemistry*. Ph.D., 1999, Harvard University: Fundamental structure correlations in unique nanostructures.

Xu, Rui-Ming, *Assistant Investigator, Cold Spring Harbor Laboratory*. Ph.D., 1990, Brandeis University: X-ray crystallography; protein-RNA interactions; gene expression; cell cycle.

- 1) Joint appointment, Department of Neurobiology and Behavior
- 2) Joint appointment, Department of Medicine
- 3) Joint appointment, Department of Surgery
- 4) Joint appointment, Department of Pediatrics
- 5) Joint appointment, Department of Anesthesiology
- 6) Joint appointment, Cold Spring Harbor Laboratory
- 7) Joint appointment, Brookhaven National Laboratory
- 8) Joint appointment, Department of Applied Mathematics and Statistics
- 9) Joint appointment, Department of Orthopedics
- 10) Joint appointment, Veterans Administration Hospital
- 11) Joint appointment, North Shore University Hospital
- 12) Joint appointment, Department of Urology
- 13) Joint appointment, SUNY Old Westbury
- 14) Joint appointment, Department of Biochemistry and Cell Biology
- 15) Joint appointment, Department of Biology, University of Tulsa, Oklahoma
- 16) Joint appointment, Department of Pharmacology, College of Physicians and Surgeons, Columbia University
- 17) Joint appointment, Department of Molecular Genetics and Microbiology
- 18) Joint appointment, Department of Biomedical Engineering

Degree Requirements

In addition to the minimum Graduate School requirements, the following are required:

A. Completion of HB501 or HB502, HB530, HB561, HB562, MCB 517, MCB 520, HB570, HB591, HB590, HB599, HB595, and 12 credits of elective courses.

B. Satisfactory completion of the preliminary examination at the end of the second year of study.

C. Submission of a thesis research proposal by the end of the third year.

D. Participation in the teaching practicum.

E. Submission of an approved dissertation and successful oral defense.

F. Completion of all requirements within seven years.

Courses

HB501 Physiology

Introduces normal function of human tissues and organs and their regulation by nervous and endocrine systems. Emphasizes the organization and function of physiological control systems and the maintenance of a constant internal environment.

Prerequisites: Fully matriculated graduate students, with permission of instructor; admission to graduate Health Sciences Center program
Fall, 4 credits, ABCF grading

HB502 Medical Physiology

A graduate level approach to the physiology of the organ systems is addressed in a lecture format with emphasis on problem solving. Relevant clinical correlations are addressed at the end of each block insofar as they illustrate how symptoms and signs of disease result from disordered physiology. Organ Systems addresses the structure and function of the cardio vascular, respiratory, renal, gastrointestinal, endocrine, skeletal, reproductive, and integumentary systems.

Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Spring, 4 credits, ABCF grading

HB530 Cellular Physiology and Biophysics

Cellular structure and function. Topics include ion channels excitability, transport, energetics and metabolism, contraction, secretion, and communication within and between cells. Emphasizes quantitative analysis of cellular processes. Crosslisted with BME 545.

Prerequisites: Undergraduate physics, physical chemistry, biology, calculus, or permission of instructor; admission to graduate Health Sciences Center program
Fall, 4 credits, ABCF grading

HB531 Organ Systems

A graduate-level introduction to the physiology of the organ systems with ultrastructural correlations. Ultrastructural correlations are demonstrated in a laboratory setting using histological preparations in conjunction with electron micrographs illustrating the relevant ultrastructure needed to understand the normal functioning of tissues and organs. The physiology of the major organ systems is addressed in a lecture format with the emphasis on problem solving. Relevant clinical correlations are addressed at the end of each block in so far as they illustrate how symptoms and signs of disease result from disordered physiology. Organ Systems addresses the structure and function of the cardiovascular, respiratory, renal, gastrointestinal, endocrine, skeletal, reproductive, and integumentary systems.

Prerequisites: Admission to medical or dental school and permission of instructor; admission to graduate Health Sciences Center program
Spring, 8 credits, ABCF grading

HBY 553 Signal Transduction

The course will emphasize fundamental concepts in signal transduction (e.g., membrane-protein and protein-protein interactions, amplification of signals), and individual lectures will apply these concepts at each stage of cell signalling from the cell surface to the nucleus, where signal transduction leads to specific gene expression. Crosslisted with HBY 558 or HBH 553.

Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HBY 557 Advanced Physiology

This course is designed to introduce students to integrative approaches in biomedical research. Emphasis will be placed on the primary physiological concepts of control, communication, signal processing, metabolism and replication.

Prerequisites: Systems physiology, biochemistry, and permission of instructor; admission to graduate Health Sciences Center program
Fall, 3 credits, ABCF grading

HBY 561 Statistical Analysis of Physiological Data

Statistical methods useful in analyzing common types of physiological data. Topics include probability, data distributions, hypothesis testing with parametric and non-parametric methods, ANOVA, regression and correlation, and power analysis. Emphasis is on experimental design and appropriate, efficient use of statistical software.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, 1 credit, ABCF grading

HBY 562 Model-based Analysis of Physiological Data

The analysis of common biochemical and physiological data by non-linear regression of data models and biophysical models of physiological and biochemical processes. Examples include binding kinetics, compartmental mass transfer and spectral analysis.

Prerequisite: HBY 561; admission to graduate Health Sciences Center program
Spring, 1 credit, ABCF grading

HBY 563 Measurement and Analysis in Physiological Research

The acquisition and analysis of data arising from common biochemical and physiological measurements. Topics include computer-based data acquisition and processing, densitometry, microscopy and image analysis and processing. Emphasis is on experimental design and strategies for optimizing signal-to-noise ratio of measurements.

Prerequisites: HBY 561, HBY 562; admission to graduate Health Sciences Center program
Spring, 1 credit, ABCF grading

HBY 564 Experimental Techniques in Systems Physiology

A series of lectures and laboratory exercises designed to introduce students to in vivo experimental techniques used in systems physiology. Emphasis will be placed on the ethical use

of rodents in biomedical research and the measurement of physiological variables. Data acquisition and analysis procedures used in cardiovascular, respiratory, neural, and renal physiology will also be covered.

Spring, 2 credits, ABCF grading

HBY 565 Mathematical Models of Physiological and Biophysical Systems

An introduction to mathematical modeling of cell and tissue function. Topics include the derivation and numerical solution of models of cell homeostasis, membrane transport and excitability, and cell signaling and metabolism. Grading is based on problems, student presentations, and completion of a modeling project.

Spring, 3 credits, ABCF grading

HBY 570 Student Journal Club

Graduate student presentation on a selected topic with faculty consultation.

Prerequisite: Limited to students of the Physiology and Biophysics program; admission to graduate Health Sciences Center program
1 credit, ABCF grading
May be repeated for credit

HBY 590 Special Topics in Physiology and Biophysics

Students seminars on topics to be arranged through consultation with faculty members.

Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
Spring, 1 credit, S/U grading

HBY 591 Physiology and Biophysics Research

Original investigation under the supervision of a staff member.

Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
1-12 credits, ABCF grading
May be repeated for credit

HBY 690 Seminar in Physiology and Biophysics

Seminars and discussions on major topics in physiology and biophysics by students, staff, and visiting scientists.

Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
1 credit, S/U grading
May be repeated for credit

HBY 695 Practicum in Teaching in Physiology and Biophysics

Practical experience and instruction in the teaching of physiology and biophysics carried out under faculty orientation and supervision.

Prerequisite: Admission to graduate Health Sciences Center program
1 credit, ABCF grading
May be repeated for credit

HBY 699 Dissertation Research on Campus

Original (thesis) research undertaken with the supervision of a member of the staff.

Prerequisite: Advancement to candidacy (G5); permission of thesis advisor; major

portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab; admission to graduate Health Sciences Center program
1-12 credits, ABCF grading
May be repeated for credit

HBY 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an international advisor; admission to graduate Health Sciences Center program
1-9 credits, S/U grading
May be repeated for credit

HBY 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside of the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by the mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an international advisor; admission to graduate Health Sciences Center program
1-9 credits, S/U grading
May be repeated for credit

HBY 800 Full-Time Summer Research

Full-time laboratory research projects supervised by staff members.

Prerequisite: Permission of instructor; full-time graduate status; admission to graduate Health Sciences Center program
S/U grading
May be repeated for credit



Political Science (POL)

Chairperson: Jeffrey Segal, Ward Melville Social and Behavioral Sciences Building S-711 (631) 632-7667

Graduate Program Director: Charles Taber, Ward Melville Social and Behavioral Sciences Building (631) 632-7659

Graduate Coordinator: Lee Stanley, Ward Melville Social and Behavioral Sciences Building S-703 (631) 632-7667

Degrees awarded: M.A. in Political Science; M.A. in Public Policy; Ph.D. in Political Science

Ph.D. Program in Political Science

The Ph.D. program in Political Science, in the College of Arts and Sciences, is characterized by several distinct features:

A. Three areas of specialization:

1. Political Psychology/Behavior
2. Political Economy and Public Policy
3. American Politics

B. Close student/faculty interaction.

C. An emphasis on professional training of research-oriented students and the production of professional-quality articles and conference papers by Ph.D. students.

Political Psychology/Behavior

The doctoral concentration in political psychology/behavior applies contemporary psychological theories, concepts, and research methods to the study of political behavior. Students are trained in topics and methods associated with psychology as well as political science. Methodological concerns focus on experimentation and survey research. In addition to formal training in methods appropriate to the psychological study of political behavior, students are apprenticed to ongoing research projects throughout their course of training. Students become familiar with the department's extensive and well-equipped laboratories and the regular subject pool. Opportunities are also available to take part in ongoing survey research projects.

The substantive interests of the faculty in this area include voter decision-making processes, political socialization, political values and beliefs, the mass media, political cognition, group influence, and public opinion.

Political Economy and Public Policy

The concentration in political economy and public policy emphasizes the interaction between politics and the institutions (both public and private) that

shape economic policies. Students choosing this concentration analyze important issues by focusing on decision making and organizational behavior as shaped by individual incentives and institutional structures. In addition to the foundation course in public policy required of all students, elective seminars in this field include policy evaluation, organizational decision making, bureaucracy, regulation, institutional analysis, and urban politics.

The faculty have published research on issues such as the economic development of metropolitan areas, the political economy of suburbs, political controls over regulatory bureaucracies, and citizen responses to tax policies. A sample of other ongoing research projects in which incoming students may become involved include the effect of market-like incentives in school choice, subsidy flows in the European Union, the role of social capital in environmental decision-making, and regulation of business by state governments. The economic approach is also used to investigate other political processes such as voting, party competition, and agenda setting.

American Politics

The American politics concentration provides a broad perspective on national political institutions and processes, with particular emphases on elections and courts. Courses focusing on political parties and elections, the legislative process, the American judiciary, electoral behavior, American political ideology, and public choice theory are offered. Students become familiar with the kinds of quantitative and formal analysis techniques most often applied to the study of American politics. Seminar papers allow students to go into detail on topics of special interest.

Members of the faculty are currently doing research on congressional and Supreme Court decision making, the role of economic forces in American national elections, voting in congressional elections, gender issues, and the dynamics of American public opinion.

Methodology

Since we believe that a strong background in research methods is essential for political scientists interested in empirical research, we provide a rigorous training in the application of statistical methods and formal models to political analysis. Coursework in methods includes introductory training in research design and elementary statistics, as well as more advanced work in statistical analysis, econometrics, time series analysis, and measurement. The department recognizes that many undergraduates in political science come to graduate school without much background in statistics and math. Therefore, our courses therefore start at an introductory level and slowly develop the skills necessary to do publishable research in political science. In addition to the classroom work, these courses all involve analysis of actual data on personal computers. We believe, however, that it is the application of research methods, first as part of faculty and class research projects and then in a student's own dissertation research, that makes a qualified researcher with the skills required for success in research and academic careers.

Research Facilities

The department has extensive research facilities equal to any in the country, most located on the same floor with faculty and student offices. Students routinely use the conveniently located computer facilities for writing and analysis as part of their professional training. The Social and Behavioral Sciences Data Laboratory on our floor provides access to state-of-the-art personal computers tied to a local computer network and providing connections to all computers on campus. The Stony Brook Instructional Networked Computer site one floor below the department provides additional personal computers for classroom and research work. In addition, our data lab maintains a library of reference materials, holds classes on specific software packages, provides access to

the extensive data archives available through the Inter-University Consortium for Political and Social Resources, and employs computer consultants to help with student research projects. All of the resources of the data lab are available to graduate students.

The laboratories for political psychology research are designed for the experimental study of political behavior. One set of labs contains computerized equipment to monitor, control, record, and analyze multiple responses from subjects. Much of the recent work focuses on information processing and decision making—how citizens interpret, use, and recall political information. The other set of labs contains several large viewing rooms and 16 separate interview rooms for running multiple experiments. They are equipped with video cameras, editing equipment, and monitors required for state-of-the-art experimental studies of media impact on political beliefs and behavior. Students may also take advantage of our modern, fully equipped Survey Center for public opinion studies using computer-assisted, telephone interviewing.

Admission

The Department of Political Science Doctoral Program admits only students who intend to complete the Ph.D., although students are eligible to receive the M.A. Applicants for admission to the Ph.D. program in political science must meet the following requirements:

A. Submission of Graduate Record Examination (GRE) Test scores (verbal, quantitative, and analytic);

B. Prior training that includes basic work in at least one of the following:

1. Political science
2. Psychology
3. Mathematics or statistics
4. Economics or sociology

C. A bachelor's degree with at least a B average in the major subject;

D. Three letters of recommendation from instructors or academic advisors;

E. In cases where the departmental admissions committee deems it desirable, personal interviews with departmental representatives may be necessary.

Acceptance by both the Department of Political Science and the Graduate School is required.

Faculty

Distinguished Professors

Lodge, Milton G., *Emeritus*. Ph.D., 1967, University of Michigan: Political psychology; political cognition.

Schneider, Mark, Ph.D., 1974, University of North Carolina, Chapel Hill: Urban public policy; urban service delivery; administration and public policy.

Segal, Jeffrey A., *Chairperson*. Ph.D., 1983, Michigan State University: Judicial process and behavior; research methods; American politics.

Professors

Feldman, Stanley, Ph.D., 1978, University of Minnesota: American politics, emphasizing political psychology and socialization; public opinion; voting behavior and participation; methodology.

Koppelman, Lee E., D.P.A., 1970, New York University: Comprehensive regional and urban planning; environmental policy; American federalism and intergovernmental relations; regional policy analysis; coastal zone planning.

Myers, Frank, Ph.D., 1965, Columbia University: Comparative politics; political theory.

Norpoth, Helmut, Ph.D., 1974, University of Michigan: Electoral behavior; public opinion

Salins, Peter D., *SUNY Provost and Vice Chancellor for Academic Affairs*. Ph.D., 1969, Syracuse University: Public policy; regional planning.

Associate Professors

Cover, Albert D., Ph.D., 1976, Yale University: American politics: congressional elections.

Huddy, Leonie, Ph.D., 1987, University of California, Los Angeles: Political attitudes; groups and politics; sociopolitical gerontology; women and politics.

Lavine, Howard, Ph.D., 1994, University of Minnesota: Political psychology; cognition.

Taber, Charles S., *Graduate Program Director*. Ph.D., 1991, University of Illinois: International relations; political psychology; foreign policy; conflict modeling; computational modeling (AI).

Assistant Professors

Basinger, Scott J., Ph.D., 2000, University of California, San Diego: Game theory; American political parties; American political development.

Lahav, Gallya, Ph.D., 1995, City University of New York: Political psychology; comparative politics.

Lebo, Matthew, Ph.D., 1999, University of North Texas: Political parties; public opinion; elections; political methodology.

Leventoglu, Bahar, Ph.D., 2000, University of Rochester: Democratization, comparative political institutions, international political organizations.

Rose, Shana, Ph.D., 2005, Harvard University: Political economy; public policy; American politics.

Number of teaching, graduate, and research assistants, fall 2005: 22

Degree Requirements Requirements for the M.A. Degree

In addition to the minimum requirements of the Graduate School, the department requires all candidates to complete 30 credits of approved graduate coursework in which a grade of B or higher has been received.

M.A. in Public Policy

The M.A. in Public Policy prepares students for entry and mid-level analytic and management positions in state, local, and federal agencies, in non-profit organizations that interact with government, and in corporations that deal with public policy. Courses are taught by members of the department, as well as by outstanding local practitioners affiliated with the Center for Regional Policy Studies, headed by Dr. Lee Koppelman.

Admission

Applicants should have an undergraduate Grade Point Average of 3.0 (out of 4.0), and Graduate Record Examination (GRE) scores indicating a potential for success in a rigorous graduate program. Consideration will also be given to letters of recommendation and work experience.

Program Tracks

M.A. Track

This track requires the completion of 30 credits of graduate coursework, typically distributed as follows:

Fall:

POL 501 Introductions to Statistics for Public Policy (3 credits)

POL 535 Public Policy Analysis and Evaluation (3 credits)

POL 509 Public Budgeting and Finance (3 credits)

POL 537 Administrative Law for Public Analysts (3 credits)

or

500-level elective approved by Graduate Director (only one elective permitted outside of Department of Political Science)

Spring:

POL 502 Intermediate Statistics for Public Policy (3 credits)

POL 536 Public Management and Organizational Behavior (3 credits)

POL 510 Personnel Systems for Public Policy (3 credits)

POL 534 Intergovernmental Relations and Policy Delivery (3 credits)

or

500-level elective (as approved)

Summer:

POL 599 Internship in Public Policy (6 credits)

or

POL 597 Master's Paper (6 credits)

Full-time students without past significant full-time public policy work experience are required to take the Internship in Public Policy. Part-time students can fulfill their capstone requirement by the Internship (POL 599), the M.A. Paper (POL 597), or two additional elective courses approved by the graduate program director.

B.A./M.A. Track

Stony Brook University students currently enrolled with a major in Political Science are eligible for the five year B.A./M.A. program, in which up to six graduate credits are earned during the senior year, while also fulfilling the B.A. requirements. Consult the Undergraduate Bulletin for B.A. requirements. Upon admission to the program, the following two courses (or others approved by the graduate program director) are taken in the senior year and also satisfy the upper level undergraduate elective requirement:

POL 535 Public Policy Analysis and Evaluation (3 credits)

POL 536 Public Management and Organizational Behavior (3 credits)

The student then completes the remaining graduate requirements during the fifth year of full-time study.

Requirements for the Ph.D. Degree

Candidates must meet the general requirements for the Ph.D. degree set by the Graduate School. Departmental requirements are as follows:

A. Core Courses

Students take four core courses:

1. POL 600 Research Project
2. POL 601 Public Policy and Political Economy
3. POL 605 American Government
4. POL 608 Political Psychology

B. Methods

Students are expected to master the methods necessary to engage in scholarly work:

1. All students take a three-course sequence in mathematics, statistics, and research methods (POL 602, 603, 604).

2. All students are required to take at least one advanced methods course either in this department or in a cognate field (e.g., economics). The student's choice of advanced elective(s) is decided in conjunction with the student's advisor.

3. In addition to requirements 1 and 2 above, political psychology students take POL 610, a graduate-level course in experimental design. Political economy and American Politics students must take POL 613, Public Choice.

4. Students who have attended the ICPSR Summer Program in Quantitative Methods at the University of Michigan can have the advanced elective requirement waived.

C. Electives

Students take a minimum of four advanced seminars in their area of specialization and three in their minor area. The seminars are typically at the 600 level and can be within the department or can be in cognate fields such as psychology, economics, or applied math. The course of study is selected by the student in consultation with his or her advisor and must be approved by the graduate program director.

D. Teaching and Research Apprenticeship

To ensure that all students become proficient in teaching and research, students work with the faculty on an individual basis. Funded students participate in faculty research projects and assist in teaching courses. Advanced students then prepare and teach their own undergraduate classes.

E. Evaluation

Graduate students in the Ph.D. program are formally evaluated at the end of

each semester, based on grades received in the program and on evaluations by faculty familiar with the student's work.

The evaluation committee's charge is to make one of the following three possible determinations with regard to the student's progress: (1) recommend continuation of graduate study toward the Ph.D., (2) recommend that the student be allowed to continue toward a terminal M.A. but not to continue in the Ph.D. program, or (3) recommend that the student not be permitted to enroll in additional graduate courses in the department.

The evaluation also serves as the basis for the decision as to whether the student is to receive financial support during subsequent semesters of graduate work.

F. Qualifying Examinations

1. **Timing of Examinations:** Students making normal progress toward the Ph.D. should anticipate taking qualifying examinations following the second year of coursework. Examinations in three fields compose the doctoral qualifying examinations.

2. **Examination Fields:** The department's policy is to allow students to take exams only in those areas in which its faculty strengths allow in-depth training, including:

- a. Methods
- b. American Politics
- c. Political Economy and Public Policy
- d. Political Psychology/Behavior

All students are required to take the methods exam. Students then prepare two of the three other substantive areas for written examination.

3. **Preparation and Evaluation of Examinations:** The graduate program director appoints a committee (with a designated committee chairperson) responsible for each examination field. The committee prepares the written examination, providing sufficient options for questions on which students may write. The committee members read the student's examination and prepare an evaluation of that performance, which is reviewed by the Ph.D. committee.

G. Dissertation

Following successful completion of the qualifying examinations, the student

begins the process of preparing his or her dissertation.

The third year includes developing a directed reading course under the supervision of a dissertation director. Through the readings the student will explore specialized research literature in the area of a proposed dissertation, develop an initial bibliography, and formulate a specific question for research. The second half of the year includes working with the dissertation director and selecting a dissertation committee consisting of four faculty members—three from the Department of Political Science and one with whom the student has worked outside of the department. The third year culminates with a presentation of the dissertation proposal by the student and its acceptance by the dissertation committee.

Should the dissertation committee reject the proposal, a candidate is allowed to revise the proposal for a subsequent defense. If this second defense also results in failure, the student's program is terminated.

Upon successful conclusion of research, the student defends the completed dissertation to the committee and the University community at large.

Courses

M.A. in Political Science with Emphasis on Public Policy

Required courses (POL 501, POL 502, POL 509, POL 510, POL 535, POL 536) are open to qualified students from other programs with permission of the graduate program director. Elective courses are open to all graduate students.

Ph.D. Program

The required courses for first-year students are given every year; electives are generally offered every other year. Courses are open to qualified students from other programs with permission of the graduate program director.

POL 501 Introduction to Statistics for Public Policy

This course acquaints student with statistics. It begins with the basics of applied statistical analysis, including probability and hypothesis testing, and builds to simple regression analysis. Requires use of computer packages. *Prerequisites: Enrollment in the M.A. in Public Policy degree program*
Fall, 3 credits, ABCF grading

POL 502 Intermediate Statistics for Public Policy

This course utilizes multivariate regression

analysis and explores violations of the linear model. Requires use of computer.

Prerequisites: enrollment in the M.A. in Public Policy degree program
Spring, 3 credits, ABCF grading

POL 509 Public Budgeting and Finance

This course develops the rationale for public taxation and spending programs. It examines the role of public finance in the economy, and explores the use of program and functional budgets, capital and operating budgets, intergovernmental expenditures, etc. Focuses on state and local governments.

Prerequisites: Enrollment in the M.A. in Public Policy degree program
Fall, 3 credits, ABCF grading

POL 510 Personnel Systems for Public Policy

This course examines the development of civil service and other bureaucratic personnel systems in American government. It focuses on the knowledge that managers must have to utilize human resources appropriately in the constrained public sector environment. Focuses mainly on state and local government.

Prerequisite: Enrollment in the M.A. in Public Policy degree program
Spring, 3 credits, ABCF grading

POL 530 Topics in Public Affairs

Specially organized seminars are offered on topics of particular importance to students of public affairs. These courses are led by distinguished experts in those policy areas.

3 credits, ABCF grading
May be repeated for credit

POL 531 Topics in Public Affairs: Planning

This course addresses the planning process as a decision-making tool in the implementation of public policy in housing, land-use, transportation, and environmental management. The course also investigates intergovernmental relations and the impact of citizen participation on policy changes.

3 credits, ABCF grading
May be repeated for credit

POL 534 Intergovernmental Relations and Policy Delivery

The examination of the formulation, implementation, and impact of intergovernmental policy are the core concepts to be covered in this course. Several policies are examined in depth, including grant-in-aid programs, General Revenue Sharing, housing and community development, and employment programs. The historical, economic, and political foundations of intergovernmental policy delivery systems are examined.

Prerequisite: Enrollment in the M.A. in Public Policy degree program
3 credits, ABCF grading

POL 535 Public Policy Analysis and Evaluation

This course concentrates on the strategies and methods of public policy analysis and evaluation. Students debate the merits of proposed solutions to various policy issues and discover the political constraints on the policy making process. Skills stressed in the course include cost-benefit analysis, program evaluation, and basic microeconomics.

Prerequisites: Permission of graduate studies director; enrollment in the M.A. in Public Policy degree program
3 credits, ABCF grading

POL 536 Public Management and Organizational Behavior

This course examines how public sector organizations work and how managers can operate in the public sector environment. A range of theoretical perspectives, including sociological, economic, and institutional, will be employed as real public organizations are examined and analyzed. Public agencies will also be compared to their private sector counterparts, and the nature of organizational efficiency will be explored.

Prerequisite: enrollment in the M.A. in Public Policy degree program
Spring, 3 credits, ABCF grading

POL 537 Administrative Law for Policy Analysts

This course examines the role of administrative law in the formulation, implementation and evaluation of public policy. The role of legislation such as the Administrative Procedures Act is explored. Actual cases are analyzed, as well as the broader set of precedents that have emerged in federal, state, and local administrative law proceedings.

Prerequisite: Enrollment in the M.A. in Public Policy degree program
3 credits, ABCF grading

POL 538 The Politics of Local Economic Development

This course examines the process of local economic development with an emphasis on the interaction of political and economic factors. It explores the extent to which local (as compared to state and federal) officials can influence business location decisions, the specific strategies often utilized, and the way they have changed over time. It also considers the winners and losers from the "economic development game" with a focus on New York and Long Island.

3 credits, ABCF grading

POL 543 Environmental Politics and Policy

Federal environmental policies, such as the National Environmental Policy Act, the Coastal Zone Management Act, and the Federal Pure Waters Management Act are examined in this course. The policies, politics and administrative activities of federal, state, and local levels are considered. Finally, the interaction of the public sector, the private sector, and citizen groups in the implementation of environmental policy is discussed. This course is offered as both CES 553 and POL 543.

3 credits, ABCF grading

POL 544 Human Behavior as Rational Action

Rational behavior means choosing among possible actions those that are most efficient in meeting one's goals. Whether people do so is one of the oldest unresolved disputes in philosophy and the social sciences. We will trace the main positions in this dispute as they have evolved in philosophy, psychology, economics, anthropology and sociology, paying special attention to the argument between economics

and other social sciences as to whether economic behavior exhibits strictly economic rationality or is heavily affected by noneconomic obligations and aims. Another important topic is the relation between individual nationality and social institutions. Even if individuals do act rationally, can we assume that the large scale social patterns that result are necessarily effective? Readings will consider the topic abstractly, but also in the concrete settings of small intimate groups, formal organizations, and primitive and modern economic systems and political systems in both stable and revolutionary situations. Knowledge of elementary economics is helpful but not required.
3 credits, ABCF grading

POL 553 Foundations: Comparative, International

Survey and evaluation of the major theoretical approaches, issues, and problems in comparative political analysis. The course examines such areas as political development, empirical democratic theory, or political socialization, along with a detailed examination of one or more selected non-American political systems.
3 credits, ABCF grading

POL 560 American Democracy: Its Critics and Defenders

This course will examine the central components of American democratic government. Critics and defenders of the over 200 year-old Constitution (Congress, President, Supreme Court) will be discussed, as will arguments surrounding the role of political parties, pressure groups, and the bureaucracy. Most readings will be from contemporary authors and reference sources. This course is offered as both CEI 560 and POL 560.
3 credits, ABCF grading

POL 595 Internship Public Policy

May be repeated for credit

POL 596 Directed Policy Research

Student works under supervision of faculty member on research project related to public policy.
1-6 credits, ABCF grading

POL 597 Master's Paper in Public Policy

This course is primarily for students already employed in related field. In lieu of internship, student writes a Master's Paper, which goes beyond their normal employment duties to apply theory and methods to a particular policy issue.

Prerequisite: Permission of graduate program director
6 credits, ABCF grading

POL 598 Thesis Registration

May be repeated for credit

POL 599 Internship in Public Policy

This course is an applied internship in a public, not-for-profit, or private sector organization that deals with public policy. The student works in the organization and prepares a daily journal of activities, as well as a paper at the conclusion of the course, applying program knowledge to the internship activities.
Prerequisites: POL 535 and permission of

graduate program director
6 credits, S/U grading
May be repeated for credit

POL 600 Research Project

A two-semester introduction to research for first-year students. The course introduces issues of research design through lectures and presentations of current research by faculty members. Each student designs his or her own research paper under the guidance of a faculty member familiar with his or her area of interest. Final papers are due in the beginning of May.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading
May be repeated for credit

POL 601 Foundations: Public Policy and Political Economy

A systematic introduction to the principles of political economy. Develops a microeconomic model and approach to public policy analysis. A major part of the course is devoted to student projects that analyze the political economy of a governmental policy.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 602 Applied Data Analysis I

The application of statistical and mathematical models to the analysis of political data: introduction to the research process and to topics in measurement, basic descriptive statistics, and inferential statistics.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 603 Applied Data Analysis II

The application of statistical and mathematical models to the analysis of political data: regression analysis.

Prerequisite: POL 602 or equivalent; admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 604 Applied Data Analysis III

The application of statistical methods to the analysis of political data. The emphasis is on diagnosing and dealing with violations of assumptions of statistical models. Topics covered include advanced regression, models for discrete dependent variables, systems of equations, and selection bias.

Prerequisite: POL 603 or equivalent; admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 605 Foundations: American Politics

A review of the basic political science literature on American politics, with emphasis on American political institutions.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 606 Duration and Panel Models

This seminar will consider statistical models for political processes observed over time. The major topics will include duration models and methods for pooled cross-sectional (panel) data.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 607 Social Survey in Contemporary Society

This course on political socialization focuses on continuity and change in political attitudes and behavior across the life span. Topics include the stability of political attitudes—contrasting the greater durability of political partisanship and basic values with the relative instability of issue positions; the social psychology of attitude change, which lends some insight into the conditions under which attitudes are most likely to change; the importance of political period or era as a determinant of political attitudes and behavior; and the existence and coherence of distinct political generations. Some attention is also given to the political changes that accompany old age, including changes in attitude and behavior linked to growing dependency on the Social Security and Medicare systems.

Prerequisites: POL 602 and POL 603; admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 608 Foundations: Political Psychology, Behavior

A review and analysis of the political behavior literature, including such topics as attitude formation and change, belief systems, political socialization, demographic and small group influences on political beliefs and conduct, political leadership, electoral behavior, elite vs. mass politics, decision making, personality and politics, political conformity, and protest.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 609 Advanced Research Design

A practical application of topics in the philosophy of science to research design. Students prepare their dissertation proposal as a part of this course.

Prerequisite: Permission of graduate program director
3 credits, ABCF grading

POL 610 Foundations II: Experimental Design and Methods

An overview of experimental research with an emphasis on experimental design, data analysis, and interpretation. Students develop the ability to critically evaluate experimental research. Students also participate in the development, implementation, and analysis of a laboratory experiment.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 612 Classics of American Politics

Reading and discussion of a selection of the most frequently cited works in the field of American politics, with emphasis on relatively contemporary authors.

3 credits, ABCF grading

POL 613 Introduction to Public Choice

Introduction to public choice theory with an emphasis on the collective consequences of rational individual actions. Main areas covered include equilibrium analysis; prisoner's dilemma; Mancur Olson's "Logic" of collective action; Kenneth Arrow's general possibility theorem; voting methods, heresthetics, and democratic theory; spatial models of voting in small groups and in mass elections. Empirical applications focus primarily on American presidential elections.

Prerequisites: POL 602 and permission of instructor; admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 614 American Judiciary

A seminar on judicial process and behavior. Emphasis is placed on the Supreme Court, but trial courts and other appellate courts are examined as well. Topics include constitutional interpretation and both legal and extra-legal models of decision making. Students should possess basic methodological skills.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 615 Legislative Process

A seminar on the legislative process, focusing on current research on the United States Congress.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 616 Political Parties and Groups

A seminar on parties, campaigns, and elections in the United States. Topics covered include party organization and leadership, nomination and general election campaigns, and the role of parties in government.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 617 Electoral Behavior

Models of voting choices; key attitudes such as party identification, issue orientations, and ideology; the impact of group affiliations, economic conditions; campaign strategies of candidates; congressional vs. presidential elections; historical change, e.g., party realignments.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 618 American Political Ideology

This course examines American political ideology as it is reflected in public opinion, political debate, and public policy. The goal is to understand the underlying bases of conflict and consensus in American politics and the ways in which they influence and constrain debate over public policy. The course traces the development of political conflict in the United States and examines the basis of contemporary political debate.

Prerequisites: POL 605 and permission of instructor; admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 620 Government Regulation of Business

An examination of the scope of government regulation of business in the United States today-regulation at both the federal and state levels and by both economic and social agencies. The course compares market vs. regulatory policies as well as possible explanations for why some regulatory agencies change over time. Finally, the course considers proposed reforms, such as clearer legislative standards, curbs on "revolving door" practices, greater citizen participation in agency proceedings, and deregulation.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 621 Theories of Policy Making

An introduction to theories of policy making, especially policy formulation, stressing reading and thinking about classics and acquiring skills necessary for theorizing, including mathematical modeling and formal theory. Laboratories focus on improving special skills (e.g., optimization) and theorizing about particular policy areas (e.g., pork barrel politics).

3 credits, ABCF grading

POL 622 Bureaucracy and the Policy Process

An examination of bureaucracy as part of the policy-making process. This course reviews theoretical explanations for the bureaucracy as a political institution and implications of its rapid growth since the New Deal. It also looks inside bureaucratic organizations, examining factors that influence the exercise of discretion and policy implementation.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 623 Urban Politics

This course concentrates on urban and suburban growth, the decentralization of metropolitan areas, land-use policy, and reforming metropolitan policy making. Specific policy areas such as education, finance, and police are considered. Political phenomena, including parties and ethnic groups, are also discussed. This course is offered as both CES 545 and POL 623.

3 credits, ABCF grading

POL 624 Decision Making in Organizations

A seminar on decision procedures in public and private organizations. The course begins with the rational choice model developed primarily in economics and policy analysis, then considers common problems of decision making arising from limited capabilities, conflicts among organization members, and uncertainties and ambiguity in the organization's environment. Readings are from several disciplines.

3 credits, ABCF grading

POL 631 Political Cognition

Surveys the contemporary psychological literature on human memory and cognition, with emphasis on applications to political information processing.

Prerequisite: POL 608; admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 632 Mass Communication and Political Persuasion

In-depth examination of the role of mass media in the political process and the psychological dynamics of media influence. Effects of the media on public opinion and voting. Implications of media influence on democratic theory.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 633 Social Influence and Group Processes in Political Decision Making

Review of contemporary theories of social influence processes and group decision making, with emphasis on applications to decision making in politics. Special focus on small-group methods and research applications.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 634 Behavioral Decision Theory

Emphasizes psychological theories of judgment and choice and prediction of the errors that individual decision makers are likely to make. These ideas are applied to a variety of political contexts.

Prerequisite: Admission to the Political Science Ph.D. program
3 credits, ABCF grading

POL 635 Advanced Topics: Political Socialization

An interdisciplinary course on political socialization that focuses on continuity and change in political attitudes and behavior across the life span. Readings cover research and theorizing on conditions under which political attitudes are most likely to change. Dual emphasis is placed on attitudes that prove to be exceedingly stable over time and others that seem to have undergone considerable change over the last few decades.

3 credits, ABCF grading

POL 664 Advanced Institutions**POL 670 Advanced Topics: Public Policy Analysis I**

An intensive examination of major substantive and methodological concerns involved in the investigation of the public policy process.

Prerequisite: Permission of graduate program director; admission to the Political Science Ph.D. program
3 credits, ABCF grading
May be repeated for credit

POL 671 Advanced Topics: Public Policy Analysis II

A continuation of POL 670.
3 credits, ABCF grading

POL 673 Advanced Topics: American Politics I

A seminar in American institutions and processes, focusing on current research in such areas as Congress, the Supreme Court, the presidency, political parties, or bureaucracy.

Prerequisite: POL 605; admission to the Political Science Ph.D. program
3 credits, ABCF grading
May be repeated for credit

Applied Mathematics and Statistics (AMS)

Chairperson: James Glimm, Mathematics Building P-137 (631) 632-8355

Graduate Program Director: Xiaolin Li, Mathematics Building 1-121 (631) 632-8354

Graduate Secretary: Christine Rota, Mathematics Building 1-122 (631) 632-8360

Advanced Graduate Certificate awarded: Advanced Graduate Certificate in Operations Research

Degrees awarded: M.S. in Applied Mathematics and Statistics; Ph.D. in Applied Mathematics and Statistics

The Department of Applied Mathematics and Statistics, within the College of Engineering and Applied Sciences, offers programs in computational applied mathematics, operations research, statistics, and biomathematical modeling leading to the M.S. and Ph.D. degrees. The department offers an integrated series of courses and seminars, supervised reading, and facilities for research. Emphasis is on the study of real-world problems, computational modeling, and the development of necessary analytical concepts and theoretical tools. A state-of-the-art computational laboratory is operated for student education and research. This laboratory includes an advanced parallel supercomputer that is one of the most powerful machines of its type on the East Coast. It also features a network of advanced Unix workstations and modern printing facilities. The laboratory's full-time staff is available to help students become familiar with the laboratory facilities.

The department has close ties with the Institute for Mathematical Modeling, enhancing the opportunities for interaction with distinguished visiting scientists who are leaders in their fields. Professor James Glimm, chairperson of the department, also serves as the director of the Institute for Mathematical Modeling. Faculty members from the Harriman School for Management and Policy and many science, biomedical, and engineering programs participate in teaching and interdisciplinary research activities. Students, who receive a broad training, find themselves excellently prepared for careers in government and industry in which mathematics is used as a computational or conceptual tool.

Faculty research programs that receive significant external funding provide students with an opportunity for active participation in a variety of projects in computational mathematics, statistics, operations research, and biomathematics. Faculty interests include applied graph theory, biostatistics and mathematical modeling of epidemics, computational biology, structure-based drug design,

computational fluid dynamics, combinatorial optimizations, computational statistics, data analysis, flow through porous media, fracture mechanics, game theory, inverse problems, mixed-boundary value problems, nonlinear conservation laws, reliability theory, renal flow, robust estimation, nonparametric statistics, stochastic modeling and sequential decision making, and control theory. Most doctoral students are supported through either a research or teaching assistantship. The Ph.D. program normally takes about four years for students with a strong analytical and computing background.

The Department of Applied Mathematics and Statistics offers several areas of specialization. They include computational applied mathematics, statistics, and operations research, all of which are offered full time and part time. The M.S. programs, when pursued on a full-time basis, may be completed in three or four semesters. Students who have taken graduate courses before enrolling at Stony Brook may request transfer of credit (limited to six credits). If such a request is approved, it may be possible to complete the M.S. degree in two semesters. It is strongly urged that all applicants develop some facility in computer programming.

A more detailed description of the graduate program is available from the departmental office. This includes specific distribution requirements, fields of specialization, and information on the preliminary and qualifying examinations. Interested students should request information and application forms as early as possible, especially if they plan to apply for financial aid.

Admission

For admission to graduate study, the minimum requirements are as follows:

A. A bachelor's degree in engineering, mathematics, physics, chemistry, or the social sciences with a strong mathematics background;

B. A minimum grade point average of at least 3.00 in all courses in pertinent or related fields;

C. Results of the Graduate Record Examination (GRE) General Test;

D. Three letters of reference and all transcripts of undergraduate study completed;

E. Acceptance by both the Department of Applied Mathematics and Statistics and the Graduate School;

F. Students admitted provisionally must satisfy designated course and grade point average requirements during the first year of graduate study before being admitted to full degree candidacy.

Advanced Graduate Certificate Program in Operations Research

This advanced certificate program of 18 credits, consisting of six three-credit courses, trains students in the fundamental mathematical tools for working in the operations research profession. Operations research is the field of applied mathematics related to efficient management of the activities of private companies, government agencies and nonprofit organizations. The following courses are required for certificate:

1. AMS 507 Introduction to Probability
2. AMS 540 Linear Programming
3. AMS 550 Stochastic Models
4. AMS 553 Simulation and Modeling
5. AMS 572 Statistical Methods for Social Scientists
6. Elective chosen by student in consultation with advisor

Combined B.S./M.S. Degree

Undergraduate applied mathematics majors with strong academic credentials (minimum of 3.00 in the applied mathematics major) may apply for admission

to the special Bachelor of Science-Master of Science program in Applied Mathematics and Statistics at the end of the junior year. When the student is accepted, permission will be granted to take six graduate credits that will be applied toward the master's degree. The requirements for the B.S. degree must be completed before admission to the graduate program. At least 24 additional credits including the requirements stated in the *Graduate Bulletin* must be earned to qualify the student for the master's degree. Further information about the combined program may be obtained from either the graduate program director or the undergraduate program director.

Part-Time Graduate Studies

In addition to the full-time graduate program leading to the M.S. and Ph.D. degrees with specializations in computational applied mathematics, operations research, and statistics, the department conducts a part-time program on campus. The part-time program is governed by regulations governing the resident full-time program with the exception that students in the part-time program have greater flexibility in choosing the time for the qualifying examination if they are contemplating pursuing the Ph.D.

The purpose of the part-time program is to provide an opportunity for men and women who are employed full time to pursue serious graduate study leading to advanced degrees in applied mathematics, statistics, and operations research. Applicants who hold a bachelor's degree in applied mathematics, mathematics, engineering, physical sciences, life sciences, or social sciences with a strong background in undergraduate mathematics, will be considered for admission to this program. Qualified students may continue beyond the master's degree for the Ph.D. degree.

Additional information may be obtained from the graduate program director at the Department of Applied Mathematics and Statistics, Stony Brook University, Stony Brook, NY 11794-3600.

Faculty

Distinguished Professors

Glimm, James, *Chairperson*. Ph.D., 1959, Columbia University: Nonlinear equations, conservation laws; computational fluid dynamics; mathematical physics.

Zemanian, Armen H., Eng.Sc.D., 1953, New York University: Network theory; food system modeling.

Distinguished Teaching Professors

Tanur, Judith⁴, Ph.D., 1972, Stony Brook University: Application of statistics in social sciences; survey methodology.

Tucker, Alan, Ph.D., 1969, Stanford University: Graph theory; combinatorial algorithms.

Professors

Arkin, Esther, Ph.D., 1986, Stanford University: Combinatorial optimization; network flows; computational geometry.

Beltrami, Edward J., *Emeritus*. Ph.D., 1962, Adelphi University: Optimization techniques; models for public systems analysis.

Chen, Yung Ming, *Emeritus*. Ph.D., 1963, New York University: Numerical analysis and methods; numerical methods for solving inverse problems; large-scale numerical simulations.

Deng, Yuefan, Ph.D., 1989, Columbia University: Molecular dynamics; parallel computing.

Dicker, Daniel, *Emeritus*. D.Eng.Sc., 1961, Columbia University: Boundary value problems of solids and fluids; aeroelastic analysis of suspension bridges.

Feinberg, Eugene, Ph.D., 1979, Vilnius State University, Lithuania: Probability theory and statistics; control theory and applications in communication systems; transportation; computer networks and manufacturing.

Finch, Stephen, Ph.D., 1974, Princeton University: Robust estimation and nonparametric statistics.

Li, Xiaolin, Ph.D., 1987, Columbia University: Computational fluid dynamics; numerical analysis.

Lindquist, Brent¹¹, Ph.D., 1981, Cornell University: Flow in porous media; computational fluid dynamics.

Mendell, Nancy, Ph.D., 1972, University of North Carolina at Chapel Hill: Biostatistics.

Mitchell, Joseph², Ph.D., 1986, Stanford University: Operations research; computational geometry; combinatorial optimization.

Reinitz, John, Ph.D., 1988, Yale University: Theory of fundamental biological processes; bioinformatics; optimization; developmental biology and gene regulation.

Srivastav, Ram P., Ph.D., 1958, Lucknow University, India; Ph.D., 1963, D.Sc., 1972, Glasgow University, Scotland: Fracture mechanics; integral equations; mixed boundary value problems.

Tewarson, Reginald P., *Emeritus*. Ph.D., 1961, Boston University: Numerical analysis and computational methods; sparse matrices; generalized inverses and large nonlinear systems; mathematical models of diffusion problems in biology and medicine.

Associate Professors

Ahn, Hongshik, Ph.D., 1992, University of Wisconsin, Madison: Biostatistics; tree-structured regression.

Fortmann, Charles, Ph.D., 1985, Stanford University: Computational biophysics; photonics.

Zhu, Wei, Ph.D., 1996, University of California, Los Angeles: Biostatistics; optimal experimental design; linear models; structural equation modeling.

Assistant Professors

Green, David, Ph.D., 2003, MIT: Computational biology; protein structure.

Rizzo, Robert, Ph.D., 2001, Yale University: Computational biology; structure-based drug design.

Yildirim, Emre, Alper, Ph.D., 2001, Cornell University: Optimization theory; algorithms.

Zhang, Yongmin, Ph.D., 1997, University of Chicago: Computational fluid dynamics; numerical analysis.

Research Professor

Frey, Robert, Ph.D., 1986, Stony Brook University: Quantitative finance.

Adjunct Faculty

Alonso, Carlos, *Associate Professor*. Ph.D., 1992, Federal University of Rio De Janeiro: Computational biology.

Badr, Hussein G.⁶, *Associate Professor*. Ph.D., 1980, Pennsylvania State University: Operating systems; computer system performance evaluation.

Bender, Michael⁸, *Associate Professor*. Ph.D., 1996, Harvard University: Combinatorial algorithms.

Dubey, Pradeep¹⁶, *Professor*. Ph.D., 1975, Cornell University: Game theory; mathematical economics.

Ferguson, David¹², *Professor*. Ph.D., 1980, University of California, Berkeley: Mathematics education; educational technology.

Grove, John⁸, *Professor*. Ph.D., 1984, Ohio State University: Conservation laws; front tracking.

Martyna, Glenn⁹, *Professor*. Ph.D., 1989, Columbia University: Molecular dynamics.

Peierls, Ronald⁷, *Professor*. Ph.D., 1959, Cornell University: Parallel computing; particle physics.

Pinezich, John¹⁵, *Professor*. Ph.D., 1998, Stony Brook University: Radar; ballistics; sonar; acoustics.

Sharp, David⁸, *Professor*. Ph.D., 1963, California Institute of Technology: Mathematical physics; computational fluid dynamics.

Silva, Claudio², *Assistant Professor*. Ph.D., 1996, Stony Brook University: Visualization; computer graphics; computational geometry.

Simmerling, Carlos¹³, *Associate Professor*. Ph.D., 1995, University of Illinois at Chicago: Protein structure.

Skiena, Steven⁶, *Professor*. Ph.D., 1988, University of Illinois: Combinatorial algorithms; computational geometry; data structures.

Skorin-Kapov, Jadranka³, *Professor*. Ph.D., 1988, University of British Columbia, Canada: Mathematical programming; production management.

Sokal, Robert R.¹, *Emeritus Distinguished Professor*. Ph.D., 1952, University of Chicago: Numerical taxonomy; theory of systematics; geographic variation; spatial models in ecology and evolution.

Spirov, Alexander, *Associate Professor*. Ph.D., 1987, Irkutsk State University: Computational biology.

Weinig, Sheldon, *Professor*. Ph.D., 1955, Columbia University: Manufacturing management; material sciences.

Zemnian, Armen H.¹⁴, *Distinguished Professor*. Eng.Sc.D., 1953, New York University: Network theory; food system modeling.

Number of teaching, graduate, and research assistants, fall 2005: 66

1) Department of Ecology and Evolution

2) Department of Sociology

3) W. Averell Harriman School for Management and Policy

8) Los Alamos National Laboratory

9) IBM Watson Laboratory

10) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1996

11) Recipient of the State University Chancellor's Award for Excellence in Teaching, 2002

12) Department of Technology and Society

13) Department of Chemistry

14) Department of Electrical and Computer Engineering

15) Advanced Acoustical Concepts

16) Department of Economics

Degree Requirements

Requirements for the M.S. Degree

In addition to the minimum Graduate School requirements, the following are required:

A. Course Requirements

The M.S. degree in the Department of Applied Mathematics and Statistics requires the satisfactory completion of a minimum of 30 graduate credits in letter-graded (A, B, C, F) graduate courses.

All credits in satisfaction of the degree must be at the graduate level. The department may impose additional requirements as described below. In addition, the average for all courses taken must be B or higher, and at least 18 credits of all courses taken must carry a grade of B or higher.

The student pursues a program of study planned in consultation with an academic advisor. The program and any subsequent modifications require approval by the graduate program director.

Core Requirements for the M.S. Degree

1. Applied Mathematics
AMS 501 Differential Equations and Boundary Value Problems
AMS 503 Applications of Complex Analysis
AMS 504 Foundations of Applied Mathematics
AMS 505 Applied Linear Algebra
AMS 526 Numerical Analysis I
AMS 527 Numerical Analysis II
AMS 595 Fundamentals of Computing

2. Operations Research
AMS 510 Analytical Methods for Applied Mathematics and Statistics
AMS 507 Introduction to Probability
AMS 540 Linear Programming
AMS 550 Stochastic Models
AMS 556 Dynamic Programming or AMS 553/CSE 529 Simulation and Modeling or
AMS 542/CSE 548 Analysis of Algorithms
One course in statistics
AMS 595 Fundamentals of Computing

3. Statistics
AMS 510 Analytical Methods for Applied Mathematics and Statistics, or
AMS 504 Foundations of Applied Mathematics and
AMS 505 Applied Linear Algebra
AMS 507 Introduction to Probability
AMS 570 Mathematical Statistics I
AMS 572 Exploratory Data Analysis
AMS 575 Internship in Statistical Consulting
AMS 578 Regression Theory
AMS 582 Design of Experiments
AMS 595 Fundamentals of Computing

Elective Requirements for the M.S. Degree

Any graduate-level AMS or other graduate-level courses in a related discipline approved by the graduate program director may be used to satisfy the credit requirement beyond the core course requirement.

B. Final Recommendation

Upon fulfillment of the above requirements, the faculty of the graduate program will recommend to the dean of the Graduate School that the M.S. degree be conferred or will stipulate further requirements that the student must fulfill.

C. Time Limit

All requirements for the Master of Science degree must be completed within three years of the student's first registration as a full-time graduate student.

Requirements for the Ph.D. Degree

A. Course Requirements

The course of study prescribed for the M.S. degree provides basic guidelines for doctoral study. The student pursues a program of study planned in consultation with an academic advisor. The program and any subsequent modifications require approval of the graduate program director.

B. Qualifying Examination

A student must pass a qualifying examination to be allowed to continue toward the Ph.D. degree. The qualifying examination is given twice a year at the beginning and end of the spring semester and is designed to test the student's preparation to do research in applied mathematics. Each student must demonstrate competency in algebra and analysis and in-depth knowledge in one of the following areas:

Computational Applied Mathematics
Operations Research
Statistics

C. Research Advisor

After completion of at least one year of full-time residence and prior to taking the preliminary examination, the student must select a research advisor who agrees to serve in that capacity.

D. Preliminary Examination

This is an oral examination administered by a committee and given to the student when he or she has developed a research plan for the dissertation. The plan should be acceptable to the student's research advisor.

E. Mathematical Writing Requirement

The mathematical writing requirement is associated with the preliminary oral examination. The student must submit a document, typically 20 to 25 double-spaced pages long, containing the literature search synopsis for the proposed dissertation as well as research work accomplished to date. It must be given to the members of the Preliminary Examination committee at

least one week before the oral presentation. The document must have the written approval for good English and writing style as well as correct content by the student's thesis advisor and a faculty member, not of the Preliminary Examination Committee, who is appointed by the graduate program director. International students may need extensive writing assistance from the ESL Tutoring Center established to provide exactly this kind of technical writing tutorial support. Tutorial assistance in writing, if needed, will also be provided to native students.

F. Advancement to Candidacy

After successfully completing all requirements for the degree other than the dissertation, the student is eligible to be recommended for advancement to candidacy. This status is conferred by the dean of the Graduate School upon recommendation from the graduate program director.

G. Dissertation

The most important requirement of the Ph.D. degree is the completion of a dissertation, which must be an original scholarly investigation. The dissertation must represent a significant contribution to the scientific literature and its quality must be comparable with the publication standards of appropriate and reputable scholarly journals.

H. Dissertation Defense

The student must defend the dissertation before an examining committee. On the basis of the recommendation of this committee, the Department of Applied Mathematics and Statistics will recommend acceptance or rejection of the dissertation to the dean of the Graduate School. All requirements for the degree will have been satisfied upon successful defense of the dissertation.

I. Minimum Residence

At least two consecutive semesters of full-time study are required.

J. Time Limit

All requirements for the Ph.D. degree must be completed within seven years after the completion of 24 graduate credits in the program. The time limits for the qualifying and preliminary examinations and advancement to candidacy are described in the departmental *Graduate Student Handbook*.

K. Teaching Requirement

One academic year of teaching experience is required.

Courses

AMS 501 Differential Equations and Boundary Value Problems I

Examples of initial and boundary value problems in which differential equations arise. Existence and uniqueness of solutions, systems of linear differential equations, and the fundamental solution matrix. Power series solutions, Sturm-Liouville theory, eigenfunction expansion, Green's functions. *Spring, 3 credits, ABCF grading*

AMS 502 Differential Equations and Boundary Value Problems II

Analytic solution techniques for, and properties of solutions of, partial differential equations, with concentration on second order PDEs. Techniques covered include: method of characteristics, separation of variables, eigenfunction expansions, spherical means, Green's functions and fundamental solutions, and Fourier transforms. Solution properties include: energy conservation, dispersion, dissipation, existence and uniqueness, maximum and mean value principles.

*Prerequisite: AMS 501
3 credits, ABCF grading*

AMS 503 Applications of Complex Analysis

A study of those concepts and techniques in complex function theory that are of interest for their applications. Pertinent material is selected from the following topics: harmonic functions, calculus of residues, conformal mapping, and the argument principle. Application is made to problems in heat conduction, potential theory, fluid dynamics, and feedback systems.

Spring, 3 credits, ABCF grading

AMS 504 Foundations of Applied Mathematics

An introductory course for the purpose of developing certain concepts and techniques that are fundamental in modern approaches to the solution of applied problems. An appropriate selection of topics is based on the concepts of metric spaces, compactness, sequences and convergence, continuity, differentiation and integration, function sequences, contraction mapping theorem. Strong emphasis on proofs.

Fall, 3 credits, ABCF grading

AMS 505 Applied Linear Algebra

Review of matrix operations. Elementary matrices and reduction of general matrices by elementary operations, canonical forms, and inverses. Applications to physical problems. Coscheduled as AMS 505 or HPH 695.

Fall, 3 credits, ABCF grading

AMS 506 Finite Structures

Problem solving in combinatorial analysis and graph theory using generating functions, recurrence relations, Polya's enumeration formula, graph coloring, and network flows.

3 credits, ABCF grading

AMS 507 Introduction to Probability

The topics include sample spaces, axioms of probability, conditional probability and independence, discrete and continuous random variables, jointly distributed random variables, characteristics of random variables, law of large numbers and central limit theorem, Markov chains. Note: Crosslisted with HPH 696

3 credits, ABCF grading

AMS 510 Analytical Methods for Applied Mathematics and Statistics

Review of techniques of multivariate calculus, convergence and limits, matrix analysis, vector space basics, and Lagrange multipliers.

Fall, 3 credits, ABCF grading

AMS 511 Foundations of Quantitative Finance

Introduction to capital markets, securities pricing, and modern portfolio theory, including the organization and operation of securities market, the Efficient Market Hypothesis and its implications, the Capital Asset Pricing Model, the Arbitrage Pricing Theory, and more general factor models. Common stocks and their valuation, statistical analysis, and portfolio selection in a single-period, mean-variance context will be explored along with its solution as a quadratic program. Fixed income securities and their valuation, statistical analysis, and portfolio selection. Discussion of the development and use of financial derivatives. Introduction to risk neutral pricing, stochastic calculus, and the Black-Scholes Formula. Whenever practical, examples will use real market data. Numerical exercises and projects in a high-level programming environment will also be assigned.

*Prerequisite: AMS 505 or AMS 510; AMS 507
3 credits, ABCF grading*

AMS 512 Capital Markets and Portfolio Theory

Development of capital markets and portfolio theory in both continuous time and multi-period settings. Utility theory and its application to the determination of optimal consumption and investment policies. Asymptotic growth under conditions of uncertainty. Applications to problems in strategic asset allocation over finite horizons and to problems in public finance. Whenever practical, examples will use real market data. Numerical exercises and projects in a high-level programming environment will also be assigned.

*Prerequisite: AMS 511
3 credits, ABCF grading*

AMS 513 Financial Derivatives and Stochastic Calculus

Further development of derivative pricing theory including the use of equivalent martingale measures, the Girsanov Theorem, the Radon-Nikodym Derivative, and a deeper, more general understanding of the Arbitrage Theorem. Numerical approaches to solving stochastic PDE's will be further developed. Applications involving interest rate sensitive securities and more complex options will be introduced. Whenever practical, examples will use real market data. Numerical

exercises and projects in a high-level programming environment will also be assigned.

Prerequisite: AMS 511

3 credits, ABCF grading

AMS 514 Computational Finance

Review of foundations: stochastic calculus, martingales, pricing, and arbitrage. Basic principles of Monte Carlo and the efficiency and effectiveness of simulation estimators. Generation of pseudo- and quasi-random numbers with sampling methods and distributions. Variance reduction techniques such as control variates, antithetic variates, stratified and Latin hypercube sampling, and importance sampling. Discretization methods including first and second order methods, trees, jumps, and barrier crossings. Applications in pricing American options, interest rate sensitive derivatives, mortgage-backed securities and risk management. Whenever practical, examples will use real market data. Extensive numerical exercises and projects in a general programming environment will also be assigned.

Prerequisite: AMS 512 and AMS 513

3 credits, ABCF grading

AMS 515 Case Studies in Computational Finance

Actual applications of Quantitative Finance to problems of risk assessment, product design, portfolio management, and securities pricing will be covered. Particular attention will be paid to data collection and analysis, the design and implementation of software, and, most importantly, to differences that occur between "theory and practice" in model application, and to the development of practical strategies for handling cases in which "model failure" makes the naive use of quantitative techniques dangerous. Extensive use of guest lecturers drawn from the industry will be made.

Prerequisite: AMS 512 and AMS 513

3 credits, ABCF grading

AMS 520 Mathematical Modeling in the Analysis of Public Systems

Review of models relating to the questions of the improvement in delivery of urban service systems (e.g., fire, police, health, sanitation, transit). Topics include optimal location and districting of public facilities, distribution networks, models of congestion and delay in municipal services, and optimal deployment of emergency vehicles.

3 credits, ABCF grading

AMS 526 Numerical Analysis I

Direct and indirect methods for solving simultaneous linear equations and matrix inversion, conditioning, and round-off errors. Computation of eigenvalues and eigenvectors.

Co-requisite: AMS 505

Fall, 3 credits, ABCF grading

AMS 527 Numerical Analysis II

Numerical methods based upon functional approximation: polynomial interpolation and approximation; and numerical differentiation and integration. Solution methods for ordinary differential equations. AMS 527 may be taken whether or not the student has completed AMS 526.

Spring, 3 credits, ABCF grading

AMS 528 Numerical Analysis III

An introduction to scientific computation, this course considers the basic numerical techniques designed to solve problems of physical and engineering interest. Finite difference methods are covered for the three major classes of partial differential equations: parabolic, elliptic, and hyperbolic. Practical implementation will be discussed. The student is also introduced to the important packages of scientific software algorithms. AMS 528 may be taken whether or not the student has completed AMS 526 or AMS 527.

Spring, 3 credits, ABCF grading

AMS 530 Principles in Parallel Computing

This course is designed for both academic and industrial scientists interested in parallel computing and its applications to large-scale scientific and engineering problems. It focuses on the three main issues in parallel computing: analysis of parallel hardware and software systems, design and implementation of parallel algorithms, and applications of parallel computing to selected problems in physical science and engineering. The course emphasizes hands-on practice and understanding of algorithmic concepts of parallel computing.

Prerequisite: A course in basic computer science such as operating systems or architectures or some programming experience

Spring, 3 credits, ABCF grading

AMS 535 Introduction to Computational Structural Biology and Drug Design

This course will provide an introduction to Computational Structural Biology with application to Drug Design. Methods and applications that use computation to model biological systems involved in human disease will be emphasized. The course aims to foster collaborative learning and will consist of presentations by the instructor, guest lecturers, and by course participants with the goal of summarizing key methods, topics, and papers relevant to Computational Structural Biology.

0-3 credits, ABCF grading

May be repeated for credit

AMS 536 Molecular Modeling of Biological Molecules

This course is designed for students who wish to gain hands-on experience modeling biological molecules at the atomic level. In conjunction with the individual interests, Molecular Mechanics, Molecular Dynamics, Monte Carlo, Docking (virtual screening), or Quantum Mechanics software packages can be used to study relevant biological systems(s). Projects will include setup, execution, and analysis. Course participants will give literature presentations relevant to the simulations being performed and a final project report will be required. Familiarity with UNIX (Linux) is desirable.

Prerequisite: AMS 535 or permission of instructor

0-3 credits, ABCF grading

May be repeated for credit

AMS 540 Linear Programming

Formulation of linear programming problems and solutions by simplex method. Duality, sensitivity analysis, dual simplex algorithm, decomposition. Applications to the transportation problem, two-person games,

assignment problem, and introduction to integer and nonlinear programming. This course is offered as both MBA 540 and AMS 540.

Prerequisite: A course in linear algebra

3 credits, ABCF grading

AMS 542 Analysis of Algorithms

Techniques for designing efficient algorithms, including choice of data structures, recursion, branch and bound, divide and conquer, and dynamic programming. Complexity analysis of searching, sorting, matrix multiplication, and graph algorithms. Standard NP-complete problems and polynomial transformation techniques. This course is offered as both AMS 542 and CSE 548.

Spring, 3 credits, ABCF grading

AMS 544 Discrete and Nonlinear Optimization

Theoretical and computational properties of discrete and nonlinear optimization problems: integer programming, including cutting plane and branch and bound algorithms, necessary and sufficient conditions for optimality of nonlinear programs, and performance of selected nonlinear programming algorithms. This course is offered as both MBA 544 and AMS 544.

Prerequisite: AMS 540 or MBA 540

Spring, 3 credits, ABCF grading

AMS 545 Computational Geometry

Study of the fundamental algorithmic problems associated with geometric computations, including convex hulls, Voronoi diagrams, triangulation, intersection, range queries, visibility, arrangements, and motion planning for robotics. Algorithmic methods include plane sweep, incremental insertion, randomization, divide-and-conquer, etc. This course is offered as both AMS 545 and CSE 555.

Spring, 3 credits, ABCF grading

AMS 546 Network Flows

Theory of flows in capacity-constrained networks. Topics include maximum flow, feasibility criteria, scheduling problems, matching and covering problems, minimum-length paths, minimum-cost flows, and associated combinatorial problems. This course is offered as both MBA 546 and AMS 546.

Spring, 3 credits, ABCF grading

AMS 547 Discrete Mathematics

This course introduces such mathematical tools as summations, number theory, binomial coefficients, generating functions, recurrence relations, discrete probability, asymptotics, combinatorics, and graph theory for use in algorithmic and combinatorial analysis. This course is offered as both CSE 547 and AMS 547.

Spring, 3 credits, ABCF grading

AMS 550 Operations Research: Stochastic Models

Includes Poisson processes, renewal theory, discrete-time and continuous-time Markov processes, Brownian motion, applications to queues, statistics, and other problems of engineering and social sciences. This course is offered as both MBA 550 and AMS 550.

Prerequisite: AMS 507 or equivalent

3 credits, ABCF grading

AMS 552 Game Theory I

Elements of cooperative and noncooperative games. Matrix games, pure and mixed strategies, and equilibria. Solution concepts such as core, stable sets, and bargaining sets. Voting games, and the Shapley and Banzhaf power indices. This course is offered as both ECO 604 and AMS 552.

Prerequisite for ECO 604: Graduate standing in the Economics Department or permission of Graduate Director

Prerequisite: Admission to graduate AMS program, or permission of instructor
0-3 credits, ABCF grading

AMS 553 Simulation and Modeling

A comprehensive course in formulation, implementation, and application of simulation models. Topics include data structures, simulation languages, statistical analysis, pseudo-random number generation, and design of simulation experiments. Students apply simulation modeling methods to problems of their own design. This course is offered as CSE 529, AMS 553, and MBA 553.

Prerequisite: CSE 214 or equivalent; AMS 310 or 507 or equivalent; or permission of instructor

3 credits, ABCF grading

AMS 554 Queuing Theory

Introduction to the mathematical aspects of congestion. Birth and death processes. Queues with service priorities and bulk-service queues. Analysis of transient- and steady-state behavior. Estimation of parameters. Applications to engineering, economic, and other systems. This course is offered as both MBA 554 and AMS 554.

Fall, even years, 3 credits, ABCF grading

AMS 555 Game Theory II

Refinements of strategic equilibrium, games with incomplete information, repeated games with and without complete information, and stochastic games. The Shapley value of games with many players, and NTU-values. This course is offered as both ECO 605 and AMS 555.

Spring, 0-3 credits, ABCF grading

AMS 556 Dynamic Programming

Stochastic and deterministic multistage optimization problems. Stochastic path problems. Principle of optimality. Recursive and functional equations. Method of successive approximations and policy iteration. Applications to finance, economics, inventory control, maintenance, inspection, and replacement problems. This course is offered as both MBA 556 and AMS 556.

Prerequisite: MBA/AMS 550 or MBA/AMS 558
3 credits, ABCF grading

AMS 562 Numerical Hydrology

Numerical solution methods for the equations of incompressible flow in porous media with special emphasis on groundwater flow. Finite difference and finite element methods for steady-state and transient flows-boundary conditions, range of validity and stability of the numerical schemes, and numerical artifacts. The approach is hands on, with example problems being computed. This course is offered as both GEO 564 and AMS 562.

Fall, alternate years, 3 credits, ABCF grading

AMS 565 Wave Propagation

Theory of propagation of vector and scalar waves in bounded and unbounded regions. Development of methods of geometrical optics. Propagation in homogeneous and anisotropic media.

3 credits, ABCF grading

AMS 566 Compressible Fluid Dynamics

Physical, mathematical, and computational description in compressible fluid flows. Integral and differential forms of the conservation equations, one-dimensional flow, shocks and expansion waves in two and three dimensions, quasi-one-dimensional flow, transient flow, numerical methods for steady supersonic flow, numerical methods for transient flow.

Spring, 3 credits, ABCF grading

AMS 569 Probability Theory I

Probability spaces and sigma-algebras. Random variables as measurable mappings. Borel-Cantelli lemmas. Expectation using simple functions. Monotone and dominated convergence theorems. Inequalities. Stochastic convergence. Characteristic functions. Laws of large numbers and the central limit theorem. This course is offered as both AMS 569 and MBA 569.

Prerequisite: AMS 504 or equivalent
3 credits, ABCF grading

AMS 570 Introduction to Mathematical Statistics

Probability and distributions; multivariate distributions; distributions of functions of random variables; sampling distributions; limiting distributions; point estimation; confidence intervals; sufficient statistics; Bayesian estimation; maximum likelihood estimation; statistical tests.

Prerequisite: AMS 312 or equivalent
3 credits, ABCF grading

AMS 571 Mathematical Statistics

Sampling distribution; convergence concepts; classes of statistical models; sufficient statistics; likelihood principle; point estimation; Bayes estimators; consistency; Neyman-Pearson Lemma; UMP tests; UMPU tests; Likelihood ratio tests; large sample theory.

Prerequisite: AMS 312; AMS 570 is preferred but not required
3 credits, ABCF grading

AMS 572 Data Analysis I

Introduction to basic statistical procedures. Survey of elementary statistical procedures such as the t-test and chi-square test. Procedures to verify that assumptions are satisfied. Extensions of simple procedures to more complex situations and introduction to one-way analysis of variance. Basic exploratory data analysis procedures (stem and leaf plots, straightening regression lines, and techniques to establish equal variance). Coscheduled as AMS 572 or HPH 698.

Fall, 3 credits, ABCF grading

AMS 573 Design and Analysis of Categorical Data

Measuring the strength of association between pairs of categorical variables. Methods for evaluating classification procedures and

inter-rater agreement. Analysis of the associations among three or more categorical variables using log linear models. Logistic regression.

Spring, 3 credits, ABCF grading

AMS 575 Internship in Statistical Consulting

Directed quantitative research problem in conjunction with currently existing research programs outside the department. Students specializing in a particular area work on a problem from that area; others work on problems related to their interests, if possible. Efficient and effective use of computers. Each student gives at least one informal lecture to his or her colleagues on a research problem and its statistical aspects.

Prerequisite: Permission of instructor
3-4 credits, ABCF grading

AMS 576 Statistical Methods for Social Scientists

This course is an introduction to statistical thinking in the social sciences. The course covers statistical variability, standard scores, regression correlation, sampling notions, estimation, confidence intervals, significance testing, conditional probability, and Bayesian manipulations. This course is offered as both CET 555 and AMS 576.

Prerequisite: AMS 310 or permission of instructor
3 credits, ABCF grading

AMS 577 Multivariate Analysis

The multivariate distribution. Estimation of the mean vector and covariance matrix of the multivariate normal. Discriminant analysis. Canonical correlation. Principal components. Factor analysis. Cluster analysis.

Prerequisites: AMS 572 and AMS 578
3 credits, ABCF grading

AMS 578 Regression Theory

Classical least-squares theory for regression including the Gauss-Markov theorem and classical normal statistical theory. An introduction to stepwise regression, procedures, and exploratory data analysis techniques. Analysis of variance problems as a subject of regression. Brief discussions of robustness of estimation and robustness of design.

Prerequisite: AMS 572 or equivalent
3 credits, ABCF grading

AMS 581 Analysis of Variance

Analysis of models with fixed effects. The Gauss-Markov theorem; construction of confidence ellipsoids and tests with Gaussian observations. Problems of multiple tests of hypotheses. One-way, two-way, and higher-way layouts. Analysis of incomplete designs such as Latin squares and incomplete blocks. Analysis of covariance problems.

Prerequisite: AMS 570 or equivalent
3 credits, ABCF grading

AMS 582 Design of Experiments

Discussion of the accuracy of experiments, partitioning sums of squares, randomized designs, factorial experiments, Latin squares, confounding and fractional replication, response surface experiments, and incomplete block designs. Coscheduled as AMS 582 or HPH 699.

Prerequisite: AMS 572 or equivalent
3 credits, ABCF grading

AMS 586 Time Series

Analysis in the frequency domain. Periodograms, approximate tests, relation to regression theory. Pre-whitening and digital filters. Common data windows. Fast Fourier transforms. Complex demodulation, Gibbs' phenomenon issues. Time-domain analysis.

Prerequisites: AMS 507 and AMS 570
3 credits, ABCF grading

AMS 587 Nonparametric Statistics

This course covers the applied nonparametric statistical procedures: one-sample Wilcoxon tests, two-sample Wilcoxon tests, runs test, Kruskal-Wallis test, Kendall's tau, Spearman's rho, Hodges-Lehman estimation, Friedman analysis of variance on ranks. The course gives the theoretical underpinnings to these procedures, showing how existing techniques may be extended and new techniques developed. An excursion into the new problems of multivariate nonparametric inference is made.

Fall, 3 credits, ABCF grading

AMS 588 Biostatistics

Statistical techniques for planning and analyzing medical studies. Planning and conducting clinical trials and retrospective and prospective epidemiological studies. Analysis of survival times including singly censored and doubly censored data. Quantitative and quantitative bioassays, two-stage assays, routine bioassays. Quality control for medical studies.

Fall, 3 credits, ABCF grading

AMS 589 Quantitative Genetics

Definition of relevant terminology. Statistical and genetic models for inheritance of quantitative traits. Estimation of effects of selection, dominance polygenes, epistasis, and environment. Linkage studies and threshold characteristics.

Spring, odd years, 3 credits, ABCF grading

AMS 591 Topics for M.S. Students

Various topics of current interest in applied mathematics will be offered if sufficient interest is shown. Several topics may be taught concurrently in different sections.

Prerequisite: Permission of instructor
3 credits, ABCF grading
May be repeated for credit

AMS 592 Mathematical Methods of Finance and Investments I

A broad-based course in mathematical modeling and quantitative analysis of financial transactions and investment management issues such as debt and equity, measures of risk and returns, efficient markets and efficient set mathematics, asset pricing, one-factor and multiple-factor models, portfolio selection, futures and options.

Fall, 3 credits, ABCF grading

AMS 593 Mathematical Theory of Interest and Portfolio Pricing

Calculation of simple and compound interest poses elementary arithmetic or algebraic problems. Variable interest rates (including indexing), inflation, changes in the exchange rates of foreign currency, and changes in the laws, such

as income tax, create investment risks. The course is intended to develop problem-solving skills and adopts both deterministic and stochastic approaches. The perspectives of the consumer and the investor are taken into account. The material helps students prepare for the actuarial examinations. Topics are selected from the following: simple and compound interest, fixed-rate loans and mortgages, annuities and capital budgeting of pension plans, variable interest rates, bonds, prepayment and default scenarios, and currency baskets.

Fall, 3 credits, ABCF grading

AMS 594 Mathematical Methods of Finance and Investments II

This course employs the techniques of mathematical statistics and empirical finance, e.g., estimation theory, linear and nonlinear regression, time series analysis, modeling and simulation to examine critically various models of prediction for asset-pricing, pricing of derivative products and term-structure of interest rates assuming stochastic volatility. Statistics necessary for analysis is incorporated in the course.

Fall, 3 credits, ABCF grading

AMS 595 Fundamentals of Computing

Introduction to UNIX operating system, C language, graphics, and parallel supercomputing.

Fall, 1 credit, ABCF grading

AMS 596 Fundamentals of Large-Scale Computing

Overview of the design and maintenance of large scale computer projects in applied mathematics, including basic programming techniques for massively parallel supercomputers.

Spring, 1 credit, ABCF grading

AMS 597 Statistical Computing

Introduction to statistical computing using SAS and S plus.

Fall, 1 credit, ABCF grading

AMS 599 Research

May be repeated for credit

AMS 605 Probability Theory II

Advanced probability. Conditional sigma-fields, stochastic processes, Brownian motion, Markov property, weak convergence, infinitely divisible distributions, martingales, stochastic integrals, stochastic differential equations, and stochastic approximation.

Prerequisite: AMS 569 or permission of instructor

3 credits, ABCF grading

AMS 607 Advanced Stochastic Processes I

Theory and application of continuous time stochastic processes, continuous time martingales, square-integrable martingales, Brownian motion, stochastic integrals and Ito's formula, stochastic differential equations, and applications to financial mathematics.

Spring, 3 credits, ABCF grading

AMS 615 Advanced Stochastic Processes II

Existence, uniqueness, and continuity theorems. Approximate solutions by method of iteration. Study of autonomous systems. Phase-plane analysis, periodic solutions. Singular points, cycles, and limit cycles. Theory of bifurcation. Stability theory and

Liapunov functions. Analytical and geometrical investigations of second-order equations such as van der Pol's and Lienard's equations.

Prerequisite: AMS 501

3 credits, ABCF grading

AMS 620 Theory and Applications of Large-Scale Networks

A rigorous treatment of mathematical techniques used to answer many practical questions arising in the study and design of large-scale networks. Emphasis on the development of algorithms. Several lectures devoted to specific applications to computer networks to be used throughout the course.

Prerequisite: AMS 540 or equivalent

3 credits, ABCF grading

AMS 621 Finite Element Methods for Partial Differential Equations

Variational form of the problem, Ritz-Galerkin, collocation, and mixed methods; triangular, rectangular (2-D), and tetrahedral (3-D) elements; accuracy, convergence, and stability; solutions of linear, nonlinear steady-state, and dynamic problems; implicit and explicit time integration; equivalence of finite-element and finite-difference methods.

Prerequisite: AMS 502 or equivalent

3 credits, ABCF grading

AMS 623 Topics in Systems and Control Theory

This course is designed for second- and third-year graduate students who wish to pursue research in the area of systems and control theory. The students are expected to have a strong research background in linear algebra and differential equations and basic knowledge in systems and control theory.

Spring, 3 credits, ABCF grading

May be repeated for credit

AMS 627 Theory of Integral Equations and Their Applications

Integral equations with degenerate kernels, equations of the second kind, iterative solutions, contraction mapping principle, Fredholm theory, and spectral theory for symmetric kernels. Volterra equations of the first and second kind, equations with weakly singular kernels, simultaneous systems, and applications.

Prerequisites: AMS 504 and AMS 505

3 credits, ABCF grading

AMS 628 Applications of Functional Analysis

Introduction to such topics as unbounded operators and the closed-graph theorem, convexity, weak convergence in Hilbert space, and degree theory. Applications to monotone operators and the stability of nonlinear systems, to Schwartz distributions and passive linear systems, and to the solution of nonlinear equations.

Prerequisite: AMS 504 or equivalent

3 credits, ABCF grading

AMS 641 Special Topics in Mathematical Programming

The course is designed for second- and third-year graduate students with a strong foundation in linear algebra and analysis who wish to pursue research in applied mathematics. Varying topics from nonlinear programming

and optimization to applied graph theory and applied combinatorics may be offered concurrently.

Prerequisites: AMS 540 and permission of instructor

3 credits, ABCF grading

May be repeated for credit

AMS 644 Special Topics in Applied Probability

The course is designed for second- and third-year graduate students with a background in probability and stochastic modeling who wish to pursue research in applications of the probability theory. Several topics may be taught concurrently in different sections.

Prerequisites: AMS 540

3 credits, ABCF grading

May be repeated for credit

AMS 651 Nonlinear Analysis and Optimization

Iterative methods for solving nonlinear operator equations. Frechet differentials. The Newton-Raphson method in function space and nonlinear boundary value problems. The Courant penalty concept and constrained optimization. General multiplier rules. Variable metric gradient projection for nonlinear least-square methods, with applications.

3 credits, ABCF grading

AMS 652 Special Topics in Game Theory

The course is designed for second- and third-year graduate students who wish to specialize in the mathematical theory of games.

Prerequisites: AMS 552 and permission of instructor

3 credits, ABCF grading

May be repeated for credit

AMS 670 Special Topics in Probability and Mathematical Statistics

The course is designed for second- and third-year graduate students with a strong foundation in analysis and statistics who wish to pursue research in mathematical statistics. Several topics may be taught concurrently in different sections.

Prerequisites: AMS 569, AMS 570

3 credits, ABCF grading

May be repeated for credit

AMS 675 Special Topics in Applied Statistics

The course is designed for second- and third-year students with a strong foundation in statistical analysis who wish to pursue research in applied statistics.

Prerequisites: AMS 507, AMS 572

3 credits, ABCF grading

May be repeated for credit

AMS 676 Internship in Applied Mathematics

Directed research and/or practical experience in industry, financial and consulting firms, and research institutions. Students are required to have a department faculty adviser who coordinates and supervises the internship. Submission of the final report is required.

0-9 credits, S/U grading

AMS 683 Biological Physics and Biophysical Chemistry: Theoretical Perspectives

This course will survey a selected number of topics in biological physics and biophysical

chemistry. The emphasis is on the understanding of physical organization principles and fundamental mechanisms involved in the biological process. The potential topics include: Protein Folding, Protein Dynamics, Biomolecular Interactions and Recognition, Electron and Proton Transfer, Motors, Membranes, Single Molecules and Single Cells, Cellular Networks, Development and Differentiation, Brains and Neural Systems, Evolution. There will be no homework or exams. The grades will be based on the performance of the term projects. Crosslisted with PHY 680 and CHE 683.

0-3 credits, ABCF grading

AMS 690 Special Topics in Differential Equations and Applied Analysis

The course is designed for second- and third-year graduate students with a strong foundation in analysis who wish to pursue research in applied mathematics. Several topics may be taught concurrently in different sections.

Prerequisites: AMS 501, AMS 504

3 credits, ABCF grading

May be repeated for credit

AMS 691 Topics in Applied Mathematics

Varying topics selected from the list below if sufficient interest is shown. Several topics may be taught concurrently in different sections: Advanced Operational Methods in Applied Mathematics

Approximate Methods in Boundary Value

Problems in Applied Mathematics

Control Theory and Optimization

Foundations of Passive Systems Theory

Game Theory

Mixed Boundary Value Problems in

Elasticity

Partial Differential Equations

Quantitative Genetics

Stochastic Modeling

3 credits, ABCF grading

May be repeated for credit

AMS 695 Special Topics in Numerical Analysis and Scientific Computing

The course is designed for second- and third-year graduate students with a strong foundation in applied linear algebra and numerical analysis who wish to pursue research in applied mathematics. Several topics may be taught concurrently in different sections.

Prerequisites: AMS 505, AMS 526

3 credits, ABCF grading

May be repeated for credit

AMS 698 Practicum in Teaching

May be repeated for credit

AMS 699 Dissertation Research on Campus

Prerequisite: Must be advanced to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab

Fall, spring, and summer, 1-12 credits, S/U grading

May be repeated for credit

AMS 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take

place off-campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, summer, 1-9 credits, S/U grading

May be repeated for credit

AMS 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside of the U.S. and/or U.S.

provinces; domestic students have the option of the health plan and may also enroll in

MEDEX; international students who are

in their home country are not covered by

mandatory health plan and must contact

the Insurance Office for the insurance

charge to be removed; international students

who are not in their home country are

charged for the mandatory health insurance

(if they are to be covered by another

insurance plan, they must file a waiver

by the second week of classes; the charge

will only be removed if the other plan is

deemed comparable); all international

students must receive clearance from an

International Advisor

Fall, spring, summer, 1-9 credits, S/U grading

May be repeated for credit

AMS 800 Summer Research

May be repeated for credit

Art (ARH, ARS)

Chairperson: Mel Pekarsky, Staller Center 2221 (631) 632-7270

Graduate Program Director: Michele H. Bogart, Staller Center 4219 (631) 632-7270

MFA Program Director: Howardena Pindell, Staller Center 4211 (631) 632-7270

Graduate Secretary: Staller Center 2229 (631) 632-7270

Degrees awarded: M.A. in Art History and Criticism; M.F.A. in Studio Art; Ph.D. in Art History and Criticism

The Department of Art's master's and doctoral programs in art history and criticism and the master of fine arts program in studio art occupy unique positions among graduate programs in art studies. The department's programs have been built with a strong emphasis on modern art and contemporary visual culture, incorporating a diversity of critical, theoretical, and interdisciplinary interests. Rather than being isolated at a special or autonomous art institute or school, these programs have all the advantages associated with the intellectual environment of a major research university. Students have the opportunity to explore other fields in addition to art history and criticism or studio art, and may elect to complete one or more graduate certificate programs in Cultural Studies, Art and Philosophy, and Women's Studies, among others. Moreover, because of the Art Department's extensive undergraduate programs, Stony Brook is the only major university in the New York metropolitan area to offer teaching experience to first- and/or second-year graduate students in art history and criticism or studio art. Such experience is an important asset in today's job market.

Graduate studies are facilitated by Stony Brook's ideal location halfway between the art centers of New York City and the Hamptons, along the beautifully wooded North Shore of Long Island. Classes, lectures, and conferences are also offered at the newly opened Stony Brook Manhattan facility and at the Pollock-Krasner House and Study Center in East Hampton, administered under the auspices of the Art Department and the Stony Brook Foundation. All curricula are designed to take advantage of the full range of museums, galleries, and libraries of the metropolitan region as well as the facilities of a major research university campus. Thanks to the well-established ties of Stony Brook faculty to the professional art world, our students are regularly placed in internship and

apprenticeship programs with artists, galleries, museums, arts agencies, and other cultural institutions throughout the metropolitan area. Art history students also have the opportunity to gain valuable experience as managing and business editors for the respected semi-annual journal, *Art Criticism*, published by the department under the editorship of Donald Kuspit.

Degree Programs

M.A. in Art History and Criticism

The M.A. in Art History and Criticism is a two-year, 36-credit degree program that offers an integrated curriculum of art history, criticism, and theory with a particular focus on modern and contemporary art and visual culture. It presents the graduate student a unique opportunity for innovative study in art criticism and theory and traditional study in art history. The goals of the program include the development of the critic or historian who can combine the various fields of art historical study with a critical consciousness and awareness of larger intellectual issues involved in such study. For example, seminars are offered on the study of the history of art criticism; the development of alternative perspectives on art; the development of practicing art critics; and the interdisciplinary study of modern and contemporary art, among others. The program culminates in the preparation of a written thesis. Part-time study is allowed in this degree program. The M.A. in Art History and Criticism can be considered appropriate preparation for Ph.D. degrees in art history or other fields. Other students go on to careers in arts education or gallery and museum work.

The M.F.A. in Studio Art

The M.F.A. in Studio Art is a flexible 60-credit terminal degree combining studio work, academic studies, and intellectual theory. Although the degree requirements concentrate primarily on studio work, the program requires several liberal arts courses as well as a teaching practicum. The program culminates in a

one-person thesis show accompanied by a written thesis, as well as participation in a M.F.A. group exhibition in the University Art Gallery. Normally, the M.F.A. requires three years of full-time residency. Students are not accepted into the M.F.A. program on a part-time basis. The degree is especially suitable for students who plan professional involvement in the making of art as artists, and it may also be the degree of choice for those preparing for careers in arts administration, art education, or gallery and museum work.

Ph.D. in Art History and Criticism

Stony Brook's Ph.D. program in art history and criticism is designed to encourage students to apply what they have learned at the master's level toward more intense and individual research. It is organized to allow students to further their areas of study by concentrating on major and minor fields defined according to the individual interests of the student and reflecting the strengths of the faculty. The emphasis of the program is on integrating research and analysis into a single curriculum with a particular focus on art criticism and theory and an interdisciplinary approach to modern and contemporary art and visual culture. The program culminates in the oral defense of a substantial written dissertation on an original topic. Students are not accepted into the Ph.D. program on a part-time basis. This degree is considered essential for those intending to engage in advanced academic research, teaching, and publishing in the field of art history and criticism, and may provide a significant advantage to those entering the professional art world of museums and galleries.

Facilities

Since 1976, the Department of Art has enjoyed the resources of the Staller Center for the Arts. This 226,026 square foot building includes the departments of Art, Music, and Theatre and is a vibrant hub of lectures, concerts, performances, and other cultural activities.

The complex includes faculty and staff offices, art history classrooms, and a graduate lounge. The first floor of the Art wing features a magnificent art gallery space devoted primarily to exhibitions of contemporary art, including the annual M.F.A. show. In addition, the department has substantial graduate studio space available at other locations on the campus. Each M.F.A. student is provided individual studio space and there are large common spaces used regularly for discussion, temporary exhibitions or installations, and documentation of work. The Graduate Library Gallery provides exhibition space with media exhibition equipment and network connection for M.F.A. students, and there are several other on-campus locations where students have opportunities to exhibit their work. Studio facilities in the Staller Center include full foundry, metals, and wood shops; a ceramics and ceramic sculpture studio; spacious painting, drawing, and studio classrooms; printmaking studios with etching, stone lithography and photo plate making and screen printing facilities; extensive digital facilities; and a shooting studio with gang and individual darkrooms. The Visual Resources Library offers an extensive slide collection to support the teaching and research needs of the department, videos and print journals, as well as computer equipment for the ongoing development of a database and digital imaging capacity. Art history classrooms are equipped with slide projectors and digital projectors. The main library houses extensive collections of scholarship on the arts, including recent exhibition catalogues and the most important art history and criticism journals. In addition, art history and criticism students have the opportunity to gain business and editorial experience by assisting with the production of the respected journal *Art Criticism*, published semiannually by the department. Proximity to New York City makes available the numerous libraries, museums, galleries, ateliers, and publishing institutions of the greater metropolitan area. Classes, lectures, and conferences are also now offered at Stony Brook's Manhattan facility, conveniently located at 28th Street and Park Avenue South, and easy to reach by bus, train, and subway. Finally, the Pollock-Krasner House and Study Center in East Hampton, Long Island, is affiliated with the University. Once the home and studio of Jackson Pollock and Lee Krasner, it is

now both a landmark museum and a forum for lectures, seminars, and other academic activities. The Study Center comprises extensive reference materials and archives, including books, photographs, oral histories, and journals available for research.

Admission

Admission to the M.A. and Ph.D. Programs in Art History and Criticism

In addition to the requirements of the Graduate School, the following information and prerequisites should be noted:

Admission for full-time study may be for either the Fall or Spring semester, though the former is advisable, both for financial awards (at the Ph.D. level) and for organizing the course of study. Part-time study is permissible for qualified M.A. candidates only. Admission into the M.A. and Ph.D. programs is at the discretion of the departmental graduate studies committee with the final approval of the Graduate School. Admission to the program assumes a minimum of a B average in undergraduate work, meeting the standards of admission to the Graduate School, and taking the Graduate Record Examination (GRE) General Test, as required for all applicants to the Graduate School. The minimum TOEFL score for admission is 550 (paper) or 213 (computer) or an IELTS total score of 6.5. In order to teach, any graduate student whose native language is not English must score 55 or above on the TSE or SPEAK test or obtain a score of 7.0 or better in the speaking component of the IELTS test. The Web site for ETS (TOEFL and GRE) is www.ets.org.

It is recognized that M.A. and Ph.D. applicants may come from a wide variety of backgrounds that will require individual structuring of their programs to suit their needs. Applicants will ordinarily have a bachelor's degree with an art history major or minor; however, this requirement may be waived at the discretion of the departmental graduate studies committee. Those without a demonstrated background in art history may be advised to take undergraduate courses in the department prior to admission to the program. All applicants are encouraged to submit a sample of written work with their application.

Admission to the M.F.A. Program in Studio Art

In addition to the requirements of the Graduate School, the following informa-

tion and prerequisites should be noted:

Admission for full-time study will be granted to begin in the fall semester only. Admission into the M.F.A. program is at the discretion of the graduate faculty with final approval of the Graduate School. Admission to the program assumes a minimum of a B average in undergraduate work, meeting the standards of admission to the Graduate School, and taking the GRE (Graduate Record Examination) General Test, as required for all applicants to the Graduate School. The minimum TOEFL score for admission is 550 (paper) or 213 (computer) or an IELTS total score of 6.5. In order to teach, which is a requirement for the M.F.A., any graduate student whose native language is not English must score 55 or above on the TSE or SPEAK test or obtain a score of 7.0 or better in the speaking component of the IELTS test. The Web site for ETS (TOEFL and GRE) is www.ets.org.

All candidates for the M.F.A. program must enter with a minimum of 40 semester hours of credit or the equivalent of undergraduate work in studio art in a B.A., B.S., B.F.A., or similar program. The candidate must submit with his or her graduate application 15 to 20 slides of work or other appropriate materials that may include NTSC VHS video tapes, DVDs, or CDs. Applicants should also have a minimum of 15 semester hours of credit in art history, theory, or criticism. At the discretion of the graduate faculty, those without sufficient background may be advised to complete further undergraduate coursework prior to acceptance and admission to the program. Decisions by the graduate art faculty on these matters are in addition to, and not in lieu of, the general requirements of the Graduate School.

Faculty

The faculty of the Art Department consists of artists and scholars of national and international reputation who are actively involved in the practice of art, art criticism, or art historical research. Artists on the faculty works are represented in major galleries, museums, and exhibitions; the critics and historians are represented by numerous books and articles in major scholarly journals or presses.

Professors

Bogart, Michele H., Ph.D., 1979, University of Chicago: American art and visual culture.

Buonagurio, Toby, M.A., 1971, City College of New York: Ceramics; ceramic sculpture; drawing.

Guilmain, Jacques, *Emeritus*. Ph.D., 1958, Columbia University: Medieval art; archaeology.

Kuspit, Donald B., Ph.D., 1971, University of Michigan; D.Phil., 1960, University of Frankfurt, Germany: Art criticism; aesthetics; 20th-century and Northern Renaissance art.

Moskowitz, Anita, Ph.D., 1978, New York University: Medieval and Renaissance art and connoisseurship.

Pekarsky, Melvin H., *Chairperson*. M.A., 1956, Northwestern University: Drawing; painting; public art.

Pindell, Howardena, M.F.A., 1967, Yale University: Painting and drawing.

Rubin, James H., Ph.D., 1972, Harvard University: 18th- and 19th-century art; art and politics.

Associate Professors

Dinkins, Stephanie, M.F.A., 1997, Maryland Institute College of Art: new media; photography.

Erickson, Christa, M.F.A., 1995, University of California, San Diego: Electronic installation; digital media; video art.

Frank, Barbara E., Ph.D., 1988, Indiana University: African, Mesoamerican, and African Diaspora art history.

Levine, Martin, M.F.A., 1972, California College of Arts and Crafts: Printmaking.

Lutterbie, John, Ph.D., 1983, University of Washington: Performance and theatre studies.

Nagasawa, Nobuho, M.F.A., 1985, Hochschule der Kunst Berlin, Germany: Sculpture.

Assistant Professors

Gerbracht, Grady, SMVisS (Master's of Science in Visual Studies), 1999, Massachusetts Institute of Technology: Visual and conceptual design; photography; digital media.

Goodarzi, Shoki, Ph.D., 1999, University of California, Berkeley: Ancient Near Eastern art.

Monteyne, Joseph, Ph.D., 2000, University of British Columbia, Canada: Early modern art history and criticism.

Adjunct Faculty, Technicians, and Professional Staff

Cassidy, James, *Technical Specialist and Lecturer*. M.A., 1986, Adelphi University: Photo/Printmaking Technician and Studios Manager.

Cooper, Rhonda, *Director of the University Gallery and Lecturer*. M.A., 1972, University of Hawaii: Far Eastern Art.

Harrison, Helen, *Lecturer and Director of the Pollock-Krasner House and Study Center*. M.A., 1975, Case Western Reserve University: American art.

Larese, Steven, *Technical Specialist and Lecturer*. M.F.A., 1975, University of Cincinnati: Visual Resources Curator; painting and drawing.

Mafucci, John, *Technical Specialist and Lecturer*. B.A., 1998, Stony Brook University: Sculpture Technician and Studios Manager.

Part-Time Faculty

Boddie, Terrie, *Adjunct Lecturer*. M.F.A., Hunter College, 1997: Photography.

Leslie, Richard, *Adjunct Lecturer*. Ph.D., 2003, Graduate Center of the City University of New York: 20th century; northern Baroque; and history of photography.

Mackie, Lisa, *Adjunct Lecturer*. M.F.A., 1972, University of Wisconsin, Madison: Printmaking.

Oberst, William, *Adjunct Lecturer*. M.F.A., 1997, Stony Brook University: Painting and drawing.

Paradis, Jason, *Adjunct Lecturer*. M.F.A., 1998, Stony Brook University: Painting and drawing.

Semergieff, Christopher, *Visiting Artist*. M.F.A., 1979, CUNY, New York.

Weil, Marianne, *Adjunct Lecturer*. M.F.A., 1986, School of Visual Arts: Sculpture and design.

Wingate, Jennifer. *Adjunct Lecturer*, Ph.D., 2002, Stony Brook University: American and 20th century art.

Number of teaching, graduate, and research assistants, fall 2005: 23

Degree Requirements Requirements for the M.A. Degree in Art History and Criticism

A. Course Requirements

The student will be required to complete successfully 36 credits of graduate work, as outlined in the list of courses below. A student must achieve a 3.0 overall grade point average to receive a degree from Stony Brook.

1. Required Courses (12 credits)

ARH 502 History of 19th-Century Art Criticism and Theory (3 credits)

ARH 503 History of 20th-Century Art Criticism and Theory (3 credits)

ARH 540 Methodologies of Art History (3 credits)

ARH 592 Teaching Practicum (see below)

2. Art History and Criticism (6 to 9 credits)

ARH 501 Theory and Criticism: From Antiquity through the Renaissance (3 credits)

ARH 591 Practicum in the Writing of Art Criticism (3 credits)

ARH 541 Topics in Ancient Art (3 credits)

ARH 542 Topics in Medieval Art (3 credits)

ARH 543 Topics in Renaissance Art (3 credits)

ARH 544 Topics in Early Modern Art (3 credits)

ARH 545 Topics in 19th-Century Art (3 credits)

ARH 546 Topics in 20th-Century Art (3 credits)

ARH 547 Topics in Global, Colonial, and Diasporic Art (3 credits)

ARH 548 Museum Studies Seminar (3 credits)

ARH 549 Topics in American Visual Culture (3 credits)

ARH 550 Inquiries into Art Criticism and Theory (3 credits)

ARH 551 Topics in Performance (3 credits)

ARH 552 Topics in Contemporary Art (3 credits)

ARH 554 Topics in Visual Culture (3 credits)

ARH 570 Issues in Architectural History and Criticism (3 credits)

3. Humanities and Social Sciences Electives (6 to 9 credits)

Two or three courses in the humanities and/or social sciences, to be chosen in consultation with a faculty advisor and with the approval of the Director of Graduate Studies. These courses may be in literary studies or criticism, history, musicology, dramaturgy, sociology, anthropology, etc., but cannot be in studio art.

4. Thesis Credits (3 to 6 credits)

ARH 598 Thesis (3 to 6 credits)

Note: A student who takes only two art history and criticism courses must take three humanities and social science electives, and vice versa. Total elective credits must be 15.

B. Comprehensive Examination

This test of basic competency is designed to assess the student's knowledge of particular periods in the history of art, individual artists, and works of art. It will include slide identifications and definitions of terms relevant to the history of art and art criticism. The student must

take this examination before the end of the third semester of study in order to continue in the program. An extension will be allowed to part-time students.

C. Foreign Language

A reading knowledge of French or German must be acquired before graduation. Students planning to advance to doctoral work will be encouraged to master both of these languages.

D. Teaching Requirement

All graduate students will be expected to assist in teaching a minimum of one semester. The course in which the student will assist shall ordinarily be an introductory-level undergraduate course. Competency in teaching will be judged through teacher evaluation questionnaires and classroom visits by the course's faculty supervisor.

E. Thesis

At the beginning of the third semester, the student, together with his or her directing committee, which shall consist of the student's advisor and one or two other faculty members, will jointly agree on a thesis topic. The student must at that time submit a prospectus outlining the nature and aims of the thesis. The thesis shall be a significant original work in the form of one or more essays relevant to the examination of art history, criticism, and theory.

Requirements for the M.F.A. in Studio Art

The department accepts only full-time students into the M.F.A. program.

A. Course Offerings

Courses are offered in painting, drawing, sculpture, printmaking, computer and electronic media, photography, ceramics, and ceramic sculpture. In addition, studio courses offered through other departments may satisfy area of concentration requirements, subject to approval by the studio art faculty and the Director of Graduate Studies.

B. Liberal Arts Requirement

Students are required to take three or four graduate liberal arts courses (in art history and criticism, literature, history, anthropology, philosophy, musicology, dramaturgy, and cultural studies, among others).

C. Demonstrations of Studio Proficiency

All M.F.A. candidates should demon-

strate proficiency through the development of a comprehensive body of work. Proficiency is determined by the faculty through periodic evaluation of the work, including mid-term and final critiques each semester, and thesis exhibition review by the student's thesis committee in the third year.

D. Final Year and One-Person Exhibition

During the final year, in addition to regular coursework, the student will prepare a one-person thesis exhibition for the Graduate Library Gallery or some other suitable venue on campus. As part of the thesis requirement, the student will submit to the department appropriate visual documentation (color slides, photographs, digital images, videos) of the exhibition and a written commentary that conforms to the Graduate School's requirements for master's theses. The written thesis should complement the visual work as an articulation of the student's thoughts and objectives within the broader context of arts and ideas. Third-year students will also participate in the University Art Gallery's annual M.F.A. group exhibition.

E. Teaching Requirement

All graduate students are required to assist in teaching a minimum of one semester; this course offers three credits toward the M.F.A. degree under ARS 531. In addition, the Art Department requires a preliminary semester of observing in the course to be taught under faculty supervision during the following semester. The semester of observation offers an optional three credits toward the degree. Beyond the three or six credits teaching practicum applied toward the degree, all other teaching by students with Teaching Assistantships is part of their obligation and is done without academic credit.

F. Course Requirements

The student will be required to complete successfully 60 credits of graduate work as outlined in the list of courses below. No graduate studio course may be taken for more than three credits per semester.

1. ARS 550 In Process Critique (3 credits) to be taken during the first year. May be repeated and counted toward studio credits.

2. At least nine graduate studio courses (27 credits).

3. Two semesters of ARS 580 Visual Arts Seminar (6 credits). Additional visual arts seminars are encouraged.

4. Three courses in graduate liberal arts, e.g., art history, languages, literature, philosophy, etc. (9 credits).

5. ARS 531 Graduate Teaching Practicum (see item E, above) (3 to 6 credits).

6. ARS 532 Thesis Project (up to 6 credits).

Requirements for the Ph.D. Degree in Art History and Criticism

A. Course Requirements

The student will be required to complete successfully 60 credits of graduate work, as outlined in the list of categories and courses below. A student must achieve a 3.0 overall grade point average to receive a degree from Stony Brook.

1. Required Courses (12 to 15 credits)

ARH 540 Methodologies in Art History (3 credits)

ARH 502 History of 19th-Century Art Criticism and Theory (3 credits)

ARH 503 History of 20th-Century Art Criticism and Theory (3 credits)

ARH 602 Practicum in Teaching (3 to 6 credits)

2. Electives (24 credits)

Students are required to take at least one course from each of the following three categories: Art History, Modern and Contemporary Visual Culture, and Art Criticism and Theory.

Art History

ARH 541 Topics in Ancient Art (3 credits)

ARH 542 Topics in Medieval Art (3 credits)

ARH 543 Topics in Renaissance Art (3 credits)

ARH 544 Topics in Early Modern Art (3 credits)

ARH 547 Topics in Global, Colonial, and Diasporic Art (3 credits)

ARH 549 Topics in American Visual Culture (3 credits)

ARH 690 Directed Readings (3 credits)

Modern and Contemporary Visual Culture

ARH 544 Topics in Early Modern Art (3 credits)

ARH 545 Topics in 19th-Century Art (3 credits)

ARH 546 Topics in 20th-Century Art (3 credits)

ARH 547 Topics in Global, Colonial, and Diasporic Art (3 credits)

ARH 549 Topics in American Visual Culture (3 credits)

ARH 551 Topics in Performance (3 credits)

ARH 552 Topics in Contemporary Art (3 credits)

ARH 554 Topics in Visual Culture (3 credits)

ARH 690 Directed Readings (3 credits)

ARS 580 Visual Arts Seminar (3 credits)

Criticism and Theory

ARH 501 Theory and Criticism: From Antiquity through the Renaissance (3 credits)

ARH 550 Inquiry in Art Criticism and Theory (3 credits)

ARH 551 Topics in Performance (3 credits)

ARH 552 Topics in Contemporary Art (3 credits)

ARH 554 Topics in Visual Culture (3 credits)

ARH 570 Issues in Architectural History and Criticism (3 credits)

ARH 591 Practicum in the Writing of Art Criticism (3 credits)

ARH 690 Directed Readings (3 credits)

3. Humanities and Social Science Electives (12 credits)

These courses may be in history, comparative studies, musicology, sociology, anthropology, etc., but cannot be in studio art.

4. Thesis Credits

ARH 699 Dissertation Research on Campus

ARH 700 Dissertation Research off Campus—Domestic

ARH 701 Dissertation Research off Campus—International

Credits for thesis preparation and research may be used to complete the total of 60 credits for the Ph.D.

B. Teaching Requirement

All Ph.D. students are expected to assist in teaching a minimum of two semesters. The first course in which the student will assist will ordinarily be an introductory level undergraduate course. An advanced doctoral student may also be assigned to assist in an upper-level undergraduate course. Competency in teaching is judged through teacher evaluation questionnaires and classroom visits by the course's supervising faculty member.

C. Comprehensive Examination

Information about the required comprehensive examination is found above under degree requirements for the M.A. Degree in Art History and Criticism. All Ph.D. students who enter the program without a master's degree in art history must take this examination before the end of the third semester of study in order to continue in the program. Ph.D. students who enter the program with an M.A. degree in art history will be exempted from taking the comprehensive examination.

D. M.A. Qualifying Paper

The M.A. qualifying paper is a paper completed in a graduate-level course and emended by the student in light of the suggestions or corrections of the faculty member to whom the paper was submitted. After the paper is revised, it will be read by another faculty member chosen by the student and the first reader. The second reader will approve or disapprove of the paper. If the second reader disapproves, the Graduate Program Director will select a third reader to judge the paper, and the opinion of the two readers will determine the approval or disapproval of the paper. This requirement is waived for Ph.D. students who enter the program with an M.A. degree in art history. Students may also opt to complete a full Master's thesis and receive the M.A. degree prior to continuing in the Ph.D. program.

E. Foreign Language Requirement

A reading knowledge of German and French is required for advancement to candidacy. In consultation with the candidate's advisor, the student may petition the Director of Graduate Studies to

replace one of these two languages with a different language more suitable for the student's projected area of research. Mastery of a third language may also be recommended if it is deemed necessary for the student's research.

F. Qualifying (Preliminary) Examination

The Qualifying Examination should be taken no later than the end of the third year of coursework (second year for those entering with a prior master's degree) and prior to the beginning of dissertation field work. It will be a written exam covering a major and minor, chosen from the following fields:

Major Fields

1. Contemporary Art
2. Modern Art
3. Visual and Material Culture
4. Sexuality and Gender Studies
5. Art Criticism, Theory, and Interpretation

Minor Fields

1. Ancient, Medieval, and Early Modern Art
2. Global, Colonial, and Diasporic Art
3. One of the major fields listed above

The content of the exam will vary according to the student's interests and their choice of major and minor fields. The student will be expected to select two faculty members to serve as major and minor advisors and to seek guidance from them on appropriate focus and bibliography in preparation for the exams. The Qualifying Exam committee consists of three members of the department faculty (including major and minor advisors) and is appointed by the Dean of the Graduate School upon the recommendation of the Graduate Studies Director. The format of the exam shall be five questions for the major, from which the student shall choose three; and three questions for the minor, from which the student shall choose two to answer in essay form.

G. Advancement to Candidacy

To be advanced to Ph.D. candidacy, the student must have:

1. Completed at least 54 graduate credits and all other degree requirements (see A-F listed above), other than the dissertation and dissertation research credits.

2. Submitted and defended a proposal outlining the nature and aims of the dissertation. The proposal must be approved by a faculty committee (see below). When all of these requirements have been completed satisfactorily, the Director of Graduate Studies will submit a request to the Dean of the Graduate School to advance the student to candidacy.

H. Dissertation

No later than the beginning of the seventh semester (fifth semester for those entering with a prior master's degree), the student will prepare a written prospectus, outlining the scope, method, and aims of the dissertation. The student will submit the proposal to the dissertation advisor and two other members of the department who will serve as readers, one of whom will serve as chair of the dissertation defense. After the student's advisor has conferred with the other committee members and the committee has approved the proposal, the advisor will submit the proposal and names of the committee members to the Director of Graduate Studies for approval. The Graduate Studies Director, in consultation with the student's dissertation committee, will name a reader from outside the department who has specialized in related areas.

At least eight weeks before the Graduate School's deadline for submitting the completed dissertation, the student will submit to the readers what is intended to be the final draft of the dissertation. No more than four weeks after that, if the readers have agreed that the dissertation is ready to be defended, the dissertation committee chairperson will schedule the defense, an oral examination open to interested faculty and graduate students. All four readers must recommend acceptance of the dissertation before it can be approved by the Graduate School.

I. Time Limit

All requirements for the Ph.D. degree must be completed within seven years after completing 24 hours of graduate courses in the department. In rare instances, the dean of the Graduate School will entertain a petition to extend this time limit, provided it bears the endorsement of the department chairperson.

Art History and Criticism Courses

ARH 501 Theory and Criticism: From Antiquity through the Renaissance

An examination of theoretical treatises and other writings on art from Antiquity through the Renaissance. The influence of theory on practice, and vice versa, is explored through close examination of selected monuments. Changing concepts of the artist's place in society are also studied as reflected in contemporary critical and expository writing. *SPD students prerequisite: Must receive permission from the department to enroll. Fall or spring, alternate years, 3 credits, ABCF grading. May be repeated for credit.*

ARH 502 History of 19th-Century Art Criticism and Theory

A study of European art criticism and theory of the 19th century stressing relationships between art and the history of ideas. Readings concentrate on primary sources, including reviews of art exhibitions (Diderot, Stendhal, Zola), artists' letters (Constable, Delacroix, the Impressionists), and treatises relating to art (Winckelmann, Proudhon, Ruskin). Special emphasis is given to Baudelaire. Comparisons are made between ways of seeing art as well as between critical and theoretical attitudes to artists' intentions. *SPD students prerequisite: Must receive permission from the department to enroll. Fall, 3 credits, ABCF grading.*

ARH 503 History of 20th-Century Art Criticism and Theory

The literature of art has expanded enormously in the 20th century—far beyond attempts to organize it developmentally or conceptually. An attempt is made to define types of criticism both in relation to the critics and their relation to the support system for the arts of which they are part. *SPD students prerequisite: Must receive permission from the department to enroll. Spring, 3 credits, ABCF grading.*

ARH 540 Methodologies of Art History

This graduate seminar is designed to engage students with the history and methods of the discipline of art history. Through close readings and focused discussions, the course examines issues raised by aesthetics, the problems of biography and "periodization," and the role of canon formation. Particular focus is directed toward the interpretive tools that have developed from within the discipline of art. In addition, also stressed is the interdisciplinary nature of art history through readings that discuss how lines of thought and critical inquiry emerging within other disciplines have had enormous influence on art history and criticism in the last two decades: semiotics, feminist theory, psychoanalysis, anthropology and post colonial theory, cultural studies, theories of mass culture and the post-modern, and the current debates about visual culture. *SPD students prerequisite: Must receive permission from the department to enroll. 3 credits, ABCF grading.*

ARH 541 Topics in Ancient Art

This course deals with a variety of topics relating to ancient art and its influence on later European art and artistic theory. Areas explored include ancient art history, aesthetics, and comparative criticism; Roman uses of Greek art; pagan imagery in early Christian and medieval art; antique art and the Renaissance (use of prototypes); collecting antiquities (from the Medici to Getty); archaeological exploration and publication in the 18th and 19th centuries; French neoclassicism; and the calligraphy of Greek vases (Hamilton, Blake, Flaxman, Ingres, Picasso). *SPD students prerequisite: Must receive permission from the department to enroll. Spring, alternate years, 3 credits, ABCF grading. May be repeated for credit.*

ARH 542 Topics in Medieval Art

A topic in medieval art or architecture, such as early medieval manuscript illumination, ornament and design, or the Gothic cathedral, is selected and explored during the semester in lectures, discussions, and student reports or papers. *SPD students prerequisite: Must receive permission from the department to enroll. Spring, alternate years, 3 credits, ABCF grading. May be repeated for credit.*

ARH 543 Topics in Renaissance Art

This course, usually a seminar, deals with one or several of the following aspects of Renaissance art: iconographic problems, style and connoisseurship (including the study of individual works at the Metropolitan Museum or the Frick), patronage and its effect on the form and content of a work, the exchange of artistic ideas between northern and southern Europe, and Renaissance sources in antiquity and the Middle Ages. *SPD students prerequisite: Must receive permission from the department to enroll. Spring, alternate years, 3 credits, ABCF grading. May be repeated for credit.*

ARH 544 Topics in Early Modern Art

This seminar examines methodological developments and historical issues related to the art and visual culture of the early modern period. Though we are concerned with objects, discourses, and practices emerging in the seventeenth century, we also approach these through the perspective of contemporary critical tools (for example, theories of urban space, spectacle, and representation; psychoanalysis, sexuality and subjectivity; coloniality and the encounter with New World otherness; semiotics and the construction of absolutist power). Students are encouraged to engage with these issues through the study of traditional high art objects as well as through other forms of representation emerging in the early modern period—for example, scientific illustration, more ephemeral forms of print culture, and even urban and courtly spectacle. *SPD students prerequisite: Must receive permission from the department to enroll.*

Spring, alternate years, 3 credits, ABCF grading
May be repeated for credit

ARH 545 Topics in 19th-Century Art

Selected topics in 19th-century art with an emphasis on interdisciplinary approaches to interpretation. Possible topics include politics and art during the French Revolution; English landscape painting and the theory of the picturesque; and French realism and mid-19th-century social thought.

SPD students prerequisite: Must receive permission from the department to enroll
Spring, alternate years, 3 credits, ABCF grading
May be repeated for credit

ARH 546 Topics in 20th-Century Art

Twentieth-century art considered as an international movement, European and American, although national groups may be studied. Emphasis varies with topics ranging over stylistic analysis, iconographical interpretations, and theoretical studies. Students are expected to undertake original research and interpretation.

SPD students prerequisite: Must receive permission from the department to enroll
Spring, alternate years, 3 credits, ABCF grading
May be repeated for credit

ARH 547 Topics in Global, Colonial, and Diasporic Art

This course examines various issues in the appreciation, interpretation and appropriation of non-Western art. Emphasis is on developing a critical approach to these arts and the manner in which they have been represented and misrepresented in the Western imagination. Topics vary, but may include exploration of themes in the so-called traditional arts of Africa, Oceania, Native and Latin America, the transformations of these arts during the colonial period, issues of identity and the consequences of dislocation versus sense of place in the diaspora, and contemporary expressions of non-Western artists on the global scene.

SPD students prerequisite: Must receive permission from the department to enroll
Spring, alternate years, 3 credits, ABCF grading
May be repeated for credit

ARH 548 Museum Studies

Through a combination of field trips, visiting lecturers, group discussion, and student projects, the course surveys the diverse aspects of the museum field, including management, curatorship, exhibitions, public relations, conservation, and other areas of administration and professional practice.

SPD students prerequisite: Must receive permission from the department to enroll
3 credits, ABCF grading

ARH 549 Topics in American Visual Culture

This course examines selected issues in the history of American art and material culture. The course focuses upon, but is not necessarily limited to, the United States. Topics include public art and public culture;

approaches to the study of material culture; art and commercial and/or popular culture; art and regional locations; realism; imaging the West; cross-cultural exchanges in art of the United States. (May be used to fulfill 20th-century requirement when material deals with 20th-century art.)

SPD students prerequisite: Must receive permission from the department to enroll
Spring, alternate years, 3 credits, ABCF grading
May be repeated for credit

ARH 550 Inquiries into Art Criticism and Theory

This course deals with the theoretical approaches to the study of art that cross historical boundaries. Topics vary from semester to semester. They may be an expansion of one of the areas generally covered in ARH 540, such as psychology of art or the iconography of architecture. Other investigations may focus on subjects requiring a special methodological approach, such as the theory and history of ornament and design or the role of public art.

SPD students prerequisite: Must receive permission from the department to enroll
Fall or spring, alternate years, 3 credits, ABCF grading
May be repeated for credit

ARH 551 Topics in Performance

The history and theories of performance are explored. Topics may be the performing body, performance and political action, avant-garde performance, performing and artifact, virtual performance, performance and identity. Depending on the topic, there may be a performance and/or computer based projects.

3 credits, ABCF grading

ARH 552 Topics in Contemporary Art

The course will examine the latest developments in visual art and architecture, beginning with the Neo-Expressionism and Neo-Conceptualism of the 1980s and extending to installation and video art. Postmodernist and activist art will be examined in particular detail, and contextualized in terms of the broader patterns of 20th-century art.

Fall or spring, 3 credits, ABCF grading
May be repeated for credit

ARH 553 Contemporary Art in New York

A systematic survey of contemporary art on view in museums and galleries in New York. The class would alternate between gallery/museum visits and interpretative analyses of the work in the classroom. A variety of theoretical approaches will be used and the full range of contemporary pluralism will be examined. Contemporary art will be understood as both a manifestation of contemporary society and in terms of its larger art historical context and significance. The New York art scene is the richest in the world. The class offers the student the opportunity for direct, informed contact with it.

3 credits, ABCF grading

ARH 554 Topics in Visual Culture

This class examines issues in the interdisciplinary field of visual culture. Visual culture studies look at the dynamic state of visual

media in contemporary life and their historical origins, seeking to relate art and film to the mass media and digital culture.

Fall or spring, 3 credits, ABCF grading
May be repeated for credit

ARH 570 Issues in Architectural History and Criticism

This course examines a series of topics that link architecture with other critical disciplines. Among the topics that may be addressed are architectural theory and the theories of language; the history of proportion and the construction of gender; and Orientalism.

SPD students prerequisite: Must receive permission from the department to enroll
Fall or spring, alternate years, 3 credits, ABCF grading
May be repeated for credit

ARH 580 Art Criticism or Gallery Internship

An internship offering practical experience in some aspect of the field of art history and criticism, such as gallery and curatorial work in an on-campus or off-campus gallery or museum, or journalistic experience with an art or criticism publication such as the Art Department journal *Art Criticism*.

Prerequisite: Good standing in the graduate Art History and Criticism program
SPD students prerequisite: Must receive permission from the department to enroll
Fall and spring, 1-3 credits, S/U grading
May be repeated twice for credit

ARH 581 Materials, Methods, and Techniques of Studio Art

Through reading, discussion, and demonstration, this course explores the media and techniques used in making art throughout history, concentrating on the medieval through contemporary periods. Relationships between development of media and techniques and the history of style and social context of art are also examined. Studios and shops of the Department of Art are utilized to demonstrate, for example, etching and lithography, bronze casting, and other processes. Guest lectures, field trips to conservation facilities, and gallery and museum assignments are employed, and toward the end of the course the student produces a painting stretched, sized, and primed in the traditional manner.

SPD students prerequisite: Must receive permission from the department to enroll
Spring, 1-3 credits, ABCF grading

ARH 591 Practicum in the Writing of Art Criticism

This course is designed as a practicum in the writing of art criticism under the supervision of the faculty.

SPD students prerequisite: Must receive permission from the department to enroll
Fall and spring, 3 credits, S/U grading
May be repeated twice for credit

ARH 592 Practicum in Teaching

Instruction in the department under the supervision of the faculty. (This course may not be included more than once in the courses taken in fulfillment of the 36 credit hour requirement.)

Fall and spring, 3 credits, S/U grading

ARH 595 Directed Readings in Art History, Criticism, and Theory

An independent reading course to be arranged with a particular faculty member. Normally, this course is reserved for second year Masters students who have fulfilled most of their course requirements and for whom the proposed program of study cannot be completed within other existing course structures.

*Fall and spring, 3 credits, ABCF grading
May be repeated for credit*

ARH 598 Thesis

Prerequisite: Completion of all degree requirements

Fall, spring, and summer, 1-6 credits, S/U grading

May be repeated for credit up to six credits

ARH 602 Teaching Practicum, Advanced

Instruction in the department by advanced graduate students under the supervision of faculty.

3 credits, S/U grading

May be repeated twice for credit

ARH 690 Directed Readings for Doctoral Candidates

An independent reading course to be arranged with a particular faculty member. Normally, this course is reserved for advanced Ph.D. students who have fulfilled most of their course requirements and for whom the proposed program of study cannot be completed within other existing course structures.

*Fall and spring, 1-9 credits, ABCF grading
May be repeated for credit*

ARH 699 Dissertation Research on Campus

Prerequisite: Must be advanced to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab

*Fall, spring, and summer, 1-12 credits, S/U grading
May be repeated for credit*

ARH 700 Dissertation Research off Campus-Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on-campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

ARH 701 Dissertation Research off Campus-International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside of the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact

the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

ARH 800 Summer Research**Studio Art Courses****ARS 520 Special Projects for M.F.A. Candidates**

Advanced projects in areas that may not be included in the M.F.A. curriculum, utilizing the unique talents of regular and visiting faculty, the facilities of the Art department, or other aspects of the university environment, and possibly facilities at other locations or institutions.

Prerequisites: Faculty sponsor, permission of Graduate Studies Director; enrollment in M.F.A. program or permission of instructor

*Fall, spring, and summer, 1-9 credits, ABCF grading
May be repeated for credit*

ARS 525 Electronic Media

An exploration of the experimental artistic practices utilizing computer and electronic technologies: digital imaging, video and audio, Web and CD-rom production, and interactive installation. It will provide practical instruction in the use of computer media with an orientation towards relating this to the graduate student's own practice. It will also analyze the unique possibilities of this hybrid and developing art form through theoretical readings and examination of recent works, exhibitions, festivals, and the Web.

Prerequisite: Enrollment in M.F.A. program or permission of instructor

*Fall and spring, 3 credits, ABCF grading
May be repeated for credit*

ARS 530 Professional Experience Internship

Internship in the professional art world of New York City and its environs. Depending on the career objectives of the M.F.A. candidate, the student may choose to intern at a foundry, printmaking atelier, art gallery or museum, known artist's studio, or related facility or institution.

Prerequisite: Enrollment in M.F.A. program or permission of instructor

Fall, spring, and summer, 1-3 credits, S/U grading

May be repeated twice for credit

ARS 531 Graduate Teaching Practicum

Supervised teaching practicum in undergraduate studio or studio theory course.

Prerequisite: Accepted candidate for M.F.A.; enrollment in M.F.A. program or permission of instructor

*Fall and spring, 1-3 credits, S/U grading
May be repeated twice for credit*

ARS 532 Thesis Project

Preparation of thesis under the program advisor.

Prerequisite: Enrollment in M.F.A.

program or permission of instructor

*Fall, spring, and summer, 1-6 credits, S/U grading
May be repeated for credit*

ARS 535 Projects in Studio Art

Projects in studio art, field, and media to be determined on a per semester basis by the individual instructor.

3 credits, ABCF grading

May be repeated twice for credit

ARS 540 Graduate Photo Studio

Photographic studio, theory, and laboratory emphasizing individual development as a photographer. Color and black-and-white studios and darkrooms. Fine arts, reportage, illustration, commercial, and industrial.

Prerequisite: Enrollment in M.F.A. program or permission of instructor

*Fall and spring, 3 credits, ABCF grading
May be repeated for credit*

ARS 541 Photographing Works of Art

Graduate-level course for art history and criticism students, studio art students, and others examining in detail the techniques of photographing works of art and architecture and of photo reproduction; black-and-white and color work for portfolio, publication, teaching, cataloging slide and photograph collections, etc. No laboratory work.

Prerequisite: Graduate standing in Art History and Criticism or Studio Art or permission of department; enrollment in M.F.A. program or permission of instructor

1-2 credits, ABCF grading

ARS 550 In Process Critique

Graduate theory and practice of art, investigating historical and contemporary concepts, concentrating on individual development as an artist. Conceptual, environmental and wide ranging solutions are encouraged. REquired for first year MFA's, this course culminates in a body of work for the end of the year First Year Exhibition. The course also provides students with vigorous critical feedback throughout this process, augmenting it with readings and discussions of related New York City exhibitions in galleries and museums to inform the development of their work.

Prerequisite: Enrollment in M.F.A. program or permission of instructor

*Spring, 3 credits, ABCF grading
May be repeated for credit*

ARS 551 Graduate Painting Studio

Studio and theory in painting and related visual forms, with instruction and facilities available in all media and techniques; emphasis on individual development as an artist. Models and space for environmental and conceptual works available.

Prerequisite: Enrollment in M.F.A. program or permission of instructor

*Fall and spring, 3 credits, ABCF grading
May be repeated for credit*

ARS 560 Graduate Sculpture Studio

Theory and practice of sculpture for the graduate student, with instruction and facilities available in all media and techniques; emphasis on individual development as an artist. Studio facilities include air, electric, and hydraulic power equipment; TIG, MIG, Arc, and flame welding; forging; woodworking; modeling, molding, and casting facilities for clay, wax, plaster, and plastics; and metal casting capabilities in investment, shell, sand, and centrifugal.

*Prerequisite: Enrollment in M.F.A. program
or permission of instructor*

*Fall and spring, 3 credits, ABCF grading
May be repeated for credit*

ARS 561 Graduate Ceramics and/or Ceramic Sculpture Studio

Theory and practice of ceramics and ceramic sculpture for the graduate student with emphasis on individual development as an artist. Advanced studio instruction in hand-building: coil, slab, pinch; wheelthrowing; casting, inclusive of multipiece plaster pour-molds; various firing techniques: reduction, oxidation, raku, and high- and low-fire glaze techniques.

*Prerequisite: Enrollment in M.F.A. program
or permission of instructor*

*Fall and spring, 3 credits, ABCF grading
May be repeated for credit*

ARS 570 Graduate Printmaking Studio

Graduate studio in the theory and practice of printmaking. Color, black-and-white, and photographic processes in plate and stone lithography, serigraphy, relief, and intaglio, emphasizing the student's individual development as an artist.

*Prerequisite: Enrollment in M.F.A. program
or permission of instructor*

*Fall and spring, 3 credits, ABCF grading
May be repeated for credit*

ARS 580 Visual Arts Seminar

Required seminar and critique throughout the M.F.A. curriculum. Guest speakers, artists, and critics; demonstrations and lectures; seminars; individual and group critiques. The M.F.A. candidate, as part of this seminar, regularly participates in critiques in which his or her work is analyzed by guest faculty and art history/criticism faculty and graduate students, as well as by his or her peers. The visual arts seminar, where applicable, includes field trips and assignments of special lectures, panels, seminars, and other events of the professional art world.

*Prerequisite: Enrollment in M.F.A. program
or permission of instructor*

*Fall and spring, 3 credits, ABCF grading
May be repeated for credit*

ARS 591 Graduate Design Studio

Graduate theory and practice of two- and three-dimensional design; projections; perspective; maquettes; various techniques, including airbrush and experimental; and conceptual development of ideas, leading to completion of a design idea or design research project.

*Prerequisite: Enrollment in M.F.A. program
or permission of instructor*

*3 credits, ABCF grading
May be repeated for credit*

ARS 800 Summer Research



Biochemistry and Structural Biology (BSB)

Chairperson, Department of Biochemistry and Cell Biology: William J. Lennarz, Life Sciences Building 450 (631) 632-8550

Graduate Program Director: Robert Haltiwanger, Life Sciences Building 470 (631) 632-7336

Senior Staff Assistant: Carol Juliano, Life Sciences Building 336 (631) 632-8533

Degree awarded: Ph.D. in Biochemistry and Structural Biology

The Biochemistry and Structural Biology Graduate Program stresses biochemical, structural, and computational approaches to solving complex biological problems. Training is offered in a broad range of research areas leading to the Ph.D. degree. Research in biochemistry and structural biology includes structure-function studies of proteins and nucleic acids, the molecular basis of gene expression, the chemical basis of enzyme action, as well as membrane and carbohydrate biochemistry. The aim of structural biology is to obtain high-resolution structures of biological macromolecules and molecular complexes through experimental techniques such as nuclear magnetic resonance (NMR) spectroscopy and X-ray diffraction in order to provide a view of biology at the molecular and atomic levels. High-resolution structures combined with biochemical studies represent the blueprints for understanding enzyme catalysis, cell signaling and transport, gene expression and regulation, and numerous other cellular processes. Advances in instrumentation and computational analysis have laid the groundwork for structure determination of proteins discovered through genome sequencing efforts and have opened up structural studies on membrane proteins and large complexes of proteins and nucleic acids.

The program includes faculty from the Departments of Biochemistry and Cell Biology, Chemistry, Physiology and Biophysics, and the Pharmacological Sciences, as well as from Brookhaven National Laboratory.

For more information, visit the BSB Web site at www.sunysb.edu/bsb.

Facilities

State-of-the-art facilities are available for biochemistry and structural biology. The Center for Structural Biology has several high-field NMR instruments and facilities for X-ray crystallography. With close ties to the Brookhaven National Laboratory, Stony Brook takes advantage of the high-energy beam lines for diffraction studies. Throughout

the program there is state-of-the-art equipment for protein purification and analysis, including Raman, infrared, fluorescence, and CD spectrophotometers. The biological sciences complex also has tissue culture facilities, a transgenic mouse facility, and a centralized *Drosophila* facility. These facilities are supported by a wide range of instrumentation for cell and molecular biology including transmission and scanning electron microscopes, confocal microscopes, and phosphoimagers.

Admission

Graduate studies in Biochemistry and Structural Biology require the following in addition to the Graduate School admissions requirements:

A. A bachelor's degree with the following minimal preparation: mathematics through one year of calculus; chemistry, including organic and physical chemistry; general physics; and one year of biology;

B. Letters from three previous instructors;

C. Graduate Record Examination (GRE) General Test scores;

D. Acceptance by the Graduate Program in Biochemistry and Structural Biology and by the Graduate School.

In special cases, students not meeting all of the requirements listed in item A above may be admitted, but such deficiencies must be remedied.

Faculty

Distinguished Professors

Grollman, Arthur P.⁴, M.D., 1959, Johns Hopkins Medical School: Mechanisms of chemical mutagenesis/carcinogenesis.

Lennarz, William J.¹, *Chairperson*, Ph.D., 1959, University of Illinois: Biosynthesis and function of glycoproteins in cell-cell interactions.

Sternglanz, Rolf², Ph.D., 1967, Harvard University: Chromatin structure and function in yeast; histone modifying.

Professors

Brown, Deborah¹, Ph.D., 1987, Stanford University: Structure and function of caveolae and cholesterol/sphingolipid-rich membrane domains.

Deutsch, Dale¹, Ph.D., 1972, Purdue University: Molecular neurobiology of anandamide (the endogenous marijuana) regulation.

Gergen, J. Peter¹, Ph.D., 1982, Brandeis University: Transcriptional regulation in development; structure and function of Runt domain proteins.

Haltiwanger, Robert¹, Ph.D., 1986, Duke University: Glycobiology; role of protein glycosylation in signal transduction; notch signaling.

London, Erwin¹, Ph.D., 1979, Cornell University: Membrane protein structure/translocation/folding; structure and function of sphingolipid/cholesterol rafts in membranes.

McLaughlin, Stuart³, Ph.D., 1968, British Columbia: Calcium/phospholipid second messenger system.

Miller, W. Todd³, Ph.D., 1989, Rockefeller University: Tyrosine phosphorylation and signal transduction.

Raleigh, Daniel P.⁴, Ph.D., 1988, Massachusetts Institute of Technology: Experimental studies of protein folding and amyloid formation.

Sampson, Nicole⁴, Ph.D., 1990, University of California, Berkeley: Protein structure-function; mammalian fertilization.

Scarlata, Suzanne², Ph.D., 1984, University of Illinois: Structure/oligomerization of membrane proteins.

Simon, Sanford R.¹, Ph.D., 1967, Rockefeller University: Proteinases and their inhibitors in invasiveness in inflammation and tumor metastasis; inhibitor of bacterial metalloproteinases.

Smith, Steven O.¹, Ph.D., 1985, University of California, Berkeley: Structure and function of membrane proteins.

Staros, James V.¹, Ph.D., 1974, Yale University: Biochemical and biophysical approaches to signal transduction by ErbB family receptors.

Tonge, Peter J.⁴, Ph.D., 1986, University of Birmingham, England: Tuberculosis pathogenesis and drug discovery; enzyme mechanisms and rational inhibitor design; fluorescent proteins.

Associate Professors

Holdener, Bernadette¹, Ph.D., 1990, University of Illinois: The role of protein folding in WNT signal transduction and development.

Kisker, Caroline⁴, Ph.D., 1994, Free University Berlin, Germany: Structural and functional studies on DNA repair enzymes; DNA polymerases and structure-based drug design.

Neiman, Aaron¹, Ph.D., 1994, University of California, San Francisco: Vesicle trafficking and intracellular signaling in yeast.

Schindelin, Hermann¹, Ph.D., 1994, Free University Berlin, Germany: Structure and function of proteins involved in ubiquitin-dependent protein degradation and neuro-receptor anchoring.

Simmerling, Carlos L.⁴, Ph.D., 1991, University of Illinois: Development of tools for efficient simulation of chemical systems and using them to study the structure and dynamics of molecules involved in biological processes.

Thomsen, Gerald H.¹, Ph.D., 1988, Rockefeller University: Regulation of early vertebrate development by growth factor signals; ubiquitin modification; T box family transcription factors.

Assistant Professors

de los Santos, Carlos², Ph.D., 1987, Buenos Aires, Argentina: Solution structures of damaged DNA; structural basis of chemical mutagenesis, lesion recognition, and DNA repair.

Hsieh, Jen-Chih¹, Ph.D., 1994, Duke University: Wnt signaling in embryo development and carcinogenesis.

Karzi, Wali¹, Ph.D., 1995, Johns Hopkins University: Structure-function studies of RNA-protein interactions.

Nassar, Nicolas³, Ph.D., 1992, Joseph Fourier, France: X-ray structures of signal transduction components.

Rizzo, Robert⁶, Ph.D., 2001, Yale University: Computational biology; drug design.

Wang Jin⁴, Ph.D., 1991, University of Illinois: Fundamental mechanism of biomolecular folding and recognition, especially protein folding and protein-protein/protein-DNA interactions.

Scientists

Fu, Dax⁵, 1996, Mayo Graduate School of Medicine: X-ray crystallography of membrane protein transporters and channels.

Li, Huilin⁵, Ph.D., 1994, University of Sciences and Technology, Beijing, China: Structural biology of macromolecular assemblies and membrane proteins by cryo-electron microscopy.

Shanklin, John⁵, Ph.D., 1988, University of Wisconsin-Madison: Structure-function relationships of lipid modification enzymes.

Ubramanyan, Swaminathan⁵, Ph.D., 1980, University of Madras, India: Structure-function relationships of bacterial toxins.

Number of teaching, graduate, and research assistantships, fall 2005: 32

1) Department of Biochemistry and Cell Biology

2) Department of Pharmacological Sciences

3) Department of Physiology and Biophysics

4) Department of Chemistry

5) Brookhaven National Laboratory

6) Department of Applied Mathematics and Statistics

Degree Requirements Requirements for the Ph.D. Degree

A. Course Requirements

Core courses:

1. Graduate Biochemistry I (MCB 520)

2. Membrane Biochemistry (BSB 517)

3. Computational Methods in Biochemistry and Structural Biology (BSB 515)

4. Physical Biochemistry (MCB 512)

5. Cell Biology (MCB 656) or Molecular Genetics (MCB 503)

6. Experimental Projects in Biochemistry and Structural Biology (BSB 509/510), a two-semester course in which the students spend two months in each of three different faculty laboratories actively participating in the research work of the laboratory.

7. Enrollment every semester in Colloquium in Biochemistry and Structural Biology (BSB 601/602), a series of invited lectures by visiting scientists from other institutions.

8. Two electives from an approved list of biochemistry, chemistry, molecular, and cell biology courses.

9. Enrollment for one semester of Journal Club (BSB 532) in the first and second years.

10. Enrollment for one semester of Student Seminar (BSB 603/604) in the third, fourth, and fifth years.

11. Enrollment in the first year in Ethics (GRD 500).

B. Qualifying Examination

At the beginning of the fourth semester, all students take a written qualifying examination covering the material from the core courses. This examination tests the student's ability to integrate basic concepts and information from the core courses.

C. Research Proposal

After passing the written qualifying examination, each student is required to prepare and defend a research proposal based on their own research. The student presents a detailed writeup of the background and logic of the proposition to test it, which then forms the basis for

an oral proposition examination. The qualifying examination and the proposition examination together constitute the preliminary examination specified in the regulations of the Graduate School.

D. Advancement to Candidacy

When the above requirements have been satisfactorily completed, a recommendation for advancement to candidacy for the Ph.D. will be forwarded to the Graduate School.

E. Dissertation

During the second year, the student initiates a dissertation research project in the laboratory of a particular member of the program faculty. After the student has passed the proposition examination, a research committee is appointed to guide the dissertation research, and when the research nears completion, a dissertation examining committee is approved by the dean of the Graduate School.

F. Dissertation Defense

The dissertation defense, which completes the requirements for the Ph.D., consists of a public seminar presentation of the dissertation work followed by an oral examination before the dissertation examining committee.

G. Teaching Experience

All students in molecular biology and biochemistry, whether or not they are supported by teaching assistantships, are required to gain experience in teaching by assisting in laboratory sections, leading discussion sections, or helping to formulate and grade examination papers. The teaching experience may be in either undergraduate or graduate courses, and extends over a period of two semesters.

H. Residence Requirement

The University requires at least two consecutive semesters of full-time graduate study. The demands of the course of study necessitate a longer period of residence.

Courses

BSB 509 Experimental Biochemistry and Structural Biology

An introduction to modern biochemical research techniques. The student spends two-thirds of a semester in the laboratory of each of three different members of the faculty. In each laboratory, the student participates in some aspect of the research being pursued by the faculty member.

*Fall and spring, 1-6 credits, ABCF grading
May be repeated for credit*

BSB 510 Experimental Biochemistry and Structural Biology

An introduction to modern biochemical research techniques. The student spends two-thirds of a semester in the laboratory of each of three different members of the faculty. In each laboratory, the student participates in some aspect of the research being pursued by the faculty member.

*Fall and spring, 1-6 credits, ABCF grading
May be repeated for credit*

BSB 515 Computational Methods in Biochemistry and Structural Biology

Computational methods used in sequence searching and analysis, bioinformatics, graphical analysis of proteins, and nucleic acids.

Prerequisite: This class is restricted to first year BSB, HBM, and HBH Ph.D. students and second year MCB Ph.D. students; exception requires approval from the course instructor

Fall, 1 credit, S/U grading

BSB 517 Membrane Biochemistry

Examines the molecular architecture of membranes; the organization, function and assembly of lipids and proteins in biological membranes.

*Fall, 1 credit, ABCF grading
May be repeated for credit*

BSB 531 Journal Club in Biochemistry and Structural Biology

Provides students with a forum for acquiring skills involved in the critical analysis and presentation of scientific data by active participation in seminars of major topics in structural biology and biochemistry, and critical discussion of selected topics with presentation of papers from the literature.

*Fall and spring, 1 credit, ABCF grading
May be repeated for credit*

BSB 532 Journal Club in Biochemistry and Structural Biology

Provides students with a forum for acquiring skills involved in the critical analysis and presentation of scientific data by active participation in seminars of major topics in structural biology and biochemistry, and critical discussion of selected topics with presentation of papers from the literature.

*Spring, 1 credit, ABCF grading
May be repeated for credit*

BSB 580 Advanced Structural Biology

Advanced topics in NMR spectroscopy and structural biology.

*Spring, 2 credits, ABCF grading
May be repeated for credit*

BSB 581 Teaching Honors

Selected students whose performance in the basic required courses for the graduate program is in the top 10 percent conduct tutorials for first-year graduate students in the program and other students taking graduate courses for credit. The tutors are supervised and graded by faculty of the graduate program. Successful completion of this course

makes students eligible to receive "Honors in Teaching" on their transcripts.

*Fall and spring, 1 credit, S/U grading
May be repeated for credit*

BSB 599 Research

Original investigation undertaken with the supervision of a faculty member prior to advancement to candidacy.

*Fall and spring, 1-12 credits, S/U grading
May be repeated for credit*

BSB 601 Colloquium in Biochemistry and Structural Biology

A weekly series of talks and discussions by visiting scientists covering current research and thinking in various aspects of structural biology and biochemistry.

*Fall, 1 credit, S/U grading
May be repeated for credit*

BSB 602 Colloquium in Biochemistry and Structural Biology

A weekly series of talks and discussions by visiting scientists covering current research and thinking in various aspects of structural biology and biochemistry.

*Spring, 1 credit, S/U grading
May be repeated for credit*

BSB 603 Student Seminars in Biochemistry and Structural Biology

Seminars given by graduate students on the progress of their own thesis research. Required of all students every semester in which they are registered in the Graduate Program in Biochemistry and Structural Biology. Attendance is mandatory. Visitors are welcome.

Prerequisite: Must be registered in the BSB program

*Fall and spring, 1 credit, S/U grading
May be repeated for credit*

BSB 604 Student Seminars in Biochemistry and Structural Biology

Seminars given by graduate students on the progress of their own thesis research. Required of all students every semester in which they are registered in the Graduate Program in Biochemistry and Structural Biology. Attendance is mandatory. Visitors are welcome.

*Fall and spring, 1 credit, S/U grading
May be repeated for credit*

BSB 699 Dissertation Research on Campus

Original investigations undertaken as part of the Ph.D. program under supervision of a research committee.

Prerequisite: Advancement to candidacy (G5); major portion of research must take place on SBU campus or at Brookhaven National Laboratory

*Fall, spring, and summer, 1-12 credits,
S/U grading*

May be repeated for credit

BSB 700 Dissertation Research off Campus-Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S.

provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

*Fall, spring, summer, 1-9 credits, S/U grading
May be repeated for credit*

BSB 701 Dissertation Research off Campus-International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

*Fall, spring, summer, 1-9 credits, S/U grading
May be repeated for credit*

BSB 800 SUMMER RESEARCH

0 credits, S/U grading

Biomedical Engineering (BME)

Chair: Clinton T. Rubin, Psychology A, 3rd Floor (631) 632-2302

Graduate Program Director: Michael Hadjiargyrou, Psychology A, 3rd Floor (631) 632-1480

Administrative Staff Assistant: Anne Marie Dusatko, Health Sciences Center T18-030 (631) 444-2303

Degrees awarded: M.S. in Biomedical Engineering; Ph.D. in Biomedical Engineering

Biomedical engineering is at the forefront of medicine's technologic revolution; its many successes have raised expectations for the prevention, diagnosis, and treatment of disease. Faculty at the State University of New York at Stony Brook have been active contributors to the cutting edge of this technology, and our University is building on internationally acclaimed strengths in Bioelectromagnetics, Biomechanics, Biomaterials, Biotechnology, Tissue Engineering, Instrumentation and Medical Imaging. These disciplines thrive through active interdisciplinary collaborations among the faculty in the College of Engineering and Applied Sciences, the School of Medicine, and the College of Arts and Sciences, all of which are in close proximity. This ongoing biomedical research, combined with unique facilities at the University, Brookhaven National Laboratory, and Cold Spring Harbor Laboratory have helped distinguish Stony Brook as a superb resource for education in both the engineering and health sciences. With these intellectual and physical resources, the program in Biomedical Engineering is positioned to provide a rigorous, cross-disciplinary graduate training and research environment for our students.

This is a very exciting time for Biomedical Engineering. New areas are opening each day, ranging from the engineering of tissues to making outer space habitable for mankind. It is an excellent time to begin your studies in Biomedical Engineering and we believe you will find Stony Brook a superb place to train. Our faculty is diverse, our commitment is high, and our facilities are unique. If there are any questions we can address, please contact us directly.

The Graduate Program in Biomedical Engineering at Stony Brook University trains individuals with baccalaureate degrees in engineering, applied mathematics, and the sciences to provide them with the synthesis, design, and analysis skills necessary to contribute effectively to the advancement of technology in health and medical care. The M.S. and Ph.D. degree programs are specifically

designed to provide graduate students and engineering professionals with the knowledge and skills necessary to transfer recent developments in the basic sciences into commercially viable products and processes. Training of the student is accomplished by exposing the individual to the biology, engineering, and business concepts critical to succeeding in the biomedical research and development environment.

Training in Biomedical Engineering is directed by faculty from the College of Engineering and Applied Sciences, School of Medicine, College of Arts and Sciences, Health Sciences Center, as well as from Brookhaven National Laboratory and Cold Spring Harbor Laboratory. These diverse faculty provide a spectrum of research opportunities. Breadth and depth of exposure is a hallmark of the program, and one which we believe emphasizes the importance of multidisciplinary, collaborative approaches to real-world engineering problems in biology and medicine. Graduate training includes course instruction, participation in seminar courses, and extensive involvement in selected projects emphasizing synthesis and design skills. The graduate program is based in the Health Sciences Center, adjacent to University Hospital, and in close proximity to the Basic Sciences, Engineering, and Business Schools.

Admission

Students may matriculate directly into either the M.S. or Ph.D. programs. For admission to the Program in Biomedical Engineering, the following are normally required:

A. A four-year undergraduate degree in engineering or related field such as the physical sciences or mathematics;

B. An official transcript of undergraduate record and of any work completed at the graduate level;

C. Letters of recommendation from three previous or current instructors/employers;

D. Submission of a personal statement outlining your background, interests, and career goals in the field of biomedical engineering;

E. Graduate Record Examination (GRE) General Test scores;

F. Acceptance by both the Program and the Graduate School.

Stipends and tuition scholarships are available for selected students. Distribution of these awards will be based on GRE test scores, undergraduate performance, professional experience, and research/career objectives as outlined in a personal statement.

Faculty

Distinguished Professor

Chu, Benjamin, Ph.D., 1959, Cornell University: Synthesis; characterization and processing of biomaterials; molecular manipulation and self-assembly in biomimetic mineralization; DNA complexation for gene therapy.

Professors

Benveniste, Helene, Ph.D., 1991, University of Copenhagen, Denmark: Understanding diagnostic MR contrast parameters suitable to visualize neuro-pathology in neurodegenerative diseases.

Brink, Peter, Ph.D., 1976, University of Illinois: Biophysical properties of gap junction properties.

Chiang, Fu-Pen, Ph.D., 1966, University of Florida: Development and application of various optical techniques such as moiré, holographic, interferometry, and speckle interferometry for stress analysis; nondestructive evaluation and metrology.

Clark, Richard, M.D., 1971, University of Rochester: Tissue engineering in wound repair.

Cohen, Ira, M.D., Ph.D., 1974, New York University: Electrophysiology of the heart.

Djuric, Petar, Ph.D., 1990, University of Rhode Island: Acoustic signal processing.

Fowler, Joanna, Ph.D., 1967, University of Colorado: Radiotracer synthesis with positron emitters.

Grine, Fred, Ph.D., 1984, University of the Witwatersrand, Johannesburg, South Africa: Tooth enamel thickness and structure and the stresses experienced by tooth enamel during masticatory loading in primates.

Harrington, Donald, M.D., 1966, Marquette University: Real-time medical image retrieval systems.

Hsiao, Benjamin, Ph.D., 1987, Institute of Materials Science at University of Connecticut: Structural and morphological development of complex polymer systems during preparation and processing in real time.

Hurst, Lawrence C., M.D., 1973, University of Vermont: Etiology of carpal tunnel syndrome; etiology of Dupuytren's contracture.

Jacobsen, Chris, Ph.D., 1988, Stony Brook University: X-ray microscopy and holography.

Jesty, Jolyon, Ph.D., 1975, Yale University: Control mechanisms of coagulation, experimental and theoretical analyses.

Kaufman, Arie E., Ph.D., 1977, Ben-Gurion University: Computer graphics; visualization; interactive systems; 3-D virtual colonoscopy; computer architecture.

Krukenkamp, Irwin B., M.D., 1982, University of Maryland: Systolic and diastolic mechanics and myocardial oxygen consumption.

Liang, Jerome, Ph.D., 1987, City University of New York: Development of medical imaging hardware for single photon detection.

Mathias, Richard, Ph.D., 1975, UCLA: Research in biophysics seeks physical insights into how cells and tissues function.

Moore, Leon, Ph.D., 1976, University of Southern California: Renal physiology.

Rafailovich, Miriam, Ph.D., 1980, Stony Brook University: Polymeric liquids; phase transitions; thin film wetting phenomena; biopolymers.

Reichek, Nathaniel, M.D., 1965, Columbia University: Cardiac Magnetic Resonance Imaging; myocardial mechanics, perfusion, viability.

Reinstein, Lawrence E., Ph.D., 1974, Boston University: Neutron capture therapy; electronic portal imaging devices.

Rubin, Clinton, T., *Director*, Ph.D., 1983, Bristol University: Tissue adaptation; biophysical treatment of musculoskeletal disorders.

Stein, Lincoln, Ph.D., 1989, Harvard University: Genome informatics; developing databases, data-analysis tools, and user interfaces to organize, manage, and visualize that vast body of information.

Associate Professors

Bluestein, Daniel, Ph.D., 1992, Tel Aviv University, Israel: Dynamics of fluid flow and cellular transport through vessels.

Button, Terry, Ph.D., 1989, University at Buffalo: High-resolution computer-aided tomography.

Chon, Ki, Ph.D., 1993, USC Los Angeles: Signal processing; development of novel algorithms to understand dynamic processes.

Dilmanian, F. Avraham, Ph.D., 1980, Massachusetts Institute of Technology: Computed tomography; radiation therapy.

Frame, Molly, Ph.D., 1990, University of Missouri: Microvascular flow control at the fluid dynamic and molecular levels.

Gindi, Gene, Ph.D., 1982, University of Arizona: Algorithm development for medical imaging.

Hadjiargyrou, Michael, Ph.D., 1992, City University of New York: Molecular mechanisms of bone development and regeneration.

Khalsa, Partap, D.C., Ph.D., 1995, University of Massachusetts and Worcester Polytechnic Institute: Spine biomechanics; back pain; mechanoreceptor and nociceptor encoding of mechanical states.

McCombie, Richard, Ph.D., 1982, University of Michigan: Structure and function in complex genomes.

Pan, Yingtian, Ph.D., 1992, National Laser Technology Laboratories, China: Optical/NIR spectroscopy and imaging methods and applying these techniques to provide clinical diagnostic information.

Qin, Yi-Xian, Ph.D., 1997, Stony Brook University: Physical mechanisms involved in the control of tissue growth, healing, and homeostasis, especially bone adaptation influenced by mechanical environment.

Rastegar, Jahangir, Ph.D., 1976, Stanford University: Robotics; biomechanics.

Reinitz, John, Ph.D., 1988, Yale University: Generation of body form, specifically the determination of morphogenetic fields.

Skiena, Steven, Ph.D., 1988, University of Illinois: Computational geometry; biologic algorithms.

Solomon, Irene, Ph.D., 1994, University of California at Davis: Reflex and central neural control of cardiovascular and respiratory function.

Stein, Lincoln, M.D., Ph.D., 1989, Harvard Medical School and University: Proactive approach to the genome information explosion by developing databases, data-analysis tools, and user interfaces to organize, manage, and visualize that vast body of information.

Zhang, Michael, Ph.D., 1987, Rutgers University: Identifying functional elements in eukaryotic genomes using mathematical and statistical methods.

Assistant Professors

Anderson, Janet, Ph.D., 1989, Stony Brook University: The study of factors that are induced directly by double-stranded RNA and that are independent of the interferon response; novel mechanism(s) by which these factors promote apoptosis independent of the tumor suppressor gene p53.

Chen, William, Ph.D., 1993, University of Michigan: Controlled release biodegradable DNA delivery vehicles for gene therapy; innovative drug delivery systems

Dhundale, Anil, Ph.D., 1987, Stony Brook University: cDNA microarrays, functional genomics technologies; translational research.

Enteheva, Emilia, Ph.D., 1998, University of Memphis: Cardiac bioelectricity; electrical stimulation of cardiac tissue; mechanisms of cardiac arrhythmias; defibrillation and modulation of cell function through gene transfer.

Goldstein, Rita, Ph.D., 1999, University of Miami: Multidisciplinary approach to measure brain function such as functional (fMRI), (PET), (ERP) recordings, and neuropsychology.

Judex, Stefan, Ph.D., 1999, University of Calgary, Canada: Molecular bioengineering; mechanical, molecular, and genetic influences on the adaptation of bone and connective tissues to physiologic stimuli.

Miura, Michiko, Ph.D., 1984, University of California, Davis: Drug delivery methods; developing new boron-carriers for BNCT.

Mueller, Klaus, Ph.D., 1998, Ohio State University: Computer graphics, data visualization, medical imaging.

Mujica-Parodi, Lilianne, Ph.D., 1998, Columbia University: Relationships between four simultaneously or near-simultaneously interacting systems: neural, cardiac, endocrine, and cognitive, to better understand the neurobiology of arousal, fear, and stress.

Neuwald, Andrew, Ph.D., 1987, University of Iowa: Statistical and algorithmic methods with their application to the classification and modeling of protein domains.

Rizzo, Robert, Ph.D., 2001, Yale University: Application of computational techniques to drug discovery.

Rooney, William, Ph.D., 1990, Stony Brook University: The development and application of magnetic resonance techniques for the measurement of tissue physiology and chemistry.

Schlyer, David, Ph.D., 1976, University of California, San Diego: Cyclotron targetry development; nuclear cross-section measurement; biomedical imaging technology.

Shorr, Robert, D.I.C., Ph.D., 1982, University of London Imperial College of Science and Technology, England: Commercial development of biotechnology ventures.

Wagshul, Mark, Ph.D., 1992, Harvard University: Utilizing MRI techniques for better understanding, diagnosing, and treating disease.

Wong, Stanislaus, Ph.D., 1999, Harvard University: Study of intermolecular interactions at the nanometer scale, critical in understanding problems such as friction and lubrication at macroscopic length scales, binding energies on surfaces essential for the design of effective catalysts, as well as phenomena such as chemical and biological self-assembly.

Zhao, Wei, Ph.D., 1997, University of Toronto, Canada: Development of novel detector concept and new clinical applications for early detection of cancer.

Zhong, Zhong, Ph.D., 1996, Stony Brook University: Medical imaging and diagnosis using monochromatic X-rays, X-ray phase contrast, and X-ray optics.

Zhu, Wei, Ph.D., 1996, University of California, Los Angeles: Brain image analysis; design and analysis of clinical trials and other biomedical studies; and genetics modeling.

Research Faculty

Ding, Yu-Shin, Ph.D., 1987, Stony Brook University: Investigation of biochemical transformations and drug mechanisms in primates and humans.

- Gatley, John, Ph.D., 1975, University of Newcastle-upon-Tyne, England: Medical radionuclide imaging.
- Goldfarb, James, Ph.D., 2000, Catholic University of Nijmegen: Application of magnetic resonance imaging (MRI) to the cardiovascular system, particularly in the areas of myocardial function and blood vessels.
- Hainfeld, James, Ph.D., University of Texas-Austin: Development of organometallic cluster compounds to be used as high resolution molecular labels.
- Kolsky, Kathryn, Ph.D., 1989, Carnegie Mellon University: Development and production of radioisotopes using the BLIP facility, a high-energy charged particle accelerator.
- Miller, Lisa, Ph.D., 1995, Albert Einstein College of Medicine: Chemical makeup of tissue in disease using high-resolution infrared and x-ray imaging.
- Reinitz, John, Ph.D., 1988, Yale University: Fundamental problems in gene regulation and development, large scale optimization, and bioinformatics.
- Thanos, Peter, Ph.D.: Gene therapy and dopaminergic mechanisms of alcohol and drug abuse.
- Vaska, Paul, Ph.D., 1997, Stony Brook University: Instrumentation for positron emission tomography (PET).
- Vazquez, Marcelo, M.D., Ph.D., 1990, National University of La Plata, Argentina: Study of the mechanisms of central nervous system (CNS) damage induced by space radiation using in vitro (neural stem cells and neurons) and in vivo models.
- Volkow, Nora, *Director of Nuclear Medicine, Brookhaven National Laboratory*. M.D., 1981, National University of Mexico, UNAM: Positron emission tomography; substance abuse; aging.
- Wang, Yi, ScD., 1999, Washington University St. Louis: Noninvasive in vivo cardiovascular imaging for the heart functional and morphological assessment using magnetic resonance imaging and image processing techniques.

Degree Requirements

Requirements for the M.S. Degree

A minimum of 31 graduate credits are required to earn the Master of Science in BME (non-thesis option) or 37 credits for the M.S. degree (thesis option). The program study can be chosen from any of the following approved tracks/specializations: General, Biomechanics, Biosignals, Medical Physics, or Molecular Bioengineering. The General program of study can be custom tailored in consultation with a student's faculty advisor/mentor to accommodate almost any BME area of interest. The following courses must be taken by all first-year graduate students: BME 501 Engineering

Principles in Cell, Tissue, and Organ Systems; BME 502 Advanced Numerical and Computation Analysis to Biological Systems; BME 505 Principles and Practice of BME; BME 520 Laboratory Rotation I; and BME 521 Laboratory Rotation II. All students (except those pursuing the Medical Physics Track) must also fulfill a business/management course requirement, which can be met by taking: BME 507 Fundamentals of BME Management, BME 509 Fundamentals of the Bioscience Industry, or six credits of approved graduate courses from the School of Business. A given track/specialization will have additional requirements, which includes a minimum of six technical elective courses.

Thesis or Non-Thesis Options

The student has the option of earning the Master of Science Degree in BME on either a thesis or non-thesis track. If non-thesis, the student undertakes elective graduate coursework to complete the 31 credits. In the thesis option, the student must additionally complete six credits of BME 599 Thesis Research and submit and defend a written thesis. A grade point average of B or better must be attained for the core BME courses taken, and an overall grade point average of 3.0 out of 4.0 must be maintained. For the non-thesis option, most students can complete this program within three academic semesters, and most students complete the thesis option in four academic semesters. The non-thesis option is recommended for students who wish to pursue a career in industry that does not involve Research and Development (R&D). Students pursuing the non-thesis option cannot use BME 599 to fulfill any requirements (i.e., it is not a technical elective nor core course). The thesis option is recommended for students who will be continuing on for their doctoral degree and for students who wish to pursue an industrial career with an R&D focus. All BME students must also take GRD 500.

Requirements for the Ph.D. Degree

A. Completion of the M.S. degree in Biomedical Engineering or equivalent graduate program

B. Satisfactory completion of the BME qualifying exam

C. Plan of Study

Students matriculating into the doctoral (Ph.D.) degree program must complete

all the requirements for the M.S. degree in BME at Stony Brook or enter the program with a relevant M.S. degree. This latter option is termed admission with "Advanced Standing." After completion of the M.S. degree or admission with Advanced Standing, there are no course requirements per se, though certain courses may be required to fill any gaps in the student's knowledge. Following completion of a qualifying exam, an independent basic research program will be undertaken. Subsequently, the student will present and defend his or her dissertation proposal. Successful completion of this stage will enable the student to "Advance to Candidacy." One semester of teaching practicum must be satisfactorily performed. Completion of the research program will culminate in the submission and oral defense of a doctoral dissertation. The University requires at least two consecutive semesters of full-time graduate study.

D. Teaching Requirements

The BME teaching requirement for the Ph.D. degree can be fulfilled in any of the following three manners:

1. Deliver four lectures in a BME undergraduate or graduate course and present a seminar that covers the state-of-the-art in your field of research.
2. Teach a BME course, either as the instructor of record (if you have G5 student status) or as the principal instructor (for G4 student status).
3. Petition for something else that is equivalent to the above.

E. Thesis Proposal Examination

After successful completion of the qualifying examination, the student selects a thesis advisor and writes a proposal for thesis research. After approval by the thesis advisor, the proposal is orally defended before a thesis committee.

F. Advancement to Candidacy

After successful completion of all required and elective courses, the qualifying examination, and the thesis proposal examination, the student will be recommended to the Graduate School for advancement to candidacy.

G. Dissertation

The research for the Ph.D. dissertation is conducted under the supervision of the thesis committee. The dissertation must represent a significant contribution to the

scientific and/or engineering literature. Upon approval of the completed dissertation by the thesis committee, a formal public oral defense of the dissertation is scheduled at which the student presents his or her findings and is questioned by members of the examining committee and by other members of the audience. On acceptance of the dissertation by the thesis committee, all requirements for the degree will have been satisfied.

H. Time Limit/Residency Requirements

All requirements for the Ph.D. degree must be completed within seven years after completing 24 credits of graduate study. The University requires at least two consecutive semesters of full-time graduate study.

Courses

The goal of the Program in Biomedical Engineering is to promote actively the development of a versatile engineering graduate. This requires that the engineering student understand biological concepts as well as engineering concepts outside of his or her defined major. The core set of biomedical engineering courses will expose the biomedical engineering student to the principles of cell, tissue, and organ biology, as well as ensure that the students attain a credible level of sophistication in the engineering and basic science concepts that lie outside of their major, and which traverse multiple areas of biomedical engineering.

BME 501 Engineering Principles in Cell, Tissue, and Organ Systems

Course content is directed toward describing the microscopic physical interactions between cells and their environment as electro-mechano-chemical processes occurring at surfaces. This is provided in the context of basic molecular biology and cell physiology concepts. Emphasis is placed on developing of the critical role of non-linear dynamics, physical chemistry of adsorption and desorption processes, self assembly in cellular automata, and how complexity arises within simple physical systems.
Fall, 3 credits, ABCF grading
May be repeated twice for credit

BME 502 Advanced Numerical and Computation Analysis Applied to Biological Systems

Numerical analyses of biological data. A unified mathematical/time series framework for modeling and mining biological data. Applications range from cardio-respiratory, renal blood pressure/flow and sequence (DNA, RNA, proteins) to gene expression data. Tools of data analysis include linear algebra, interpolation and extrapolation, parametric and nonparametric spectral estimation with the FFT and singular value

decomposition, statistical description of data and integration of ordinary differential equations. Special focus will be placed on the use of linear and nonlinear numerical methods for the identification of physiological system dynamics and the development of computer simulation techniques to study dynamic response of physiological systems.

Spring, 3 credits, ABCF grading
May be repeated twice for credit

BME 503 Cell and Molecular Imaging

This course will cover basics of optics, microscopy, spectroscopy and fluorescence in the context of imaging at the cellular and molecular level. Recently developed advanced imaging techniques for probing protein interactions and live cell functions are also discussed. The course is organized in 3 modules:

1. Optics and Spectroscopy (e.g., Properties of light, polarization, diffraction, spectra)
2. Fundamentals of Fluorescence and Applications to Molecular and Cellular Measurements (e.g., Jablonsky diagram, Stokes' shift, emission, excitation spectra, fluorescence anisotropy)
3. Signal Processing, Image Analysis Techniques and Scientific Visualization (e.g., temporal and spatial filters, 1D and 2D Fast Fourier transform, spectral analysis, cross-correlation).

Theory will be complemented by extensive use of Matlab and its Image Processing Toolbox.

Fall, 3 credits, ABCF grading

BME 504 Biomaterials Science and Analysis

Course content is directed toward providing an introductory treatment of the engineering issues implicit in understanding living tissue interactions with processed materials. Emphasis on identifying and eliminating surface contamination, corrosion, and optimizing material surface properties and compatibility.

Spring, 3 credits, ABCF grading

BME 505 Principles and Practice of Biomedical Engineering

Introduces first-year students to the basic and clinical research at the cutting edge of biomedical engineering. The course has two key components: the first is a seminar series presented by internationally renowned bioengineers. An interactive discussion of topic-specific scientific literature precedes the formal presentation. The second component of the course is teaming up with a physician, in rounds, the operating theater, clinics, etc., to get exposure to the real-life problems that face the medical community. It is hoped that the mix of science and clinic will move students toward determining how they can make contributions to health and society.

2 credits, ABCF grading

BME 506 Principles and Practice of BME

The goal of this course is to expose students to the cutting edge of biomedical engineering, including the clinical challenges that arise in this discipline. The course has two key components: the first is a seminar series presented by internationally renowned bioengineers, including Stony Brook faculty, which cover areas such as biomechanics, medical imaging, biomaterials, tissue engineering, drug/medical device development, bioinformatics and functional genomics. Topics related to the

impact of technology on medicine are also addressed, including ethics. An interactive discussion of topic-specific scientific literature precedes the formal presentation. The second component of the course is teaming up with a physician, in rounds, the operating theatre, clinics, etc., to get exposure to the real-life problems which face the medical community. It is hoped that the mix of science and clinic will move students toward determining how they can make contributions to health and society. Required course for BME M.S. and Ph.D. students.

Fall and spring, 1 credit, ABCF grading

BME 507 Fundamentals of Biomedical Engineering Management

This course exposes the engineering student to the responsibilities that focus on the management issues in biomedical engineering. Management functions are explored and the students learn how to integrate these functions with engineering responsibilities.

Fall, 3 credits, ABCF grading

BME 508 Molecular and Cellular Biomechanics

Course content revolves around the effects and interactions of mechanical forces at the cellular and molecular level. The topics will range from describing the molecular and cellular basis of the adaptation of tissues to physical signals, to prescribing specific mechanical environments for improved tissue engineering, to delineating relevant molecular, cellular, and biomechanical techniques, all the way to issues involved in the development and approval of diagnostics and therapeutics in molecular engineering. For a deeper understanding of the course material as well as to allow students to apply their newly gained knowledge, this course will contain a module on the design and analysis of experiments (i.e., applied biostatistics) and incorporate practical exercises in both laboratory (e.g., a real time PCR experiment) or simulated computer settings (e.g., modeling of cell behavior).

Fall and spring, 3 credits, ABCF grading

May be repeated twice for credit

BME 509 Fundamentals of the Bioscience Industry

A four-module course set up to provide students with a comprehensive introduction to the complexities of the bioscience business environment.

Spring, 3 credits, ABCF grading

May be repeated twice for credit

BME 517 Radiation Physics

This graduate offering provides an initial physical background required for the study of the Medical Physics. Sources of ionizing radiation including radioactivity (natural and manmade) and x-ray producing devices are studied as well as sources of nonionizing radiation such as radiofrequency and ultrasound. The physical aspects of these radiations are characterized by their interaction with matter and methods for their detection. Each student will select and present a proposal for solving a clinical medical physics problem.

Fall, 3 credits, ABCF grading

May be repeated once for credit

BME 518 Radiobiology

The biological consequences of irradiation (ionizing, ultrasound, laser, RF, etc.) will be examined. Interaction mechanisms will first be examined followed by examination of the radiation impact at the molecular and cellular level. The use of radiation for therapeutic gain will be considered. As well, models will be developed for risk estimates. Topics to be covered will include target theory, biological response, NSD, and risk estimates.

*Spring, 3 credits, ABCF grading
May be repeated once for credit*

BME 519 Medical Health Physics

This course discusses the health physics and safety issues associated with radiological devices, facilities, and procedures.

*Spring, 3 credits, ABCF grading
May be repeated twice for credit*

BME 520 Lab Rotation I**BME 521 Lab Rotation II****BME 525 Tissue Engineering**

Course deals with basics of biomaterial formulation that are relevant to tissue engineering, leading to the principles and practice of designing an engineered tissue, which will be facilitated by a design project.

*Spring, 3 credits, ABCF grading
May be repeated twice for credit*

BME 526 Biological Systems Engineering

This course is a hands-on study of systems engineering in biology, using computer modeling to conceptualize and simulate a wide variety of applications. Computer wizardry not required; all skills taught in class. Appropriate and applicable to all BME tracks.

*Fall, 3 credits, ABCF grading
May be repeated twice for credit*

BME 530 Medical Image Formation

This course covers the physical aspects of medical image formation. Image receptor design/optimization, reconstruction techniques, device hardware and performance characteristics are considered.

*Fall, 3 credits, ABCF grading
May be repeated twice for credit*

BME 531 Biosensing and Bioimaging

Basic concepts of biosensing and bioimaging, which include the elements of biological systems and bioimmobilizers, traditional electrode and novel optical transducers, and advanced biomedical optical imaging systems.

*Fall, 3 credits, ABCF grading
May be repeated twice for credit*

BME 532 Time Series Modeling of Biological Systems

A unified mathematical/time series framework for modeling and mining biological data. Applications range from cardio-respiratory, renal blood pressure/flow and sequence (DNA, RNA, proteins) to gene expression data. Tools of data analysis include neural networks, time-invariant and time-varying spectral methods, fractal and nonlinear dynamics techniques, hidden markov model, clustering analysis, and various system identification techniques.

Spring, 3 credits, ABCF grading

BME 534 Functional Genomics

Course provides foundation in concepts of functional genomics and proteomics. Topics include organization and complexity of the mammalian genome and mechanisms of expression of genes, gene expression analysis technologies with a strong focus on construction and utilization of DNA microarrays, and tools for determining gene function by perturbation of gene expression.

*Spring, 3 credits, ABCF grading
May be repeated twice for credit*

BME 540 Radiation Oncology Physics

This course provides a background in therapeutic instrumentation, dosimetry, and treatment planning.

*Fall, 3 credits, ABCF grading
May be repeated twice for credit*

BME 545 Cellular Physiology and Biophysics

Cellular structure and function. Topics include ion channels excitability, transport, energetics and metabolism, contraction, secretion, and communication within and between cells. Emphasizes quantitative analysis of cellular processes. Course includes a laboratory with demonstrations and discussions of current issues in cellular physiology and biophysics. Crosslisted with HBY 530.

Fall, every year, 4 credits, ABCF grading

BME 546 Statistical Analysis of Physiological Data

Statistical methods useful in analyzing common types of physiological data. Topics include probability, data distributions, hypothesis testing, with parametric and non-parametric methods, ANOVA, regression and correlation and power analysis. Emphasis is on experimental design and appropriate, efficient use of statistical software.

*Permission is required
1 credit, ABCF grading*

BME 547 Model-Based Analysis of Physiological Data

The analysis of common biochemical and physiological data by non-linear regression of data models and biophysical models of physiological and biochemical processes. Examples include binding kinetics, compartmental mass transfer and spectral analysis.

*Permission is required
1 credit, ABCF grading*

BME 548 Measurement and Analysis in Physiological Research

The acquisition and analysis of data arising from common biochemical and physiological measurements. Topics include computer-based data acquisition and processing, densitometry, microscopy, and image analysis and processing. Emphasis is on experimental design and strategies for optimizing signal to noise ratio of measurements.

1 credit, ABCF grading

BME 549 Experimental Techniques in Systems Physiology

A series of lectures and laboratory exercises designed to introduce students to invitro experimental techniques used in systems physiology. Emphasis will be placed on the ethical use of rodents in biomedical research and the measurement of physiological variables. Data

acquisition and analysis procedures used in cardio-vascular, respiratory, neural and renal physiology will also be covered.

*Permission is required
1 credit, ABCF grading*

BME 550 Mathematical Models of Physiologic and Biophysical Systems

An introduction to mathematical modeling of cell and tissue function. Topics include the derivation and numerical solution of models of cell homeostasis, membrane transport and excitability, and cell signaling and metabolism. Grading is based on problems, student presentation, and completion of a modeling project.

*Permission is required
3 credits, ABCF grading*

BME 571 Microfluids in Biological Systems

This course will outline theory and applications of special fluid handling conditions associated with living systems.

*Fall, 3 credits, ABCF grading
May be repeated twice for credit*

BME 572 Biomolecular Analysis

This interdisciplinary course is intended for graduate students and advanced undergraduates in departments such as Biomedical Engineering, Chemistry, Physics, Biology and Chemical Engineering. This course will give an introduction to single molecule experiments using fluorescence, optical traps, AFM cantilevers, microneedles, magnetic microbeads as well as micro and nanofluidic devices.

*Prerequisite: Permission of instructor
Fall, 3 credits, ABCF grading
May be repeated twice for credit*

BME 599 Biomedical Engineering Research

Research to be supported by a faculty member of the Department of Biomedical Engineering. Students must have permission of instructor and enroll in appropriate section. Faculty to be identified by the student.

*Prerequisite: Permission of instructor
Fall and spring, 1-9 credits, S/U grading
May be repeated for credit*

BME 601 Cardiovascular Fluid Mechanics

The course will cover the application of fluid mechanics principles to the analysis of blood flow in the cardiovascular system under normal and pathological conditions. It will follow an historical time line by beginning with the most basic models of arterial blood flow, and proceed to the most advanced theories related to physiology and pathology flow phenomena, including an examination of the most up to date research in the area and the development of devices and implants.

Spring, alternate years, 3 credits, ABCF grading

BME 602 Topics in Biomedical Applications of Neural Networks

This is a project-based course that includes weekly seminars discussing advanced topics in fuzzy logic and neural networks and their applications, in biomedical devices. Applications include drug delivery, diagnostics, management information handling. Students utilize simulation software to develop algorithms to deal successfully with training data sets of their own choosing.

Fall, alternate years, 3 credits, ABCF grading

BME 604 Finite Element Modeling in Biology and Medicine

Both finite difference and FEM are applied to solve the equations of incompressible and compressible fluid flow in porous media with emphasis on flows in skeletal tissues, i.e., bone and cartilage. Steady-state, transient flow, permeability and surface boundary conditions are discussed. Practical and recent studies in the field are also discussed. Programming using FORTRAN or C languages will be required. The student is also introduced to commercially available software packages.

Spring, alternate years, 3 credits, ABCF grading

BME 605 Biomechanics of Tactile Sensory Systems

Detailed study of the biomechanics of tactile neurophysiology for engineers entering the field of haptics and robotics manipulations. Anatomy and electrophysiology of transducer cells and neurons starting at the fingertips and extending to the somatosensory cortex. Characteristics of the external stimulus and its peripheral transmission. Relations of these topics to perceptual and/or behavioral responses.

Spring, alternate years, 3 credits, ABCF grading

BME 606 Drug Gene Delivery

Applications of biodegradable and biocompatible polymers in the design of drug and gene delivery systems for site-specific applications. A broad overview on the origin and development of controlled release therapeutic devices will be provided. Existing and proven commercial products will be examined. The second half of the course will be devoted to the use of DNA as a therapeutic entity and issues relevant to DNA delivery will be explored. An assessment of the most up-to-date DNA delivery technologies will be presented. Students are required to write a term paper on a drug or gene delivery topics of their choice. Students are also expected to give presentations on drug delivery and gene therapy related topics during the course.

*Fall, alternate years, 3 credits, ABCF grading
May be repeated for credit*

BME 610 Magnetic Resonance

This course provides a comprehensive study of magnetic resonance and its applications in medical imaging. An introduction of NMR is followed with development of the hardware and processing aspects required for MR image formation. An overview of basic and advanced MR imaging techniques is provided. Each student will select a topic in MR imaging for presentation at the conclusion of the course.

*Fall, 3 credits, ABCF grading
May be repeated for credit*

BME 612 Biomedical Engineering Aspects for the Use of Radiation in Medicine

This course provides a comprehensive study of the use of radiation in medicine. Physical aspects of the interaction of radiation with matter and for the radiation production are initially considered. The underlying principles of current radiation based medical imaging is considered next. Topics include radiography, fluoroscopy, radionuclide imaging and com-

puted tomography. The use of radiation for the treatment of malignancy is considered with the focus on required technology. Finally advanced applications of radiation are considered with focus on imaging and treatment. Each student will select a topic examining the engineering or technical application of radiation in medicine for presentation at the conclusion of the course.

Spring, 3 credits, ABCF grading

BME 615 Clinical Nuclear Imaging

This course is designed to prepare the Medical Physics graduate student in the area of clinical Medical Imaging. In this clinical rotation, medical physics methods for: planar film, DR, CR, mamography, fluoroscopy, CT, ultrasound and MRI performance evaluations will be introduced. In addition, basic medical ethics, radiographic anatomy and radiation safety will be covered. A total of 200 clinical hours will be completed in this program.

*Fall, every year, 4 credits, S/U grading
May be repeated twice for credit*

BME 616 Clinical Nuclear Medicine Imaging

This course is designed to prepare the Medical Physics graduate student in the area of clinical Nuclear Medicine Imaging. In this clinical rotation, the students will be exposed to radionuclide processes, radiopharmaceuticals including radioactive gases and aerosols-prepartio, characteristics and radiation dosimetry, in vitro and in vivo radiation detection systems, imaging systems and their performance evaluations. In addition, basic medical ethics, clinical interpretations and radiation safety will be covered. A total of 150 clinical hours will be completed in this program.

*Fall, every year, 4 credits, S/U grading
May be repeated twice for credit*

BME 617 Clinical Radiation Oncology Physics

This course is designed to prepare the Medical Physics graduate student in the area of clinical radiation oncology physics. In this clinical rotation, the student will learn by observation and participation some of a selection of the following medical physics procedures: LINAC Beam Dosimetry (ion chamber measurement techniques, film dosimetry (radiographic and radiochromic), diode dosimetry, TLD dosimetry, water phantom scanning), implementation of photon and electron beam calibration protocols (AAPM TG51), LINAC beam data measurement and tabulation, commissioning a TPS system, LINAC, acceptance testing, LINAC monthly QA, HDR QA and planning, and IMRT inverse planning and IMRT clinical QA. A total of 120 clinical hours will be completed in this program.

*Prerequisite: BME 517 and BME 540 with a B+ or better
Spring, every year, 4 credits, S/U grading*

BME 690 Biomedical Engineering Research

Biomedical Engineering research for doctoral students who have already received their M.S. degree, but have not yet advanced to candidacy.

*Fall and spring, 1-9 credits, ABCF grading
May be repeated for credit*

BME 698 Practicum in Teaching

Undergraduate teaching to be supervised by a faculty member of the Program in Biomedical Engineering. Course to be identified by the student and graduate studies director.

*Fall and spring, 1-3 credits, S/U grading
May be repeated for credit*

BME 699 Dissertation Research on Campus

Prerequisite: Students must be advanced to candidacy (G5); permission of instructor and enroll in appropriate section; major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab

*Fall, spring, and summer, 1-9 credits, ABCF grading
May be repeated for credit*

BME 700 Dissertation Research off Campus-Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

*Fall, spring, summer, 1-9 credits, S/U grading
May be repeated for credit*

BME 701 Dissertation Research off Campus-International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside of the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

*Fall, spring, summer, 1-9 credits, S/U grading
May be repeated for credit*

BME 800 BME Research

Full-time summer research.
*S/U grading
May be repeated*

College of Business (MBA)

Dean: William Turner, Harriman Hall 102 (631) 632-7171

Associate Deans: Manuel London, Harriman Hall 312A (631) 632-7159; Joseph McDonnell, Harriman Hall 307 (631) 632-8304

Graduate Program Director: T. Owen Carroll, Harriman Hall 102 (631) 632-7171

Director of the Center for Human Resource Management: Manuel London, Harriman Hall 102 (631) 632-7159

Office of Student Services: Harriman Hall 102 (631) 632-7171

Advanced Graduate Certificates awarded: Health Care Management, Information Systems Management, Human Resources Management, Finance
Degrees awarded: M.B.A., M.S. in Technology Management (in Korea)

In today's world of constant change and extraordinary opportunity, the need for business education has never been greater. Stony Brook is now able to offer something new in a university that already has achieved a great record of success as a premier research institution. The M.B.A. degree program is taught by senior Stony Brook faculty with decades of experience. They are complemented by key executives recruited as visiting professors from throughout the tri-state region—industry leaders who have built stellar careers in today's global business world.

Students participate in a vibrant learning environment where they gain the knowledge, skills, and insights necessary to manage complex organizations. Dedicated faculty have both academic and business experience, and teach not only the broad principles of management, finance, and marketing but also the more intangible aspects of leadership, communications, and business strategy.

The College of Business offers flexible full- and part-time programs with day, evening, and Saturday courses at the main campus in Stony Brook, Long Island, located 60 miles east of New York City. Some courses for the M.B.A. program are also offered at the Manhattan campus, situated at the crossroads of the business world at Park Avenue South and East 28th Street. Beyond these two locations, programs extend to the far corners of the globe as a result of relationships with business schools overseas.

Full-time students are encouraged to spend a summer session or a semester in the study abroad program to learn about business in China, India, Korea, Africa, Europe, or the Middle East. These experiences provide students with a competitive edge in the job market as businesses increasingly look for employees with overseas experience. Today most businesses are global in nature, whether they are multinational corporations or small local businesses with overseas suppliers, customers, or a diverse international workforce.

M.B.A. Program

By focusing on strategic, managerial, analytical, and technical processes and outcomes critical to success in a broad spectrum of industries, Stony Brook University's M.B.A. program helps students recognize ways in which they can add value to their firms and advance their careers.

Program Description

Stony Brook offers a flexible M.B.A. program:

Full-time M.B.A.

This 60-credit program is completed over a two-year period. Opportunities for internships and study abroad take place at one of our partner business schools in China, India, Europe, the Middle East, and Africa.

Part-time M.B.A.

Offering a flexible evening and Saturday course schedule to accommodate work schedules, this program can be completed between two and five years. We also offer convenient summer courses, weekday evenings, and Saturdays.

Fast Track M.B.A.

A 60-credit honors program for undergraduate students, this program permits students to take 30 graduate credits during their first four years at Stony Brook. In their fifth year, students go directly into the second year of the M.B.A. program for the final 30 credits of the M.B.A. Students have opportunities for a summer study abroad and an internship.

Accelerated M.B.A.

A 48-credit program for students with five years of business experience or advanced degrees beyond the bachelors.

Executive M.B.A.

This 48-hour-credit program is for mid-to-upper-level executives. Students are sponsored by their employers and can complete the program in as little as 24 months. The College of Business offers an E.M.B.A. for law firm managers at Stony Brook's Manhattan facility.

Core Courses

Core courses cover a broad range of topics in the first year, including finance, accounting, marketing, leadership, team building, communications, decision-making, economics, innovation, ethics, law, operations research, and organizational behavior. In the second year, students focus on an area of concentration such as information management, finance, marketing, human resources, health systems management, or general management. Students also engage in an industry project in the second year to get hands-on experience in applying the knowledge from the classroom to the business world. Finally, students take a capstone course in business strategy.

Concentrations

Students begin to take elective courses in the spring semester of the first year and take the majority of their courses as electives in the second year. Students may choose to concentrate in finance, marketing, information systems management, human resources, health systems management, or general management.

Superior Teaching in a Nurturing Learning Environment

The Stony Brook program prides itself on its superior teaching and its dedication to working with each student to develop his or her business and managerial skills. We seek to bridge the gap between theory and practice by selecting faculty members who can clearly communicate the practical benefits of managerial knowledge.

M.B.A. Curriculum

The M.B.A. curriculum for the 60-credit program is comprised of 18 three-credit courses plus a six-credit group project. The 18 courses include 11 required core courses plus seven electives. Four of the seven elective courses must be taken in a student's field of concentration, such as finance, management, information systems management, health systems management, human resources, or marketing. Full-time students typically

complete an internship or foreign study during the summer between the first two years.

Students within the M.B.A. program may also earn a New York State Advanced Graduate Certificate in Finance, Health Care Management, Human Resources, or Information Systems Management.

Two-Year Program

First Year

Fall Semester

MBA 501 Managerial Economics
MBA 503 Data Analysis and Decision Making
MBA 504 Financial Accounting
MBA 505 Marketing
MBA 502 Finance

Spring Semester

MBA 506 Leadership/Team Effectiveness/Communication
MBA 511 Technological Innovations
MBA 589 Operations Management
MBA 507 Ethics and Law
Elective

Summer

Study abroad/internship (usually completed in the summer)

Second Year

Fall Semester

MBA 592 Organizational Behavior
MBA 521/522 Industry Project (6 credits)
Elective
Elective

Spring Semester

MBA 512 Business Planning and Strategic Management (capstone course)
Elective
Elective
Elective
Elective

Typical Accelerated Curriculum (48 credits)

MBA 501 Managerial Economics
MBA 503 Data Analysis and Decision Making
MBA 504 Financial Accounting
MBA 505 Marketing
MBA 502 Finance
MBA 506 Leadership/Team Effectiveness/Communication
MBA 512 Business Planning and Strategic Management
MBA 511 Technological Innovations
MBA 589 Operations Management
MBA 507 Ethics and Law
MBA 521 Industry Project
MBA 592 Organizational Behavior
Elective

Elective
Elective
Elective

Admission to the M.B.A. Programs

The College of Business is designed for ambitious and able students who are capable of applying what they learn toward the solutions of organizational problems. Each student is asked to forward with the application a statement of career objectives and the way in which he or she expects to realize these objectives through the program.

Students must satisfy the following admissions requirements in addition to the minimum requirements of the Graduate School:

A. A bachelor's degree with a minimum grade point average of 3.0. In exceptional cases, students not meeting this requirement may be admitted on a conditional basis.

B. Aptitude for quantitative analysis, demonstrated through previous coursework, standardized tests, or practical experience. All applicants must have successfully completed an introductory calculus course (MAT 123 or equivalent) with a grade of C or higher.

C. Submission of Graduate Management Admission Test (GMAT) scores (preferred), or Graduate Record Examination (GRE) General Test scores.

D. Three letters of recommendation, one of which, if possible, should be from a professional working in a private company or public agency who is capable of evaluating the applicant's motivation and potential. The three letters of recommendation should also include at least one from a college faculty member, counselor, or administrator.

E. Acceptance by both the College of Business and the Graduate School.

F. \$60 application fee.

Although not required, examples of an applicant's creative work will be considered. These might include project reports or published articles.

Admission is available for both the fall and spring semesters. Applications for the fall semester should be submitted by April 15 and for the spring semester by October 1. Earlier submissions are encouraged, especially for candidates for universitywide fellowships. Applications are reviewed on a rolling basis, and if seats are available, applicants will be considered after the application deadlines. Late applications are accepted if

there are places available. Application forms may be obtained on the College of Business M.B.A. Web site www.stonybrook.edu/sbbusiness/mba.shtml or by writing to:

Office of Student Services
Harriman Hall, Room 102
College of Business
Stony Brook University
Stony Brook, New York
11794-3775

(631) 632-7171

E-mail: oss@notes.cc.sunysb.edu

Certificate Programs

The Advanced Graduate Certificate programs described below are open to M.B.A. students or other graduate students at Stony Brook. Students who meet the M.B.A. degree admissions requirements of the College of Business may also apply the certificate credits toward the M.B.A. degree. Students must declare their decision to matriculate into a master's program after the completion of no more than 12 credits. In addition, these programs are open to non-matriculated students who wish to earn an Advanced Graduate Certificate without completing an M.B.A. degree. Note that, although it is a valuable academic credential, an Advanced Graduate Certificate is not a degree.

Certificate Program in Human Resource Management

The Advanced Graduate Certificate in Human Resource Management is a program for private- and public-sector managers, labor relations specialists, and union representatives, human resources/personnel managers, and employee training professionals. The program, leading to the New York State Advanced Certificate in Human Resource Management, requires a bachelor's degree from an accredited college. This program is administered by the School of Professional Development. For more information and to apply, please refer to the following Web site: <http://ws.cc.sunysb.edu/spd/graduate/hrm.html>.

Certificate Program in Information Systems Management

The Advanced Graduate Certificate Program in Information Systems Management (ISM) is a graduate professional development program that provides an educational opportunity to combine management education with technical training in specific areas

related to information systems management. Directed toward career enhancement of new professionals, as well as toward advancement of experienced professionals, the program offers both a full-time and a part-time option. Certificate program students must complete the program within a three-year period. For more information and to apply, please refer to the following Web site: <http://ws.cc.sunysb.edu/spd/graduate/ism.html>.

Certificate Program in Health Care Management

The Advanced Graduate Certificate Program in Health Care Management is a professional development program intended for health practitioners who require management training and for managers who require specific training in the health care field. It offers participants a comprehensive understanding of health care and management and helps them develop the analytical capabilities to be effective managers. The Advanced Certificate Program in Health Care Management is a joint program of the School of Health Technology and Management and the College of Business.

The program is designed to meet the needs of working professionals who are part-time students and full-time graduate students at the University. Many courses are offered in the late afternoon or early evening. Certificate program students are required to complete the program within a three-year period. Graduate students who pursue either the Master of Science in Health Sciences in the School of Health Technology and Management or the M.B.A. in the College of Business may obtain the certificate as they earn credits toward graduation. For more information and to apply, please refer to the following Web site: <http://www.hsc.stonybrook.edu/html/programs/hcpm/hcpm.html>.

Certificate Program in Finance

The Graduate Certificate Program in Finance is a professional development program that emphasizes the managerial and technical issues in finance that are most important to professionals. The coursework will explore current financial thinking on corporate fiscal management, banking, capital markets, and firm and investor risk.

The curriculum consists of 18 credits (six three-credit courses). There are two

required courses, Finance and Financial Accounting, which reveal the foundations of finance and accounting needed to understand how corporate financial objectives are developed, measured, and reported. These courses are followed by a selection of any four finance elective courses, depending upon the student's specific areas of interest.

Elective courses explore the broad frontier of modern finance. Financial Management and Capital Markets deal with financial risks, banking and financial intermediation, corporate governance, and regulation. Investment Analysis presents techniques for evaluating investment alternatives to create optimal portfolios. Computational Finance exposes students to the computational rigors associated with modern finance theory. Managerial Accounting and Decision-Making presents the accounting system as a source of information for decision-making, planning control and evaluation. Cases in Finance explores challenging financial scenarios in a distinctive formal framework within which those problems can be discussed and addressed.

Research

Faculty members in the College of Business are strongly committed to teaching and fostering working relationships with students inside and outside the classroom, while maintaining their involvement in research.

In their research, Business professors examine complex issues and problems confronting today's managers and decision makers. They analyze businesses and other institutions as well as the economic, regulatory, and technological forces underlying decision-making processes and ongoing changes within these organizations. They keep close contact not only with other researchers in the United States and abroad, but also with regional, national, and international businesses by conducting applied research projects and working as consultants.

Students at the College of Business benefit from this high-caliber research in several ways. Faculty members often revise and develop new course materials to incorporate current research into their teaching and instruction. Exposing students to the latest knowledge and management skills best prepares them for future challenges and, at the same time, makes the classroom experience

dynamic and stimulating. Business students work closely with professors, and all students are invited to participate in seminars conducted by the school's researchers.

The school houses Centers for Human Resource Management, Health Services Research Management, Information Systems Management, and Small Business Development. Quality research conducted by the centers contributes significantly to the College's academic programs. In addition, the centers' applied and interdisciplinary research promotes valuable interactions with industry, government, and nonprofit organizations and provides hands-on experience to students.

Computing Services

The College of Business computing facility contains 20 networked personal computers that have high-speed connections to the outside world and a high-speed laser printer. Each computer has full Internet access to e-mail, Internet utilities, and Web servers and is equipped with the Microsoft Office suite of programs, plus software for statistical analysis, management science, expert systems, and other management applications. Via the network, students can access the campus IBM and VAX systems as well as the online library catalog. Students may access their own administrative records online, check course schedules for upcoming semesters, and view calendars for campus events.

Faculty

Dean

Turner, William H., M.B.A., 1966, New York University: Marketing; leadership; business strategy.

Professors

Laskowski, Richard, Ed.D., 1982, St. Johns University: Sports management; introduction to business.

London, Manuel, Associate Dean of the College of Business and Director of the Center for Human Resource Management. Ph.D., 1974, Ohio State University: Personnel promotion policies; management training; organizational behavior.

Sexton, Thomas R., Co-director of Health Services Research and Management Unit. Ph.D., 1979, Stony Brook University: Health care delivery systems; efficiency analysis; statistics.

Skorin-Kapov, Jadranka, Ph.D., 1987, University of British Columbia, Canada: Management information systems; operations research; artificial intelligence.

Wolf, Gerrit, Ph.D., 1967, Cornell University: Entrepreneurship; organizational behavior; human resources management; international management.

Research Professor

McDonnell, Joseph W., *Associate Dean of the College of Business*. Ph.D., 1978, University of Southern California: Management; corporate communications; crisis management; entrepreneurship.

Associate Professors

Carroll, T. Owen, Ph.D., 1968, Cornell University: Finance; management; information systems.

Casey, Jeff T., Ph.D., 1986, University of Wisconsin-Madison: Psychology/organizational behavior; negotiation and conflict resolution; human resource management; business strategy.

Weiner, Harry, *Associate Professor Emeritus*. S.M., 1970, Massachusetts Institute of Technology: Business-government relations; human resource management; managerial ethics.

Assistant Professor

Holod, Dmytro, Ph.D., 2005, University of Kentucky: Economics; banking and financial intermediation; financial markets and institutions; monetary policy; economic growth.

Lecturers

Allocca, Carl, *Director of Undergraduate Studies*. M.S.T., C.P.A., Long Island University: Public and private accounting; auditing; taxation; internal control, systems development.

Clark, Robert, M.S., Stony Brook University: Operations management; management science; entrepreneurship.

Ettl, Robert, M.B.A., Iona College; M.C.A., New York Institute of Technology; M.B.A., Penn State: Marketing; strategic planning; government relations; public relations.

Lekacos, Aristotle T., M.S., Polytechnic Institute of New York: Information systems; business strategic; entrepreneurship; innovation; simulations.

Lewis, Herbert F., Ph.D., Stony Brook University: Applied mathematics and statistics; operations research; management science; information systems; productivity and efficiency analysis.

Nugent, Michael, M.B.A., Dowling College: Financial engineering; derivatives; international finance; capital markets and institutions; foreign exchange markets; investment analysis; corporate finance; business strategy.

Palermo, Mark R., J.D., Hofstra University School of Law; M.B.A., Adelphi University: Finance; strategy; economics; law; general business.

Quey, Timothy M.: Management; marketing/product development; marketing of high technology; new product development; product design market research; entrepreneurship.

Adjunct Faculty

Aguayo, Rafael, M.B.A, Finance and International Business.

Andrade, Arturo, M.S., Management and Policy and Certificate in Information Systems.

Azzato, Lisa, J.D., Human Resource Management.

Brown, Tom, M.B.A., Accounting.

Cerbone, Frank, M.A., Information Systems Management.

Chodkowski, Matthew, Ed.D., Human Resource Management.

de Onis, Luis, M.S., Management and Policy and Certificate in Labor Management.

Diamonte, Thomas, Ph.D., Psychology.

Gatteau, Richard, Ph.D., Administration and Supervision.

Gomes, Carol, M.S., Management and Policy.

Gomes, Lyle, M.B.A., C.M.A., Accounting.

Heaton, William, M.B.A., Entrepreneurship.

Infantino, Anthony, M.B.A., Management.

Jefferson, Glenn, M.B.A.

Kerr, Brian, M.P.S., Industrial and Labor Relations.

Levanti, Gary, M.B.A., Marketing.

Liggan, William, M.P.S., Human Resource Management.

Marlow, Frank, Ed.D., Human Resource Management.

McFadden, Edward, M.A.

McKiernan, Kevin, M.B.A., Banking and Finance.

McMullan, Christine, M.P.A., C.W., Human Resource Management.

Menton, Arthur, M.M.E., Marketing.

Mone, Edward, M.A., Human Resource Management.

Palermo, Margot, M.B.A., Finance and International Business.

Persia, Viola, M.S., C.P.A., Accounting.

Revello, Douglas, M.B.A., Finance.

Rizzi, Timothy A., M.S., Information Systems Management.

Rossi, Paul, M.B.A., Accounting and Corporate Finance.

Rotchford, John, M.B.A., Information Systems Management.

Schiavone, Vincent, M.B.A., M.P.S., Human Resource Management.

Schmeltz, Martin, M.S., Taxation.

Sheehan, Donald, M.A., Liberal Studies.

Yung, Gracer, M.B.A., International Banking and Finance.

Degree Requirements

The M.B.A. curriculum prepares students for careers in management in business, government, and nonprofit organizations. The M.B.A. may be pursued either full- or part-time. Full-time students require two years of coursework with an internship in the summer between the two years. Part-time students may follow the same curriculum over a longer period, not to exceed five years. Admission is available in the fall and spring. Students in the five-year Stony Brook Fast Track program complete the first year of the M.B.A. after their junior year and prior to their fifth year at Stony Brook.

Internship Requirement

The College of Business internship program provides full-time students with important practical training in business management. The internship is a paid eight-to-twelve-week full-time summer position in a business, government, or nonprofit organization. Students must write a faculty-approved internship report in the semester following the internship. All students must enroll in MBA 599, Internship Practicum, for one credit in the term during which they are doing their internships.

Placement and Career Services

The Career Center provides a variety of career and life-planning services to M.B.A. students desiring assistance with their career development and job search. These services include career resource library materials, placement services including on-campus interviews, online resume referrals, job fairs, workshops on resume preparation and interviewing skills, and credential files.

Many companies visit the campus to conduct one-on-one interviews with M.B.A. students. It is suggested that graduate students contact the Career Center at the beginning of their first semester for more details.

Job/Internship Fairs are held regularly in which employers visit the campus to discuss their organizations and share available job openings. These fairs provide graduate students with unique opportunities to meet, have brief interviews, and leave resumes with a significant number and variety of employers. Continual expansion of the program is planned.

Online services, where resumes are forwarded by the Career Center to interested employers and where vacancies are posted, are provided by JOBTRAK (a link on the Center's home page). In addition, vacancy copies are posted on bulletin boards and kept in binders in the Center's library.

Career Resource Library

The Career Resource Library contains a wealth of information on a variety of topics related to the career planning process. Materials include information on occupations, labor market trends, salary levels, job hunting, resume writing, employment interviewing, and many other areas. Those M.B.A. students interested in pursuing doctoral study can look through directories, a CD-ROM collection of college and university bulletins, and information on entrance tests required. Detailed information on potential employers, including annual reports and related documents, is included in the "Organizational Literature" files. This library also has video tapes on specific companies and on various topics related to job search processes. You can visit the Center's Web page at www.sumysb.edu/career/.

Credential Service

Students and alumni wishing to collect letters of recommendation from faculty, past employers, and others, in one central location, may wish to establish a credentials file at the Career Center. These recommendations are available to be photocopied and sent directly to appropriate organizations, including prospective employers and admission offices of graduate and professional schools.

Workshops

For those who are about to begin the process of interviewing, writing a resume and/or searching for a job, group workshops are offered that provide information on these topics. Each workshop is two hours long and includes practical exercises as well as general theory. The "Resume Preparation" and "Interviewing Skills" workshops are offered on a weekly basis during the fall and spring semesters. Other workshops are scheduled less frequently and are noted on the Web pages and on the Career Center's student calendar publication.

Individual Counseling

Professional career counselors are available to assist with questions pertaining to any facet of the career decision-making process, from deciding on a specific business path to finding out how to effectively search for a job. Topics that are frequently discussed include selecting a specialization, researching companies, obtaining experience through volunteer and internship positions, job search strategy, marketing the value of a graduate degree, and establishing a credential file. Those interested in discussing these and other issues are encouraged to set up an appointment by calling or visiting the Career Center.

Courses

MBA 501 Management Economics

The techniques and approaches of micro-economic reasoning are applied to issues of management and policy. The theory of the market and the price system are closely examined to identify areas where neoclassical economics is helpful to the analyst and manager. Decisions regarding firm boundaries, competition, pricing, and entry are examined. Extensive use is made of case studies.

Fall, 3 credits, ABCF grading

MBA 502 Finance

How firms meet and manage their final objectives. Today's financial environment, the fundamental trade-off between risk and return, the time value of money, and valuing future cash flows are discussed. Financial tools and techniques, which can be used to help firms maximize value by improving decisions related to capital, are explained. Bond and stock valuations are introduced.

Fall, 3 credits, ABCF grading

MBA 503 Data Analysis and Decision Making

An introduction to statistical techniques useful in the analysis of management problems. We motivate each topic by managerial applications, and we analyze actual data sets using modern statistical software. Topics include probability estimation, hypothesis testing, and regression analysis.

3 credits, ABCF grading

MBA 504 Financial Accounting

Introduction and exploration of basic financial accounting terminology, principles, concepts, and their relevant business applications. This course will include the recording, summarization, and adjustment of financial transactions and the preparation and presentation of the basic financial statements. Other topics will include valuation methods for cash, accounts receivable, inventory and property, plant and equipment. This course is also offered as EMP 502.

3 credits, ABCF grading

MBA 505 Marketing

A survey course covering the foundations of the marketing discipline. The course is designed to give students conceptual frameworks and tools to help firms meet demands of the marketplace in a profitable way. A wide range of marketing strategy topics (e.g., segmentation, positioning) and marketing tactics (the Four P's of Marketing: Product, Price, Place, and Promotions) will be covered, as well as development of the discipline's foundations (definition, philosophy, and the history of marketing).

3 credits, ABCF grading

MBA 506 Leadership, Team Effectiveness and Communications

This course focuses on business leadership, teamwork, and communications. It seeks to answer the following three questions: What do leaders really do? What makes teams effective? How do you create persuasive communications? The course addresses such topics as leading organizational change, managing corporate crises, building motivated teams, and developing strategic communications. It examines these topics with a goal of not only imparting knowledge about these managerial practices but also assisting students to acquire the skills necessary to become business leaders, team builders and articulate communicators. We will seek to bridge theory and managerial practice by using case studies and inviting business executives to the class.

Spring, every year, 3 credits, ABCF grading

MBA 507 Ethics and Law

This course will link the main ethical problems facing the modern manager with the statutes and regulations that have been enacted to deal with these problems. Emphasis is placed on the moral and ethical responsibilities that relate to investors, employees, customers, and the community. Students will learn the basic vocabularies of business law and of ethics.

Spring, every year, 3 credits, ABCF grading

MBA 508 The Crisis of De-Industrialization

This course explores the economic, political, and ethical questions posed by the unprecedented rate of migration of American industry in recent years. The early migration of the textile industry to the decline of our smokestack industries is examined, followed by the new and enterprising responses of communities and unions to plant closure and migration, and the replacement of jobs by the growth of high-tech and service economies. It also covers the role of tax laws and government programs in inhibiting migration and assisting labor/community buyouts, and the new American dedication to sustaining industrial competitiveness.

Spring, 3 credits, ABCF grading

MBA 510 In Addition to Wages: Employee Benefits

This course addresses an area of major social change: new developments in fringe benefit programs available to American workers. Topics include pensions, social security, savings and profit sharing plans, and other benefits in the working and retirement years. It also compares fringe benefits available to the individuals in the private, public, and not-for-profit sectors. Future fringe benefit programs and policies will also be explored. This course is offered as both CES 510 and MBA 510.

*Prerequisite: CES 515/MBA 532
3 credits, ABCF grading*

MBA 511 Technological Innovations

Innovation drives the modern firm by the interaction of technical invention and managerial entrepreneurship. This course explores the variety of sources of new products, processes, and services, such as inventors, universities, research and development departments in industry, and government labs. In addition, the course explores the variety of ways of bringing new products, processes, and services to market, including startup firms, acquisitions, mergers, and entrepreneurship within the firm. Case studies showing the interaction of invention and entrepreneurship are analyzed. A term project is required in which the student either analyzes the history of invention and entrepreneurship in a major firm or writes a business plan for high technology startup firm. *Spring, every year, 3 credits, ABCF grading*

MBA 512 Business Planning and Strategic Management

The principles and techniques of strategic management by which an organization sets and implements its long-range direction. This includes the processes of environment scanning, self-assessment of organizational purpose and comparative advantage, and synthesis of organizational mission, plans, and strategic initiatives. Extensive use is made of case studies and in-class exercises. *Spring, every year, 3 credits, ABCF grading*

MBA 513 Human Relations in the Workplace

This course focuses on improving the quality of work life for employees, as a value in itself and as an incentive to greater productivity and reduced turnover. Students will explore: the importance of communication-orientation of new employees, formal and informal consultation, quality circles, billboards, news bulletins, etc., and exit interviews; providing opportunities for job enrichment and career development-career planning assistance, practitioner training, cross training, job rotation, job sharing and flextime, enriching each job as the employee progresses; employee assistance programs-financial planning, drug and alcohol rehabilitation, retirement planning, educational assistance, summer jobs for kids, etc.; recreational programs-athletic teams, holiday and seasonal celebrations, community service participation and contests. All of these activities contribute to developing the joint participation of employees and management which is the hallmark of the well-managed corporation. This course is offered as both CES 511 and MBA 513. *3 credits, ABCF grading*

MBA 514 Collective Bargaining and Arbitration in the Public Sector

This course presents an overview of the history, procedures, and problems of public sector labor relations, and comparisons with the private sector. The role of public opinion and politics in public sector bargaining will be explored. Students will role play the negotiation of a public sector contract: preparation of bargaining package, negotiation, mediation, fact-finding, arbitration. They will also prepare, present, and critique a public sector grievance case from its shop origins to its final

disposition by arbitration. This course is offered as both CES 514 and MBA 514.

*Prerequisite: CES 516/MBA 533
3 credits, ABCF grading*

MBA 515 Comparative and International Management

Because both the similarities and differences of organizations and management across national boundaries must be a part of the knowledge base of tomorrow's manager, this course examines proprietorships, partnerships, corporations, governmental regulatory agencies, public authorities, voluntary social services, multinational corporations, and strategic alliances, as well as combinations of these organizations, across sectoral and national boundaries.

Spring, 3 credits, ABCF grading

MBA 517 Information Systems for Management

Information systems and its role in strategic planning and managerial operations in business. The systems approach to the analysis, design, and implementation of information systems. Recent developments in information technology and its impact on existing and future information systems.

Fall, every year, 3 credits, ABCF grading

MBA 519 Grievance Handling and Arbitration

Grievance and arbitration procedures in a variety of private- and public-sector labor agreements are examined in terms of contract clauses, practical procedures, and problems characteristic of different employment sectors. Dispute settlement between parties themselves is explored, and the final recourse to arbitration is examined in terms of arbitrator selection, case preparation, presentations at hearings, and analysis of awards. This course is offered as both CES 519 and MBA 519.

*Prerequisite: CES 516/MBA 533
3 credits, ABCF grading*

MBA 520 From Bullets to Ballots: A History of Industrial Relations in America

The growth and development of labor unions from craft guilds in an agricultural society to present-day national and industrial organizations. The early struggles of workers to organize, the development of labor legislation, the evolution of unions as a major political force, and the advent of public-sector unions and their impact on workplace issues. The course examines the uncertain future of unions as the country moves from a production to a service-oriented economy.

3 credits, ABCF grading

MBA 521 Industry Project

Under faculty supervision, groups of students work for clients on management issues in a variety of areas such as health care, MIS, marketing, data analysis, business plans, and the like. The course provides students with the opportunity to apply the analytic skills they have learned in the classroom to actual management problems. Students also gain practical experience in business writing, giving formal presentations, and working in teams. The format for the course is a combination of work in the classroom and "lab" work. The lab work consists of visits with a

client, developing a formal proposal, generating a final report, and various other elements of a professional consulting arrangement.

Fall, every year, 6 credits, ABCF grading

MBA 522 Industry Project

Under faculty supervision, groups of students work for clients on management issues in a variety of areas such as health care, MIS, marketing, data analysis, business plans and the like. The course provides students with the opportunity to apply the analytic skills they have learned in the classroom to actual management problems. Students also gain practical experience in business writing, giving formal presentations, and working in teams. The format for this course is a combination of work in the classroom and "lab" work. The lab work consists of visits with a client, developing a formal proposal, generating a final report and various other elements of a professional consulting arrangement.

3 credits, ABCF grading

MBA 523 Human Resource Management Workshop

This course is designed for human resources practitioners who wish to prepare themselves for higher level executive positions: planning for the personnel function relative to organizational purpose and size of workforce; developing recruiting plans, job classifications, and wage schedules; establishing benefit systems; and training supervisors, systematizing employee supervision, and evaluation methods. Finally, the class will develop such motivational incentives as career development, job enrichment, and employee assistance programs and learn how to devise model affirmative action and employee safety procedures. This course is offered as both CES 523 and MGT 523.

3 credits, ABCF grading

MBA 524 Labor Negotiations Workshop

This is an advanced class in the negotiation of labor agreements in the private and public sectors. Through case studies and presentations students acquire an understanding of the attitudes and strategies of both negotiation parties, evaluation of the economic and political environments, gathering of essential information, determination of bargaining style and strategy, and role playing of negotiations using sample contracts. Guest lecturers critique class performance, offering suggestions for improving negotiation skills. This course is offered as both MBA 524 and CES 524.

*Prerequisite: MBA 533/CES 516
3 credits, ABCF grading*

MBA 525 Employment Law

This course will explore the legal interrelationships in selected areas among employers, employees, unions, and government. Topics will include the evolution of employee relations law, the practical implications of legislation, court decisions, and regulatory procedures governing labor/management relations in both the public and private sectors. This course is offered as both CES 525 and MGT 525.

*Prerequisite: CES 516/MGT 506
3 credits, ABCF grading*

MBA 526 Job Evaluation and Compensation Systems

An advanced course providing students with both theory and specific knowledge of job evaluation and compensation systems, including union issues, comparable worth and legal requirements: preparation of job analysis, descriptions, specifications and evaluations; theory of compensation systems as they relate to job satisfaction and employee morale; development of wage and salary surveys, internal and external equity pay scales, performance-based pay systems, and salary administration procedures. An analysis of incentives-bonuses, stock options, salary deferrals, and special benefits will complete the course. This course is offered as both CES 526 and MBA 526.

Prerequisite: CES 515/MBA 532
3 credits, ABCF grading

MBA 527 Women, Work, and Dollars

This course addresses the economic and social struggle of women to achieve workplace equality. It includes an examination of their labor force participation; the remuneration of women; segregated employment patterns; special problems of women in professional, managerial, and scientific disciplines; analysis of the corporate environment and the role of affirmative action in removing formal and informal barriers to progress. It investigates the campaign for comparable worth; alternative definitions of success; women's contribution to the world of work; the glass ceiling and the mommy track; work-family issues; child care; sexual harassment; and women as managers. The course will feature case analysis and guest speakers from different organizations. This course is offered as both CES 517 and MBA 527.

3 credits, ABCF grading

MBA 529 Managerial Accounting and Decision Making

This course covers cost accounting concepts and theories and the implementation of an accounting system as a source of information for decision making, planning, control, and the evaluation of organizational performance by management. Other topics include cost-volume-profit analysis, overhead rates, budgeting and statement of cash flows.

Prerequisite: MBA 504
3 credits, ABCF grading

MBA 530 Negotiation and Conflict Resolution

The methods and procedures for reaching negotiated agreements. Topics include reducing conflict and confrontation between contending parties, analysis of the techniques of win-lose and win-win negotiation, and mediation. Students are expected to participate in a series of workshop activities and simulated cases to reveal how negotiation and mediation are applied to resolving difficulties in business management, labor relations, international and domestic affairs, patient/doctor/hospital relations, and other areas where negotiation and mediation play a significant role in modern life. This course is also offered as CES 547.

3 credits, ABCF grading
May be repeated for credit

MBA 531 New Developments in Human Resource Administration

Introduction and exploration of basic financial accounting terminology, principles, concepts, and their relevant business applications. This course will include the recording, summarization and adjustment of financial transactions and the preparation and presentation of the basic financial statements. Other topics will include valuation methods for cash, accounts receivable, inventory and property, plant and equipment. This course is also offered as EMP 502.

Fall, 3 credits, ABCF grading

MBA 532 A Survey of Human Resource Administration

This is the mandated course in the human resource sector of the Human Resource Management curriculum. The course explores the basic elements of personnel administration: an overview of human resource functions; recruitment, selection, and placement; job classification and wage and benefit systems; employee supervision, counseling, discipline, and grievance; the legal framework of human resource administration; and approaches specific to union and nonunion environments. This course is offered as both CES 515 and MBA 532.

3 credits, ABCF grading

MBA 533 Survey of Labor and Employee Relations

This is the foundation course in the labor relations sector of the Human Resource Management curriculum. It addresses the historical development of labor unions in the United States, the evolution of the legal framework governing labor relations today, and the major elements of collective bargaining and dispute resolution techniques used in the private and public sectors. This course is offered as both CES 516 and MBA 533.

3 credits, ABCF grading

MBA 534 Contemporary Issues in Employee Relations

This course covers collective bargaining in America: areas of union growth, stability, and decline. Examination of current labor-management agreements in the key areas of wages, productivity, retirement and health plans, employee security, and career advancement will be explored. The chief problems emerging in current negotiations in both the private and public sectors will be examined. This course is offered as both CES 518 and MBA 534.

Prerequisite: MBA 533
3 credits, ABCF grading

MBA 536 Financial Management

How managers should interface with accounting and finance departments and how firms meet their financial objectives. Financial tools and techniques, which can be used to help firms maximize value by improving decisions relating to capital budgeting, capital structure, and working capital management are explained. Related topics include multinational financial management, risk management, and mergers and acquisitions.

Prerequisite: MBA 502
Fall, 3 credits, ABCF grading

MBA 537 Employee Training and Career Development

This course provides an overview of employee training methods, training design, development programs, and evaluation procedures, including cost/benefit analysis. Emphasis is placed on how to perform a needs analysis, how to select the latest training technologies, and how to apply these technologies to maximize adult learning. In addition, development strategies are reviewed, for instance, when to train generalist managers and specialists, how to foster an atmosphere conducive to continuous learning, and how to reward supervisors for supporting their subordinates' development. Students apply these concepts to a specific organization for hands-on learning. In addition, a focus on career planning and development gives students a chance to take interest inventories and self-assessments of abilities and learning style. Students formulate their own career plans and develop action strategies. This course is offered as both MBA 537 and CEX 537.

3 credits, ABCF grading

MBA 538 Organizational Change and Development: Opportunities for Human Resources Innovations

The aim of this course is to acquaint students with types of organizational change and the roles of human resources managers as change agents. Cases, group exercises, and class discussions are used to examine change methods, employees' reactions to change, facilitation techniques, and evaluation methods. Roles of leaders, managers, employees, and human resources professionals are considered. Targets of change include job designs, interpersonal relationships, and organizational structures. Quality improvement, employee involvement, and professional development are studied as examples of change strategies. Students learn how to help themselves and their co-workers cope. This course is offered as both CEX 538 and MBA 538.

Prerequisite: MBA 532/CES 515
3 credits, ABCF grading

MBA 539 Investment Analysis

Modern investment and traditional approaches to investment valuation, selection, and management. Modern investment theory, including asset pricing models and efficient market hypotheses are explained. Traditional approaches to stock and bond selection, including fundamental analysis and technical analysis, will be explained in detail. Investment management strategies for both individual and institutional investors will be developed and discussed.

Prerequisite: MBA 502
3 credits, ABCF grading

MBA 540 Linear Programming

Formulation of linear programming problems and solutions by simplex method. Duality, sensitivity analysis, dual simplex algorithm, decomposition. Applications to the transportation problem, two-person games, assignment problem, and introduction to integer and non-linear programming. This course is offered as both MBA 540 and AMS 540.

Corequisite: With AMS 540, AMS 505; with MBA 540, a linear algebra course
3 credits, ABCF grading

MBA 543 Management Science

An introduction to mathematical models useful in the analysis of management problems. We motivate each topic by managerial applications, and we analyze problems using modern software. Topics include forecasting models, linear and integer optimization models, and decision models.

3 credits, ABCF grading

MBA 544 Discrete and Nonlinear Optimization

Theoretical and computational properties of discrete and nonlinear optimization problems: integer programming, including cutting plane and branch and bound algorithms, necessary and sufficient conditions for optimality of nonlinear programs, and performance of selected nonlinear programming algorithms. This course is offered as both MBA 544 and AMS 544.

Prerequisite: MBA 540/AMS 540
Spring, 3 credits, ABCF grading

MBA 545 Capital Markets and Financial Institutions

Financial institutions and capital markets form the basis of the financial system in our global economy. Capital markets are the conduits in which capital flows through financial institutions to a network of organized and over the counter markets. Students will learn how many of these markets work in tandem to propel our economy forward. Topics include money markets, foreign exchange markets, derivative markets, the banking industry, and the business of banking. The role of money in the capital markets and a variety of financial products offered by financial institutions will be explained.

Prerequisite: MBA 502
Fall, 3 credits, ABCF grading

MBA 546 Network Flows

Theory of flows in capacity-constrained networks. Topics include maximum flow, feasibility criteria, scheduling problems, matching and covering problems, minimum-length paths, minimum-cost flows, and associated combinatorial problems. This course is offered as both MBA 546 and AMS 546.

Spring, even years, 3 credits, ABCF grading

MBA 550 Operations Research: Stochastic Models

Queuing problems under varying assumptions on input, service mechanism, and queue discipline. Basic ideas of inventory theory. Introduction to statistical decision theory. Monte Carlo methods. This course is offered as both MBA 550 and AMS 550.

Prerequisite: AMS 507 or equivalent
3 credits, ABCF grading

MBA 551 Cases in Finance

Application of finance concepts to cases involving financial decisions in a corporate or institutional setting. Students will be asked to perform the work of a manager or analyst in a professional capacity, direct their attention to specific questions raised and report back with analysis and recommendations from the perspectives of the CFO, the Lending Officer, and other managerial positions.

Prerequisite: MBA 502 and MBA 504
3 credits, ABCF grading

MBA 553 Simulation and Modeling

A comprehensive course in formulation, implementation, and application of simulation models. Topics include data structures, simulation languages, statistical analysis, pseudo-random number generation, and design of simulation experiments. Students apply simulation modeling methods to problems of their own design. This course is offered as CSE 529, AMS 553, and MBA 553.

Prerequisite: CSE 214 or equivalent; AMS 310 or 507 or equivalent; or permission of instructor
3 credits, ABCF grading

MBA 554 Queuing Theory

Introduction to the mathematical aspects of congestion. Birth and death processes. Queues with service priorities and bulk-service queues. Analysis of transient- and steady-state behavior. Estimation of parameters. Applications to engineering, economic, and other systems. This course is offered as both MBA 554 and AMS 554.

Fall, even years, 3 credits, ABCF grading

MBA 556 Dynamic Programming

Stochastic and deterministic multistage optimization problems. Stochastic path problems. Principle of optimality. Recursive and functional equations. Method of successive approximations and policy iteration. Applications to maintenance, inspection, and replacement problems. This course is offered as both MBA 556 and AMS 556.

Prerequisite: MBA/AMS 550 or MBA/AMS 558
3 credits, ABCF grading

MBA 558 Stochastic Processes

Includes a review of probability theory, Poisson processes, renewal theory, Markov processes, applications to queues, statistics, and other problems of engineering and social sciences. This course is offered as both MBA 558 and AMS 558.

Spring, 3 credits, ABCF grading

MBA 559 Computational Finance

Computation in corporate finance, securities valuation, portfolio theory, and trading. Approaches to corporate valuation. Application of full covariance treatment of portfolio returns and variance to mutual funds. Nonlinear dynamics in finance.

3 credits, ABCF grading

MBA 560 Design and Analysis of Management Information Systems

An overview of information systems and the system development life cycle. Emphasis is on tools and techniques that the programmer or analyst can use to document information systems. Classical and structured tools for describing data flow, data structure, process flow, file design, input and output design, and program specifications will be presented. Object-oriented techniques will be introduced. The course will survey other important skills for the systems analyst such as fact-finding, communications, project management, and cost-benefit analysis.

Prerequisite: MBA 517
3 credits, ABCF grading

MBA 561 Expert Systems for Management

An introductory course that provides a basic understanding of the concepts and techniques needed to analyze, design, and manage the knowledge of human experts in organizations. In addition, students will learn the role of the knowledge architect in different industries and the management issues related to the growing integration of computers in the support of decision-making.

3 credits, ABCF grading

MBA 563 Local Area Network Implementation and Applications

The design, physical layout, and management aspects of installing, maintaining, and troubleshooting local area networks. Issues in the selection and implementation of applications packages designed for network use. Network administration with monitoring and management tools.

3 credits, ABCF grading

MBA 565 Marketing Research

Introduces marketing research tools that aid managers in marketing decision-making; introduces the marketing research process and explains how it can be used to collect and analyze data and information necessary to solve marketing problems. A strong applied orientation exposes students to marketing research in traditional areas such as market segmentation, product positioning, product design, brand perception, sales forecasting as well as emerging areas such as customer satisfaction, customer relationship management (CRM), and online marketing.

Spring, every year, 3 credits, ABCF grading

MBA 566 Business Law

A survey of the U.S. legal system within which business operates. Topics include sources of law, contracts, tort and criminal law affecting business, property rights, agency, business organizations, and selected topics in technology related areas.

Spring, every year, 3 credits, ABCF grading

MBA 569 Probability Theory I

Probability spaces and sigma-algebras, random variables as measurable mappings, Borel-Cantelli lemmas, expectation using simple functions, monotone and dominated convergence theorems, inequalities, stochastic convergence, characteristic functions, laws of large numbers, and the central limit theorem

will be covered. This course is offered as both AMS 569 and MBA 569.

*Prerequisite: AMS 504 or equivalent
3 credits, ABCF grading*

MBA 570 Entrepreneurship

This course helps the student develop a business plan for his or her own business idea or a plan for an entrepreneur. With the support of visiting practitioners, students take a business idea through all the planning steps. A business plan suitable for presentation to potential investors will be written and presented orally at the end of the class.

3 credits, ABCF grading

MBA 572 Business Plan Project I

Students will team with a group from engineering to develop a business plan for the engineers' senior design project. Business students will create and monitor a project plan and perform market research for the engineering project, provide input to the design phase to maximize market satisfaction and develop a marketing plan. Students will interface with resources outside the University involved in market research.

*Prerequisite: Permission of instructor
Fall, 3 credits, ABCF grading*

MBA 573 Business Plan Project II

Building on the marketing plan developed in MBA 572, students will prepare a detailed operations and finance plan. The project plan developed in the fall will be used to monitor progress of the team, including both Engineering and Business students' activities. Final project will consist of a full written and oral presentation of the business plan. Students will coordinate efforts with resources outside the University including interface with outside sources of production material.

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading*

MBA 586 Wireless E-Commerce

Analyzes the growth of and interaction among wireless markets. These markets include devices and services for wide area broadband networks and 802.11b wireless local area networks. Growth factors include business strategies executed by major firms and startups, and roles played by government regulations and community groups in development and delivery of network technology. Student projects for clients or one's own startup investigate wireless strategies in consumer, home, commercial, educational or health care markets.

Spring, 3 credits, ABCF grading

MBA 587 Decision Support Systems

An advanced course focusing on the interrelationships among management information systems, statistics and management science. Both model-driven and data-driven decision support systems will be considered. Students will identify an appropriate business application, select suitable management science and statistical methodologies, build the required information system, and demonstrate how their decision support system addresses the stated management problem.

*Prerequisites: MBA 503, MBA 517, MBA 543
3 credits, ABCF grading*

MBA 588 Database Management

Database processing is the foundation upon which all current applications rely and represent the repositories of business intelligence that play a crucial role in the strategic success or failure of a corporation. Even though they vary in size, complexity and organizational scope, there is an underlying common database engine that can be used to manipulate and analyze the stored information. The purpose of this course is to introduce the business professional to the fundamental concepts of database creation, design, application integration, maintenance, management, and subsequent analysis.

3 credits, ABCF grading

MBA 589 Operations Management

A managerial approach to the concepts, issues and techniques used to convert an organization's resources into products and services. Topics include strategic decisions for planning products, processes, and technologies, operating decisions for planning production to meet demand, and controlling decisions for planning and controlling operations through teamwork and Total Quality Management (TQM). Operational problems in producing goods and services are reviewed. This course is offered as both MBA 589 and EMP 506.

Spring, 3 credits, ABCF grading

MBA 592 Organizational Behavior

An approach to understanding the behavior of individuals in organizations is developed, with emphasis on implications for effective management. This approach is used to analyze decision problems encountered in managing human resources. Topics include individual and group decision-making skills, recruitment and selection, employee ability, motivation and incentive systems, job satisfaction, performance assessment and management, retention, training, and employee development.

Fall, every year, 3 credits, ABCF grading

MBA 593 Special Topics in Human Resource Management

An experimental elective course offered on a one-time basis. Courses offered under this course focus on specialized topics in human resource management. Consult department for current topic(s).

3 credits, ABCF grading

May be repeated 5 times for credit

MBA 595 Individual Directed Research in Business

Designed to accommodate independent research projects on an individual basis with faculty guidance.

Fall and spring, 1-6 credits, ABCF grading

May be repeated for credit

MBA 599 Internship Practicum

Designed to accommodate College of Business MBA graduate students working on their internship project requirement while under supervision of an advisor.

*Fall, spring, and summer, 0-1 credits,
S/U grading*

MBA 800 Summer Research

May be repeated for credit

Chemistry (CHE)

Chairperson: Michael White, Chemistry Building 104 (631) 632-7885

Graduate Program Director: Dale Drueckhammer, Chemistry Building 741 (631) 632-7923

Student Affairs Coordinator: Chemistry Building 104 (631) 632-7886

Degrees awarded: M.S. in Chemistry; Ph.D. in Chemistry

The Department of Chemistry, within the College of Arts and Sciences, offers courses of study leading to the degrees of Master of Arts in Teaching Chemistry, Master of Science, and Doctor of Philosophy. Students in the M.A.T. program must register through the School of Professional Development. A student in the Ph.D. program may choose dissertation research in any one of the diverse areas of chemistry represented by the interests of the program faculty, or may choose an interdisciplinary topic under the guidance of a faculty member in another program. Coordinated activities exist with several programs, and include optional concentrations in chemical physics and chemical biology.

Facilities

The Chemistry Building is a modern, seven-story (170,000 sq. ft.) structure designed for research and upper-division instructional activities. The equipment available to faculty, postdoctorals, and students is outstanding. While much of it has been commercially obtained, a substantial portion of the instrumentation of the department has been designed and constructed at Stony Brook and represents the state of the art in various fields. Strong ties exist to programs at Brookhaven National Laboratory, with unique facilities in PET and magnetic resonance imaging, the Relativistic Heavy Ion Collider, the National Synchrotron Light Source, the Center for Functional Nanomaterials, and world-class programs in spectroscopy, dynamics, and materials science.

The construction and maintenance of this instrumentation is affected by the faculty in conjunction with a staff of nonteaching professionals in the electronic, glass, and machine shops. Our nuclear magnetic resonance (NMR) and computer facilities are staffed by an NMR coordinator and a computer coordinator, respectively.

Areas of Current Research Synthetic Chemistry

The synthesis of new molecular compounds distinguishes chemistry from other scientific disciplines. Although many disciplines study the properties of materials and natural phenomena, only chemistry concerns itself with the preparation of new molecular arrangements. The success of past synthetic efforts can readily be appreciated by observing the vast array of new materials that have improved the quality of our lives.

The Chemistry Department at Stony Brook is very fortunate to have many strong synthetic programs in both organic and inorganic chemistry. Among the studies underway are the search for inventive synthetic reactions to produce new molecules, the synthesis of new molecular structures to evaluate our theories of chemical bonding, and the synthesis of new compounds with unusual physical properties (molecular engineering). However, most of the synthetic interest in the program lies in the areas of bio-organic and bio-inorganic chemistry. Synthetic chemistry is being applied to the understanding of receptor-substrate interactions as well as of enzyme function, the preparation of artificial enzymes, the mechanism of mutagenesis and carcinogenesis, and the preparation of new compounds for the treatment of patients.

Organometallic Chemistry

Organometallic chemistry is an interdisciplinary field bringing together many aspects of inorganic and organic chemistry. A wide range of organometallic systems are under study using a variety of synthetic, structural, mechanistic, and theoretical techniques. Synthetic and structural research is focused on such problems as the chemistry of unsaturated metal-carbon bonds in metal carbene and carbyne complexes, the stabilization of highly reactive organic moieties through metal complexation, the chemistry of transition metal carbonyl cluster compounds, and the development of useful synthetic

reagents. Homogeneous catalysis studies include investigations of the carbonylations of fluoroolefins, small-ring heterocycles, alkenylamides, and similar molecules, and catalytic applications of compounds with unsaturated metal-carbon bonds. Theoretical work includes *ab initio* and qualitative molecular orbital studies of organometallic compounds and of the chemisorption of organic molecules onto metal surfaces and molecular mechanics minimizations of ligand geometries.

Structural and Mechanistic Organic Chemistry

The structures of a wide range of organic molecules are examined at Stony Brook using many techniques, including automated high-field FT-NMR spectroscopy (¹H, ¹³C, ¹⁹F, etc.) and X-ray crystallography. Molecular modeling programs, such as Macromodel, are operated on color graphics workstations in order to rationalize and predict the conformations and reactivities of molecules under study. Variable-temperature ¹H and ¹³C NMR spectroscopy is used to investigate conformational changes in macrocycles and other synthetic hosts for guest metal ions and organic molecules. VT-NMR is also used to investigate proton transfer in polyamines and intermolecular exchange of guest ions between polydentate ligands. Stereochemical probes are used to examine mechanisms of organic reactions such as pericyclic and biomimetic processes, and have provided proof of the existence of sigma-participation in reactions of unstrained ketones and carbonium ions. Reaction mechanisms are also studied by determining activation volumes using reactors in the high-pressure laboratory that can attain pressures higher than 200,000 psi.

Institute of Chemical Biology and Drug Discovery (ICB&DD)

The primary objective of ICB&DD, directed by Distinguished Professor Iwao Ojima, is to establish a world-class "Center of Excellence" in chemical biology and drug discovery at Stony Brook. The rapid and impressive advancement of

chemical biology in the last decade clearly demonstrated that solutions for a vast majority of medical problems rely on the understanding of the molecular basis of diseases, therapeutic targets, drug actions, and drug resistance. ICB&DD promotes highly productive interdisciplinary and collaborative research among chemists, biologists, medicinal chemists, pharmacologists, and physicians to attack major and significant biomedical problems to find solutions including the discovery of novel therapeutic drugs.

Biological Chemistry

A significant number of the faculty are using their chemical expertise to explore the chemical and physical details of biological phenomena. Research programs span biological chemistry, enzyme mechanisms, protein folding, membrane structure and function, biophysics and structural biology. Techniques such as high resolution NMR, stop-flow kinetics, fluorescence and Raman spectroscopy are used to probe protein structure, function, and folding. Novel biosynthetic and chemical strategies are being used to generate small molecules for use in probing enzyme mechanisms and exploring ligand-receptor interactions.

Inorganic Chemistry

Inorganic chemistry, being concerned with the synthesis, structure, and dynamics of the compounds formed by the more than 100 natural and synthetic elements, covers an extremely vast area of chemistry. New compounds and new synthetic methods are among the goals of inorganic chemistry. Such compounds range from materials important in technology to catalysts for industrial chemical processes, small molecules present in outer space, and metal complexes that serve as models for biological materials. The methodologies utilized in inorganic chemistry include a wide variety of spectroscopic techniques, kinetic methods, procedures for the elucidation of geometric and electronic structures, and theory. The breadth and depth of inorganic chemistry are well represented at Stony Brook, as seen by the following examples of current research: thermally and photochemically activated dynamic processes, in particular, electron transfer reactions; synthetic and structural studies of active site analogs of metalloenzymes such as the zinc proteins that

regulate gene transcription and the high-potential iron-sulfur proteins; activation of small molecules by transition metal complexes and homogeneous catalysis; chemistry of unsaturated carbon-metal bonds in mononuclear compounds and in extended molecular assemblies; molecular orbital calculations and molecular mechanics methods applied to transition metal cluster compounds and related organometallic substances; NMR studies of zeolites and supported catalysts.

Magnetic Resonance

Magnetic resonance in the Chemistry Department ranges from studies in physiology to studies in chemical physics. Topics under investigation include the use of liquid and solid state nuclear magnetic resonance (NMR) spectroscopy and micro-imaging techniques with stable spin 1/2 and quadrupolar nuclides to study inorganic, organic, biological, and living systems. Projects in progress employ a range of single and N-dimensional NMR spectroscopic techniques and novel imaging techniques to elucidate chemical processes and determine the structures of biological and organic molecules in solution.

Novel NMR methods are being developed for the determination of the structures of micro- and macromolecules as they exist in disordered solids and to study the structure and dynamics of molecules in the liquid crystalline state and those absorbed on solid surfaces. Pulsed electron paramagnetic resonance (EPR) techniques are being developed to study metalloenzymes, organic conductors, and other molecules.

The NMR facility in the Department of Chemistry includes seven NMR spectrometers, a multinuclear, research grade, 600 MHz (14.1 T) spectrometer with 3-axis field gradient capability and a standard 51 mm bore magnet for liquids and solids CP/MAS spectroscopy, a multinuclear, research grade, 500 MHz (11.75 T) spectrometer with z-axis field gradient capability and a standard 51 mm bore magnet for liquids spectroscopy, a multinuclear research grade spectrometer at 400 MHz (9.4 T) with an 89 mm wide bore magnet that is available for imaging and solids spectroscopy, a 300 MHz (7.0 T) spectrometer with a z-axis gradients for routine liquid NMR spectroscopy, a multinuclear 250 MHz (5.88 T) standard bore magnet spectrometer

that is also available for routine NMR spectroscopy, and two wide bore spectrometers dedicated to solids.

Macromolecules

With development of state-of-the-art X-ray diffraction and small-angle X-ray scattering (SAXS) at the State University of New York's X3 Beamline at the National Synchrotron Light Source at Brookhaven National Laboratory, the polymer and biomacromolecular physics group, being members of the participating research team (PRT), possesses one of the most powerful X-ray scattering facilities in the country. The experiments at Stony Brook make use of a wide variety of complementary techniques such as SAXS, laser light scattering, photon correlation spectroscopy, fluorescence photobleaching recovery, holographic relaxation spectroscopy, transient electric birefringence, and various forms of nuclear magnetic resonance spectroscopy. Stony Brook scientists can perform measurements to determine the structure and dynamical behavior of advanced polymeric materials, supramolecular systems, and biomacromolecules. Time-dependent processes can be studied using stop-flow, steady-flow, pressure-jump, and temperature-jump experiments together with time-resolved capabilities using intense radiation sources such as pulsed lasers and the synchrotron radiation. Unparalleled opportunities exist for interdisciplinary research using unique and novel instrumentation in polymer materials, polymer physics, colloid science, and biophysical chemistry.

Photon-Molecule Interactions

Recent developments in the use of lasers for the investigation of molecular structure and dynamics have led to a revolution in the fields of molecular spectroscopy and dynamics. Intimate details about the structure and interactions of atoms and molecules can now be studied to an extent never before possible. In this program the systems being studied by laser spectroscopy range from atoms and diatomic molecules to molecular crystals and polymers. In these systems various properties are being investigated, including nonlinear interactions with the radiation field, excited state electronic structure, radiationless transitions, ionization mechanisms, crystal field interactions, and

photochemical reactions, as well as electron and energy transfer processes. Luminescence spectroscopy, luminescence excitation, multiphoton ionization, multiphoton photoelectron spectroscopy, Raman spectroscopy, and vacuum ultraviolet spectroscopy are among the techniques being used and developed for the ever greater understanding of atomic and molecular systems.

Soft X-Ray Spectroscopy

The National Synchrotron Light Source at Brookhaven National Laboratory, located only 15 miles from Stony Brook, provides unique opportunities for frontier research in chemistry. The synchrotron and associated devices are unequaled sources of high-intensity X-ray and vacuum ultraviolet radiation. One area of current research uses soft X-rays, photons with energies of 100 to 1000 eV, to investigate the excitation and relaxation of core electrons in molecules. Because core electrons, e.g., the 1s electrons of carbon, are tightly bound to individual atoms, the excitation energy is essentially localized on a particular atom in the molecule. This localization has the potential for producing photochemistry with far greater atomic site specificity than can be achieved by excitation of valence electronics with visible and ultraviolet light.

Surface Chemistry

Catalysis, corrosion, and friction are a few examples of familiar processes that occur on solid surfaces. The field of surface chemistry tries to unravel and understand the basic chemical principles that underlay such phenomena. At Stony Brook we are actively researching how the electronic and geometric structure of a surface affects its chemical selectivity and reactivity during surface-mediated processes such as catalysis and the chemical vapor deposition of metals from organometallic precursors. In addition, we are interested in understanding the interactions between energetic ions and surfaces in both atmospheric and metal-etching reactions. An arsenal of sophisticated techniques is available to prove both the geometric and electronic structures of a reacting surface on an atomic level. Techniques such as Auger electron spectroscopy (AES) and high-resolution, electron energy loss spectroscopy (HREELS) are used to determine the

composition of a surface, while ultraviolet and X-ray photons are commonly used to eject photoelectrons from a surface (which are energy analyzed) yielding electronic structure information. Another technique, low-energy electron diffraction (LEED), exploits the wave nature of electrons and is used to help determine the geometric structure of a surface. These techniques, routinely used at Stony Brook, are complemented by the powerful extended- and near-edge X-ray absorption fine-structure techniques (EXAFS and NEXAFS), available at the National Synchrotron Light Source at nearby Brookhaven National Laboratory.

Theoretical Chemistry

Theoretical investigations of a wide variety of chemical phenomena are underway at Stony Brook. Research programs in electronic structure theory are concerned with the development of formalism and computational techniques. Applications include determination of the geometry, spectral shifts, and reaction pathways of molecules chemisorbed onto metal surfaces; calculation of the structure of molecules in highly excited Rydberg states; and evaluation of probability amplitudes for multiphoton excitation and calculation of Born corrections, Born couplings, and orbital stresses in small molecules. In the field of statistical mechanics, analysis and numerical simulation are combined to obtain properties of liquids and ionic solutions from the properties of their constituent molecules and their interactions. Much of this work is focused on the calculation of pair correlation functions, transport properties and dielectric phase diagrams, solvent effects, and rates of electron transfer reactions. Other current work includes theory of photon-molecule interactions, quantum ensembles, Jahn-Teller dynamics, and lifetimes of quasistationary molecular states. In addition, students often do theoretical work closely related to active experimental programs under the joint guidance of a theorist and an experimentalist.

Nuclear and Isotope Chemistry

Nuclear chemistry research at Stony Brook has focused on reactions induced by heavy ion beams. Beams are obtained from accelerators located at Stony Brook, Berkeley, Chicago, Michigan, and France. The reactions produce very hot and rapidly rotating atomic nuclei that

are studied by observation of particles and fragments that are emitted. Their energies and angles of emission allow for a reconstruction of the properties of the hot emitting nuclei and the mechanism of their production.

Isotope chemistry deals with the small differences in physical and chemical properties of matter that have their origin in the mass difference of isotopes of an element. Although the effects are small, they can be measured with high precision. In general, the effects are quantum effects, and measurement of isotope effects has proven to be a unique method for the study of molecular and intermolecular forces. Isotope effect studies have found application in chemical physics, organic chemistry and biochemistry, geochemistry, and anthropology. Practical applications are found in isotope separation processes. Our present efforts are concentrated on the systematization of isotope chemistry.

Admission

The following, in addition to the minimum Graduate School requirements, are required for admission to graduate study in chemistry:

A. A bachelor's degree in chemistry earned in a curriculum approved by the American Chemical Society, or an equivalent course of study;

B. A minimum grade point average of 3.00 (B) in all undergraduate work and 3.00 (B) in all courses in the sciences and mathematics;

C. Results of the Graduate Record Examination (GRE) General Test;

D. Acceptance by the Department of Chemistry and by the Graduate School.

In exceptional cases, a student not meeting requirements A and B may be admitted on a provisional basis.

Faculty

Distinguished Professors

Bigeleisen, Jacob, *Distinguished Professor Emeritus*. Ph.D., 1943, University of California at Berkeley: Statistical mechanical theory of isotope chemistry.

Chu, Benjamin, Ph.D., 1959, Cornell University: Laser light scattering; synchrotron X-rays; rheometry; laser induced fluorescence; nano-/microstructures and supramolecular formation in polymer colloids; complexation in photoelectrolytes and surfactants; capillary electrophoresis; supercritical fluids; molecular composites; blends and fibers.

Ojima, Iwao, Ph.D., 1973, University of Tokyo, Japan: Development of new and effective methodologies for the syntheses of bioactive compounds of medicinal interest based on organic and organometallic chemistry; medicinal chemistry and chemical biology of anti-cancer agents, MDR reversal agents, and enzyme inhibitors.

Stell, George R., *Distinguished Research Professor*. Ph.D., 1961, New York University: Statistical thermodynamics; molecular theory of fluids; theories of gelation and polymerization.

Professors

Alexander, John M., Ph.D., 1956, Massachusetts Institute of Technology: Reactions between complex nuclei; use of detected ejectiles to characterize super-heated emission sources.

Drueckhammer, Dale G., Ph.D., 1987, Texas A&M University: Bioorganic chemistry; computer-guided design in molecular recognition, design and synthesis of receptors and sensors for biological molecules; chemistry and enzymology of coenzyme A.

Fowler, Frank W.¹, Ph.D., 1967, University of Colorado: The development of methods for the preparation of supramolecular assemblies and their application to problems in material science.

Grey, Clare P., D.Phil., 1991, Oxford University, England: Materials chemistry; solid-state NMR spectroscopy; characterizing and studies of anionic conduction in fuel cell membranes and structure of battery materials; environmental chemistry; modifying reactive sites in catalysts.

Haim, Albert², *Emeritus*. Ph.D., 1960, University of Southern California: Kinetics and mechanisms of inorganic reactions.

Hanson, David M., Ph.D., 1968, California Institute of Technology: Design and development of classroom learning structures; text- and web-based learning systems; course assessment systems.

Hsiao, Benjamin S., Ph.D., 1987, University of Connecticut: Polymer physics; polymer crystallization; structure and property relationships in nanostructured polymers; nanocomposites and biodegradable polymers; polymers for biomedical applications; synchrotron X-ray scattering and diffraction.

Ishida, Takanobu, *Emeritus*. Ph.D., 1964, Massachusetts Institute of Technology: Isotope effects, stable isotope separation, electrochemistry of nitrogen oxides and carbon oxides in biological fluids.

Johnson, Francis³, Ph.D., 1954, Glasgow University, Scotland: Structure and total synthesis of naturally occurring biologically active molecules; DNA damage and enzymatic repair mechanisms; new synthetic methods in organic synthesis; heterocyclic chemistry.

Johnson, Philip M., Ph.D., 1967, Cornell University: Optical molecular spectroscopy and the electronic structure of molecules; development of spectroscopic techniques using high powered lasers.

Kerber, Robert C.⁴, *Distinguished Teaching Professor*. Ph.D., 1965, Purdue University: Chemical education, especially effects of terminology on learning; history of chemistry.

Koch, Stephen, Ph.D., 1975, Massachusetts Institute of Technology: Synthesis and structure in transition metal coordination chemistry; metal ions in biological systems; early transition metal catalysts.

Lacey, Roy A.⁵, Ph.D., 1987, Stony Brook University: Nuclear chemistry; intermediate and relativistic energy heavy ion reaction studies.

Lauher, Joseph W.⁶, Ph.D., 1974, Northwestern University: Structural chemistry; design and synthesis of new inorganic and organic materials; hydrogen bonding; molecular graphics; X-ray crystallography.

le Noble, William J., *Emeritus*. Ph.D., 1957, University of Chicago: Stereoelectronics with applications such as nucleophilic and electrophilic addition, oxidation and reduction, metal complexation, pericyclic reactions and the reverse processes; reactions in compressed solutions.

London, Erwin⁷, Ph.D., 1979, Cornell University: Lipid-protein and protein-protein interactions in membranes; membrane protein folding and translocation by membrane penetrating toxins; cholesterol and lipid domain formation.

Mayr, Andreas, Ph.D., 1978, University of Munich, Federal Republic of Germany: Reactivity of metal-carbon multiple bonds; synthesis of molecular components for nanocomputing.

Parise, John B.⁸, Ph.D., 1981, University of North Queensland, Australia: Synthetic solid-state chemistry; structural chemistry; crystallography; materials research.

Parker, Kathlyn A., Ph.D., 1971, Stanford University: Organic synthesis; synthetic methods; natural products, non-natural nucleosides; designed enzyme inhibitors; molecular tools for biochemistry.

Raleigh, Daniel P., Ph.D., 1988, Massachusetts Institute of Technology: Biological chemistry; experimental studies of protein folding and protein stability; studies of amyloid formation; NMR studies of protein dynamics.

Sampson, Nicole S., Ph.D., 1990, University of California, Berkeley: Enzyme mechanisms and protein-protein interactions; the use of organic synthesis, kinetics and mutagenesis to probe the structure and function of enzymes and cell-surface recognition proteins.

Tonge, Peter J., Ph.D., 1986, University of Birmingham, England: Biological chemistry and enzyme mechanisms; quantitating substrate strain in enzyme-substrate complexes using vibrational spectroscopy; rational drug design.

White, Michael, Ph.D., 1979, University of California, Berkeley: Surface chemical dynamics; catalysis; photo-induced reactions; molecular spectroscopy; molecular beam scattering.

Associate Professors

Goroff, Nancy, Ph.D., 1994, University of California, Los Angeles: Design and synthesis of carbon-rich organic molecules and materials; halocumulenes and alkynes; 3-dimensional chromophores for biological fluorescence studies; cyclophenacenes ("buckybelts") and other unusual conjugated systems.

Millar, Michelle M., Ph.D., 1975, Massachusetts Institute of Technology: Reactivity, electronic, and structural properties of transition metal complexes; organometallic chemistry; bio-inorganic chemistry.

Schärer, Orlando D.³, Ph.D., 1996, Harvard University: Chemical biology of mammalian DNA repair.

Schneider, Robert F.⁹, Ph.D., 1959, Columbia University: Chemical education; web-based instruction; laboratory instruction.

Simmerling, Carlos, Ph.D., 1994, University of Illinois, Chicago: Computational chemistry and structural biology; molecular dynamics of biological macromolecules.

Wishnia, Arnold, Ph.D., 1957, New York University: Physical chemistry of biological macromolecules; structure and function of ribosomes; membrane model systems; applications of nuclear magnetic resonance.

Assistant Professors

Wang, Jin, Ph.D., 1991 University of Illinois: Physics and chemistry of biomolecules; single molecule reaction dynamics.

Wong, Stanislaus, Ph.D., 1999, Harvard University: Nanoscience; physical chemistry; biophysical chemistry; materials science; scanning probe microscopy imaging of nanomaterials; synthesis and characterization of nanostructures such as nanocrystals and nanotubes; physical, chemical, and biological applications of nanotechnology.

Adjunct Professors

Ding, Yu-Shin, Ph.D., 1987, Stony Brook University: Development of PET radiotracer methodologies; investigation of functional changes in the brain related to neurological and psychiatric disorders, aging, neurodegenerative disease, drug abuse, and drug therapy.

Fowler, Joanna, Ph.D. 1968, University of Colorado: Organic synthesis with short-lived positron-emitting isotopes; neuroscience; drug mechanisms; brain imaging.

Marecek, James F., Ph.D., 1971, Case Western Reserve University: Chemical synthesis.

Rodriguez, Jose A., Ph.D., 1988, Indiana University: Surface chemistry and catalysis.

Sears, Trevor John, Ph.D., 1979, Southampton University, England: Gas phase laser spectroscopy; frequency modulation; free radical spectroscopy; molecular structure and dynamics; small metallic clusters.

Adjunct Assistant Professors

Raineri, Fernando O., Ph.D., 1987, University of Buenos Aires: Theoretical chemistry; solvent effects on electron transfer reactions; equilibrium and nonequilibrium solvation; thermodynamics, structure and dynamics of liquids and solutions.

Rizzo, Robert C., Ph.D., 2001, Yale University: Quantifying molecular recognition with quantitative structural biology.

Number of teaching, graduate, and research assistants, fall 2005: 130

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1995

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1981

3) Joint appointment, Department of Pharmacology

4) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1986; Recipient of the President's Award for Excellence in Teaching, 1986

5) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1998; Recipient of the President's Award for Excellence in Teaching, 1998

6) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990; Recipient of the President's Award for Excellence in Teaching, 1990

7) Joint appointment, Department of Biochemistry

8) Joint appointment, Department of Geosciences

9) Recipient of the State University Chancellor's Award for Excellence in Teaching, 2001; Recipient of the President's Award for Excellence in Teaching, 2001

Degree Requirements**Requirements for the M.S. Degree in Chemistry**

A. Successful completion of an approved course of study comprising at least 30 credits of graduate coursework. A student must achieve a 3.0 overall grade point average in all courses taken at Stony Brook to receive a degree.

B. Successful completion of the CHE 532 seminar and six courses made up from any of the following groups: CHE 501 through 530, 541, 542, 557 through 589, 601 through 604, 623 through 683, and approved courses offered through other programs or through the School of Professional Development (SPD).

C. Successful completion of the CHE 590 term paper or research, thesis, and thesis defense.

Requirements for the M.A. Degree in Teaching Chemistry

The curriculum for a Master of Arts in Teaching Chemistry consists of 36 credits distributed among graduate-level course offerings in chemistry, other sciences and mathematics, teaching methods in

both science and general education, and practice teaching in secondary schools. Individual programs are tailored to the background and interests of the student in consultation with an advisor.

Requirements for the Ph.D. Degree in Chemistry**A. Courses**

Successful completion of an approved course of study comprising at least six formal graduate courses of which four are selected from CHE 501 through 550, in addition to CHE 531, 532, and two semesters of Teaching Practicum (CHE 610, 611) or the equivalent is required. The following courses are recommended for inclusion among the six formal courses, distributed from among at least two of the following four groups: Group I—one of CHE 521, 522, 523, 528; Group II—one of CHE 511, 514, 515; Group III—one of CHE 501, 502, 503, 504; Group IV—one of CHE 530, 541, 542. Continuation in the Ph.D. program is based, in part, on achievement in four 500-level chemistry courses to be taken during the student's first year. In consultation with faculty advisors each student selects a course of study to acquire a good background for research in the area of chemistry chosen.

B. Advancement-to-Candidacy (Preliminary) Examination

A student is advanced to candidacy for the Ph.D. degree when all degree requirements except the dissertation have been completed. A special committee is designated for each student to aid in progressing toward this step. The committee is charged with advising the student and administering the advancement-to-candidacy (preliminary) examination. This examination, normally completed within two years following qualification to the Ph.D. degree, consists of a written proposition and oral defense, a discussion of the student's research, and discussion or evaluation of the recent literature.

C. Presentation of a Departmental Seminar**D. Research, Dissertation, Dissertation Defense, and Departmental Colloquium**

Each student selects a faculty research advisor at some time after the middle of the first semester and usually before the middle of the second semester. The research advisor also serves on the advancement-to-candidacy committee.

Specific inquiries from prospective graduate students regarding research opportunities are welcomed and should be addressed to the chairperson. The *Graduate Programs in Chemistry* brochure states in some detail the varied research interests of the chemistry faculty and is available from the department.

E. Residence

A one-year residence is required.

F. Teaching

Three semesters of teaching experience are required. In some cases, research activity may be substituted in lieu of one semester of teaching.

Requirements for the Ph.D. Degree, Concentration in Chemical Physics

A field of concentration in chemical physics is provided for students whose interests lie in both chemistry and physics. A graduate student who is admitted to either the Chemistry or Physics Department may elect this course of study with the consent of the department chairperson. A chemistry student elects this course of study to obtain more extensive training in physics than is normally required by chemistry programs. A physics student elects this concentration to obtain more extensive exposure to chemical systems than is normally obtained in physics programs. A student in the chemical physics concentration may select a research advisor from either program subject to the approval of the chairpersons.

For a chemistry student the requirements are the same as for the Ph.D., with the following exceptions.

A. Courses

CHE 531, 532, two semesters of CHE 610 or 611, and six graduate courses are required, including the following:

1. CHE 523 Chemical Thermodynamics
2. Either CHE 521 Quantum Chemistry I or PHY 511 Quantum Mechanics I
3. One course from among CHE 501, 502, 504, 511, 514, 515, 541, 542 (Organic/Inorganic/Biological Chemistry)
4. Three courses from among CHE 522, 524, 525, 526, 527, 528, 529, and 530 and PHY 501, 503, 505, 540, 551, 555, and 565. Other graduate courses can be

substituted only with prior permission of the graduate advisement committee. A prerequisite for the Chemical Physics Program is undergraduate training in classical mechanics and electromagnetic theory at or above the level of PHY 301 Electromagnetic Theory and PHY 303 Mechanics. Students in Chemical Physics must take these courses unless they receive waivers from the graduate advisement committee.

B. Advancement-to-Candidacy (Preliminary) Examination

In some cases a hybrid of the chemistry and physics requirements may be used.

Requirements for the Ph.D. Degree, Concentration in Biological Chemistry

The field of concentration in biological chemistry is a course option for students whose interests lie in both chemistry and biology. A graduate student who is admitted to the Chemistry Department or another appropriate program may elect this field of concentration with the consent of the graduate coordinator. The course of study can provide more extensive training in biology than is normally required for a chemistry graduate degree and more extensive exposure to fundamental chemical studies for students in other programs. In addition, a student may select a research advisor in any appropriate program, subject to the approval of the chairpersons involved.

A. Courses

CHE 531, two semesters of CHE 610 or 611, and six graduate courses are required, including the following:

1. Two courses from among CHE 501-530.
2. A minimum of two graduate biology/biochemistry-oriented courses (for example, BMO 520, BMO 512, CHE 541, CHE 542) as approved by the graduate advisement committee. Students will normally take CHE 541 and 542. A prerequisite for the Biological Chemistry Program is undergraduate training in biology or biochemistry at or above the level of BIO 361 Biochemistry I. Students in the Biological Chemistry Program must take this course unless they receive a waiver from the graduate advisement committee.

B. Advancement-to-Candidacy (Preliminary) Examination

Must complete two semesters each of CHE 619 and 694. These courses replace CHE 532 and other literature presentation requirements for advancement to candidacy.

Courses

CHE 501 Instrumental Methods in Chemistry
Practical and theoretical aspects of instrumentation in chemistry. The primary emphasis is on contemporary methods of molecular structure determination such as X-ray crystallography, NMR, IR, and MS. Other topics may also be presented.

Spring, 3 credits, ABCF grading

CHE 502 Mechanistic Organic Chemistry
Important reaction mechanisms and the methods by which they are studied. Substituent and medium effects on reactions proceeding through concerted mechanisms and unstable intermediates are discussed.

Spring, 3 credits, ABCF grading

CHE 503 Synthetic Organic Chemistry

A survey of the most important organic reactions from the viewpoint of synthetic utility, including many recent innovations in this field. Throughout the discussion of these methods, emphasis is placed upon their use in the synthesis of complex organic structures.

Spring, 3 credits, ABCF grading

CHE 504 Structure and Reactivity in Organic Chemistry

Electronic and stereochemical theories relating to organic structure and reactions. Topics such as bonding, strain, aromaticity, MO theory, molecular rearrangements, pericyclic reactions, and photochemistry are covered. This course is intended to provide a foundation of knowledge at the beginning graduate level as preparation for advanced subjects in CHE 502 and CHE 503, and is complementary to CHE 501.

Fall, 3 credits, ABCF grading

CHE 511 Structural Inorganic Chemistry

Properties and reactions of inorganic compounds are considered from the viewpoint of molecular and electronic structure. The modern bonding theories used in inorganic chemistry including molecular orbital, valence bond, and ligand field theories are developed using symmetry and group theory. Selected main group, transition metal, and organometallic compounds are discussed. An introduction to crystallography and solid-state structure is included.

Fall, 3 credits, ABCF grading

CHE 514 Transition Metal Chemistry

A survey course with an emphasis on the transition metals. Reaction mechanisms, synthesis, and structure are covered. Specific areas of concern include coordination chemistry, organometallic chemistry, bioinorganic chemistry, and selected topics from solid-state and non-transition metal chemistry.

Spring, 3 credits, ABCF grading

CHE 515 Advanced Inorganic Chemistry

A topical course with an emphasis on the current literature. Subject matter varies and is announced in advance. Possible subjects include reaction mechanisms, organometallic chemistry, bioinorganic chemistry, and physical inorganic chemistry. May be repeated as the subject matter varies.

Spring, 3 credits, ABCF grading

CHE 521 Quantum Chemistry I

Quantum theoretical concepts are discussed. Schrodinger wave mechanics and related mathematical techniques are illustrated by treatment of systems of chemical interest. Designed to form the theoretical basis for the study of chemical bonding, molecular structure, spectroscopy, and molecular collision phenomena.

Fall, 3 credits, ABCF grading

CHE 522 Molecular Spectroscopy

A detailed description of the theory and practice of molecular spectroscopy. Topics include the interaction of molecules with electromagnetic radiation and the time evolution of molecular energy states.

Spring, 3 credits, ABCF grading

CHE 523 Chemical Thermodynamics

A rigorous development of the fundamentals of thermodynamics and its application to a number of systems of interest to chemists, such as electrochemical cells, gases, and homogeneous and heterogeneous equilibrium. An introduction to statistical mechanics will also be included.

Fall, 3 credits, ABCF grading

CHE 524 Magnetic Resonance

This course provides an introduction to the fundamental quantum mechanics of the magnetism of spin-1/2 (and higher) particles. It includes a study of the Bloch equations (the responses of the magnetism to continuous-wave and pulsed irradiation) and a discussion of the experimental hardware and techniques commonly employed. Topics covered include the basics of the spin Hamiltonian (chemical shifts, J, dipolar, and quadrupolar couplings), dynamics and relaxation 1-D spectroscopy (spin and chemical exchange, lineshapes, spin echos, etc.), 2-D spectroscopy (homonuclear and heteronuclear correlation), techniques for studies of solids and liquid crystals (magic angle spinning, cross polarization, quadrupolar echo), and the principles of magnetic resonance imaging. Applications to the biological and material sciences, as well as chemical problems, will be discussed.

Spring, alternate years, 3 credits, ABCF grading

CHE 525 Theoretical Chemistry

This course stresses the physical theory underlying chemical phenomena. Special emphasis is given to advanced topics in electronic structure theory, molecular dynamics, condensed matter and surfaces, many-body and quantum ensemble theory, and the interaction of light and molecules.

*Prerequisite: CHE 521
3 credits, ABCF grading*

CHE 528 Statistical Mechanics

Statistical theory of equilibrium systems and rate processes. Ensemble theory, spatial and time correlation functions. Model systems and methods of estimating their properties. Designed to enable the student to use the current literature dealing with application of statistical mechanics to problems in chemistry. *Spring, 3 credits, ABCF grading*

CHE 530 Physical Chemistry of Macromolecules

An investigation of the gross and fine structures of macromolecules and molecular aggregates in solution as revealed by hydrodynamic behavior (e.g., ultracentrifugation, viscosity), light scattering, spectroscopic properties (e.g., ultraviolet hypochromism, circular dichromism, Raman, fluorescence, magnetic resonance spectra), and the thermodynamics and kinetics of interaction with small molecules and ions. Theory of conformation changes and phase transitions. *3 credits, ABCF grading*

CHE 531 Departmental Research Seminar

Meetings in which first-year graduate students learn about the research activities of the departmental faculty. *Fall, S/U grading*

CHE 532 Literature Seminar

Students select and discuss topics from the current literature. *Spring, ABCF grading*

CHE 541 Biomolecular Structure and Analysis

The structures of biological macromolecules and the relationship of their structure to biological function are described. Methodology employed to study macromolecules is also discussed. Topics include chemical and physical properties of cell and tissue constituents, including carbohydrates, lipids, nucleic acids, proteins and peptides. *Prerequisite: Strong foundation in physical and organic chemistry*
Fall, 3 credits, ABCF grading

CHE 542 Chemical Biology

The reactivity and physiological function of biological macromolecules and their cofactors are described at the chemical biochemical level. The emphasis of this course reflects recent advances in chemical biology. Possible topics include catalysts, reaction mechanisms, correlation between three-dimensional structure and reactivity, receptor-ligand interactions in extracellular and intracellular signaling, protein folding in vitro and in vivo. *Spring, 3 credits, ABCF grading*

CHE 589 Directed Study

Subject matter varies according to needs of student. *Fall and spring, 0-12 credits, ABCF grading*
May be repeated for credit

CHE 590 M.S. Term Paper

Independent study leading to a term paper on a selected topic in chemistry, chemical applications, or chemical pedagogy. *Fall and spring, 3 credits, ABCF grading*

CHE 591 Chemistry in Society

Includes current trends in chemical research and the influence of chemistry in areas such as the environment and technology. Topics of local interest and the conflicting demands placed on technology will be integrated into the course. *3 credits, ABCF grading*

CHE 593 Chemical Demonstrations

The design and implementation of demonstrations to illustrate modern concepts of chemistry. *3 credits, ABCF grading*

CHE 599 Research

Fall and spring, 1-12 credits, S/U grading

CHE 602 Special Topics in Physical Organic Chemistry

The subject matter varies depending on interests of students and staff. It may cover such areas as photochemistry, theoretical organic chemistry, and the chemistry of unstable intermediates; the emphasis is on fundamental considerations and recent developments. *1-12 credits, ABCF grading*
May be repeated for credit

CHE 603 Special Topics in Bioorganic Chemistry

The subject matter varies depending on interests of students and faculty. Possible topics include asymmetric synthesis and natural product synthesis. *Fall, 1-3 credits, ABCF grading*
May be repeated for credit

CHE 606 Special Topics in Synthetic Chemistry

May be repeated for credit

CHE 610 Practicum in Teaching

Practice instruction in chemistry at the undergraduate level, carried out under faculty orientation and supervision. A minimum of two semesters of CHE 610 or 611 is required of all candidates for graduate research degrees in chemistry, unless explicitly waived by the chairperson. *Fall and spring, 1-3 credits, ABCF grading*
May be repeated for credit

CHE 611 Practicum in Teaching

Practice instruction in chemistry at the undergraduate level, carried out under faculty orientation and supervision. A minimum of two semesters of CHE 610 or 611 is required of all candidates for graduate research degrees in chemistry, unless explicitly waived by the chairperson. *Fall and spring, ABCF grading*
May be repeated once for credit

CHE 619 Critical Readings of Current Topics in Chemistry

Recent research papers from the literature will be analyzed in depth. These papers may originate from the inorganic, organic, physical, and/or biochemical literature. The exact topic of the course is announced in advance. *1-3 credits, ABCF grading*
May be repeated for credit

CHE 625 Molecular Structure and Crystallography

Experimental methods in the determination of molecular structure. The emphasis is on the determination of structure in the solid state, particularly by X-ray crystallography. Students complete a single-crystal molecular structure determination using modern diffractometer techniques. *3 credits, ABCF grading*

CHE 641 Organometallic Chemistry

A systematic presentation of the chemistry of organometallic compounds, particularly those of the transition metals. Topics include structure, bonding, reaction mechanisms, synthesis, and applications in catalysis and organic synthesis. *3 credits, ABCF grading*

CHE 682 Special Topics in Inorganic Chemistry

Subject matter varies, depending on interests of students and staff, but covers recent developments in inorganic chemistry. *0-3 credits, ABCF grading*
May be repeated for credit

CHE 683 Special Topics in Physical Chemistry

Subject matter varies, depending on interests of students and staff, but covers recent developments and advanced topics in physical chemistry. *3 credits, ABCF grading*
May be repeated for credit

CHE 690 Internship in Dissertation-Related Research

Supervised curricular training in dissertation-related research. *Fall and spring, 1-3 credits, S/U grading*

CHE 693 Physical Chemistry Seminar

Fall and spring, 0-12 credits, S/U grading
May be repeated for credit

CHE 694 Biological Chemistry Seminar

Fall and spring, 0-12 credits, S/U grading
May be repeated for credit

CHE 695 Inorganic Chemistry Seminar

Fall and spring, 0-12 credits, S/U grading
May be repeated for credit

CHE 696 Organic Chemistry Seminar

Fall and spring, 0-12 credits, S/U grading
May be repeated for credit

CHE 698 Colloquium

Fall and spring, 0-12 credits, S/U grading
May be repeated for credit

CHE 699 Dissertation Research on Campus

Prerequisite: Must be advanced to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

CHE 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

CHE 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

CHE 800 Summer Research

May be repeated for credit



Comparative Literature (CLG)

Chairperson: Robert Harvey, Humanities Building 2048 (631) 632-7460

Graduate Program Director: Ira Livingston, Humanities Building 2124 (631) 632-9475

Graduate Secretary: Mary Moran-Luba, Humanities Building 2049 (631) 632-7456

Degrees awarded: M.A. and Ph.D. in Comparative Literature

The Department of Comparative Literary and Cultural Studies, which is part of the College of Arts and Sciences, offers the Graduate Program in Comparative Literature leading to the M.A. and Ph.D. degrees in Comparative Literature.

Admission

To be considered for admission to graduate studies in comparative literature, all applicants must hold a baccalaureate degree from an accredited college or university with a suitable overall grade point average and with a high average in a major field appropriate to study in comparative literature. Applicants should also have a good command of at least one, and preferably two, foreign languages. In addition, they must submit the following by January 15:

1. A B.A. or M.A. degree from a recognized institution in a suitable area of study;

2. An official graduate application form, including 3 letters of recommendation;

3. Two official copies of all previous college transcripts. (Transcripts of both undergraduate and graduate work must be submitted. If a student attended a junior college whose credits and grades are not listed on the senior college transcript, a separate junior college transcript is required.) International students must submit certified English translations of transcripts;

4. For international students, proficiency in English as demonstrated by a minimum TOEFL score of 550 (paper) or 213 (computer) or an IELTS total score of 6.5. In order to teach, any graduate student whose native language is not English must score 55 or above on the TSE or SPEAK test or obtain a score of 7.0 or better in the speaking component of the IELTS test. The Web site for ETS (TOEFL and GRE) is www.ets.org;

5. An appropriate score on the Graduate Record Examination General Test (GRE), Institution Code 2548, Department Code 2902;

6. Two term papers or other writing samples in literature or a related field;

7. For international students, a foreign student financial affidavit;

8. For international students, a standard cassette demonstrating ability to speak English;

9. An application fee of \$60.

Admission to the M.A. Program

Applicants to the graduate program in comparative literature are required to fulfill the minimum admission requirements of the Graduate School. In addition, applicants are ordinarily required to hold a bachelor's degree in an appropriate field from a recognized institution. Furthermore, applicants to the graduate program in comparative literature are expected to demonstrate competence in one foreign language as well as in English. Adequate reading knowledge of a second foreign language is highly desirable.

Any deficiencies in these requirements shall not automatically bar admission, but it is understood that inadequacies in undergraduate preparation will normally require the student to take additional work, the amount to be determined by the graduate program committee and not to be used to fulfill any specific M.A. degree requirements.

In all cases, admission is by action of the graduate program committee of the department under guidelines established by the Graduate School. Applicants are admitted on the basis of their total records, and no predetermined quantitative criteria, by themselves ensure a positive or a negative decision.

Admission to the Ph.D. Program

Stony Brook's doctoral program in comparative literature emphasizes developments in contemporary interpretive theory that have transformed disciplinary identities. It understands its "comparative" mission not only to encourage a global perspective on literature beyond narrow linguistic and cultural boundaries,

but also to seek alternatives to established approaches to literary study. The program's faculty and students work closely with members of other programs in the humanities, arts, and social sciences in a collaborative effort to examine the role of literary expression as related to other forms of human activity. Students supplement their core study in comparative literature by designing individual programs with strong links to related fields. While providing students with the techniques required for advanced literary analysis, the program seeks to provide full appreciation of how those techniques interact with different modes of scholarly inquiry.

As an institution, Stony Brook is committed to increasing the opportunities for interdisciplinary activity crucial to the doctoral program in comparative literature. The University's Humanities Institute is the most visible expression of a broad university commitment to bringing diverse scholars together for a common intellectual enterprise.

Applicants holding the M.A. degree in Comparative Literature from the graduate program in Comparative Literary and Cultural Studies from Stony Brook may, upon the advice of the graduate program committee, be directly admitted to the Ph.D. program. Other applicants will be admitted to the program after review of their qualifications.

Faculty

Professors

Charnon-Deutsch, Lou¹, Ph.D., 1978, University of Chicago: 18th- and 19th-century peninsular literature; feminist theory.

Chittick, William C., Ph.D., 1973, Tehran University, Iran: Sufism; Islamic thought; Persian literature; Arabic literature; Islam in India; comparative mysticism.

De la Campa, Román², Ph.D., 1977, University of Minnesota: Latin American literature; Latin and Caribbean cultural studies; contemporary theories of criticism.

Gabbard, Krin, Ph.D., 1979, Indiana University: Film theory and history; jazz; cultural studies; psychoanalytic approaches to the arts.

Harvey, Robert³, *Chairperson*. Ph.D., 1988, University of California, Berkeley: 20th-century and contemporary literature in French and English; interpenetrations of philosophy and literature; critical theory; film.

Kaplan, E. Ann, Ph.D., 1970, Rutgers University: Contemporary theory; cultural studies (women in film, film noir, popular culture, television); film and literary theory.

Miller, Clyde Lee, Ph.D., 1974, Yale University: History of philosophy.

Petrey, Sandy, Ph.D., 1966, Yale University: 19th-century fiction; theories of the novel; contemporary criticism.

Rzhevsky, Nicholas, Ph.D., 1972, Princeton University: 19th- and 20th-century Russian literature and culture; ideology; literature and theatre.

Silverman, Hugh J.⁴, Ph.D., 1973, Stanford University: Contemporary literary/art/film/cultural theory; Continental philosophy and criticism; Interdisciplinary studies in philosophy, literature, and culture; history of literary and aesthetic theory; the philosophical essay.

Vasvari, Louise O., Ph.D., 1969, University of California, Berkeley: Medieval literature; literature and folklore; literature and linguistics; translation theory; Romance philology; literature and sexuality; art and literature.

Associate Professors

Kalinowska-Blackwood, Izabela, Ph.D., Yale University: Russian and Polish literature; culture and film.

Livingston, Ira, Ph.D., 1990, Stanford University: Poetics; cultural theory; Romanticism; science studies.

Murata, Sachiko, Ph.D., 1971, Tehran University, Iran: Islamic law; Persian literature; feminine spirituality; Islamic thought; Japanese religions; Confucianism and Taoism.

Rashkow, Ilona N., Ph.D., 1988, University of Maryland: Modern theoretical approaches to the Hebrew Bible; Renaissance literature; comparative literature methodology; translation theory; feminist literary criticism.

Rawlinson, Mary C.⁵, Ph.D., 1978, Northwestern University: Aesthetics; literature and philosophy; Proust; Hegel; mystery and detective fiction.

Reich, Jacqueline, Ph.D., 1994, University of California, Berkeley: Italian cinema; film theory; gender studies.

Assistant Professors

Chi, Robert, Ph.D., 2001, Harvard University: Modern Chinese literature, cinema, and culture; history and memory.

Visiting Assistant Professor

Coller, Alexandra, Ph.D., 2005, New York University: Italian Studies.

Perez Melgosa, Adrián, Ph.D., 1995, University of Rochester: Cinema and the novel in the Americas; cultural studies.

Adjunct Professor

Bottigheimer, Ruth B., D.A., 1981, Stony Brook University: Tale collections; children's literature; fairy tales; sociocultural analysis of literature.

Number of teaching, graduate, and research assistants, fall 2005: 16

1) *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990*

2) *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1998*

3) *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1996*

4) *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1977*

5) *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1994*

Degree Requirements Requirements for the M.A. Degree

In addition to the minimum requirements of the Graduate School, the following are required:

A. Course Requirements

The minimum course requirement for the M.A. degree is 30 graduate credit hours. An M.A. candidate is expected to take:

1. CLT 501 Comparative Literature Methodology
2. CLT 510 History of Literary Theory—Part I
3. Three CLT courses numbered 600 and higher

The remaining courses may be distributed among graduate offerings in comparative literature, English, foreign languages, philosophy, history, art criticism, theatre, music, and other appropriate fields. A student must achieve a 3.5 overall grade point average for all graduate courses taken at Stony Brook to receive a degree.

B. First-Year Evaluation

In the middle of the student's second semester of graduate work, the graduate program director prepares a file for the student's first-year evaluation. It consists of (1) the student's grades, (2) letters from the professor in all of the student's classes, and, if the student is a teaching assistant, (3) a letter of evaluation from appropriate faculty, and (4) student evaluations. Students may submit any other relevant material such as a seminar paper or original essay. The graduate program committee will evaluate the dossier and decide

whether the student should be encouraged to continue in the program.

C. Satisfactory Progress Toward the M.A.

Because so many factors depend on satisfactory progress toward the degree, it is important for students to be aware of and monitor their own progress. The following define the minimum limits for satisfactory progress for full-time students:

1. Maintain a 3.5 average, with no course below B-, in each semester of graduate study, as well as complete all incomplete grades by the first deadline. Students who fail to fulfill these requirements in any semester will be automatically placed on probation during the following semester and will be subject to possible dismissal.

2. Receive an acceptable first-year evaluation in the spring semester of the first year of study.

D. Foreign Language Requirements

Entering students are expected to have a good command of one and preferably two foreign languages. Students must ultimately be competent in one major and one minor language (non-native speakers of English may offer English as one of the two languages). All students must have passed the language requirements before they are allowed to take the M.A. examination. To demonstrate competence in the major language, students must take for credit, and earn a grade of B or better in, at least one graduate or advanced undergraduate literature course conducted in the language (final papers may be written in English). Competence in the minor language can be demonstrated by (1) earning a grade of B or better in a graduate translation course or (2) passing a CLT examination to be taken with a dictionary. (For details, see the department handbook.)

E. M.A. Examination

The student will take a written master's examination in the second year of graduate study or submit a master's thesis. The exam measures the student's knowledge and mastery of literary theory and its history, familiarity with the major texts of world literature, and ability to compose a competent stylistic analysis of literary texts. The master's examination committee consists of three members of the faculty, at least two of

whom are members of the comparative literature graduate faculty. The student's advisor normally chairs the committee, and the other two members are chosen by the director of graduate studies in consultation with the student and his/her advisor.

Reading List for the Examination: The student, in consultation with the examination committee, prepares a list of works in each of the following three areas: (1) history of criticism from the Greeks to the present; (2) a literary genre; and 3) a literary period. The list for (1) is set. Each of the other reading lists will consist of 15 to 20 primary texts. (The number of required titles for the genre will be increased if the student chooses short works; whatever the genre, the reading required should approximate that imposed by 15 to 20 novels.) The list, signed by the student and all members of the examination committee, must be submitted to the director of graduate studies for approval by the graduate studies committee at least four weeks prior to the examination date.

The master's examination will consist of a one and a half hour oral exam at which at least two of the three members of the examination committee must be present.

Thesis Substitute for Master's Examination: Instead of taking the M.A. examination, students may substitute a thesis for the exam. The thesis must be on a substantive topic in comparative literature requiring original research. The student will form a committee of three faculty, at least two of whom must be from the comparative literature graduate faculty, who will supervise the project and give final approval. The student's committee and project proposal must be approved by the graduate studies committee prior to embarking on the thesis.

Requirements for the Ph.D. Degree

In addition to the minimum requirements of the Graduate School, the following are required:

A. Course Requirements

1. CLT 501 Comparative Literature Methodology
2. CLT 510 History of Literary Theory—Part I
3. Three CLT courses numbered 600 and higher

4. CLT 698 The Teaching Practicum

A minimum of 48 credits of graduate work is required for the Ph.D. Students who hold an M.A. in comparative literature or a related discipline can request that their transcripts be evaluated by the graduate program committee and may receive a maximum of 30 credits toward their Ph.D. All students seeking the Ph.D. must take the required courses listed above, unless the graduate program committee accepts comparable courses taken previously. All Ph.D. students must acquire a minimum of one semester of formal teaching experience (even if they are unsupported or are on a fellowship requiring no teaching duties) and must concurrently take the formal teaching practicum, CLT 698.

B. First-Year Evaluation

In the middle of the student's second semester of graduate work, the graduate program director prepares a file for the student's first-year evaluation. It consists of: (1) the student's grades, (2) letters from the professor in all of the student's classes, and, if the student is a teaching assistant, (3) a letter of evaluation from appropriate faculty, and (4) student evaluations. Students may submit any other relevant material such as a seminar paper or original essay. The graduate program committee will evaluate the dossier and decide whether the student should be encouraged to continue in the program.

C. Satisfactory Progress Toward the Ph.D.

In addition to requirements A through D, Ph.D. students must fulfill the following requirements:

1. Maintain at least a 3.5 average, with no course below B-, in each semester of graduate study. There is a one-year maximum limit on incompletes. A student may accumulate no more than two incomplete grades in any one semester or he/she will no longer be considered a Student in Good Standing, a prerequisite to continue in the program. As a result, the student will lose his or her T.A. line as well as face likely dismissal from the program;
2. Receive a satisfactory first-year evaluation in the spring semester of the first year of study;
3. Satisfy at least one language requirement in each year of residence

until all language requirements are met. All language requirements must be completed at least three months before the comprehensive examination;

4. Complete all core courses in the first two years of full-time study and all 48 credits for the Ph.D. in three years;

5. Take the comprehensive examination no later than one year after completion of coursework;

6. Submit a dissertation proposal in the semester following satisfactory completion of the comprehensive examination.

By rules of the Graduate School, students must satisfy all requirements for the Ph.D. within seven years after completing 24 credits of graduate work in the Stony Brook department in which they are registered. In rare instances, the Graduate School will entertain a petition to extend this time limit, provided it bears the endorsement of the department. The program may require evidence that the student is still properly prepared for completion of the degree. In particular, the student may be required to pass the comprehensive examination again in order to be permitted to continue work.

D. Foreign Language Requirements

Ph.D. students may choose to demonstrate competence in either two major foreign languages or one major and two minor languages. To demonstrate competence in the major language, students must take for credit and earn a grade of B or better in at least one graduate or advanced undergraduate literature course conducted in the language (final papers may be written in English). Competence in the minor languages can be demonstrated by: 1) earning a grade of B or better in a graduate translation course or 2) passing a CLT examination to be taken with a dictionary. (For details, see the department handbook.)

E. Comprehensive Examination

Full-time students who are candidates for the Ph.D. take an oral comprehensive examination no more than one year after completing their coursework. All language requirements must be completed at least three months before the comprehensive examination. Each student will have a committee of four faculty members who can examine the candidate in one or more areas of the

comprehensive examination, and who will assist the candidate in preparing a reading list for the examination. The examination consists of four parts: literary theory and its history, a literary genre, a period of literary history, and a special area of comparative nature related to the student's plan for the dissertation. Students who have passed their Ph.D. oral comprehensive will be deemed to have passed the equivalent of the master's exam and be granted a M.A. degree unless they already have a master's degree in comparative literature from another institution. The student must file appropriate papers with the department. (For more details, see the department handbook.)

F. Dissertation

The dissertation represents the culmination of the student's degree program and should be a serious contribution to scholarship. Candidates choose their dissertation director and the dissertation committee in consultation with the chairperson and the graduate program director. A Ph.D. dissertation proposal should be presented to the dissertation director within three months after completion of the comprehensive examination. Early involvement of all members of the committee in the ongoing research and writing is strongly recommended. The student's formal defense of the dissertation is open to all members of the University community.

G. Teaching Assistantships

All students are asked to acquire some experience in teaching. Guidelines permit a graduate student to be supported as a teaching assistant (TA) for a maximum of four years. Graduate students in comparative literature have the opportunity to teach a wide variety of courses: traditionally, they have taught foreign language courses, English composition, interdisciplinary courses offered in the undergraduate humanities program, and entry-level comparative literature courses.

During their first year, Ph.D. students will normally be placed as teaching assistants in CLT lecture courses. During their second and third years, students will most commonly teach as instructors in the Writing Program, and during their fourth year, as independent instructors of CLT courses. Admitted students who would prefer a Writing Program placement

during their first year should notify the department immediately upon admission into the Ph.D. program. While placements will vary according to student and program needs and constraints, every effort will be made to provide each student with the available range of teaching experiences.

H. Additional Information

A Handbook for Graduate Studies in Comparative Literature includes more extensive information on comparative literature at Stony Brook. A copy is available at the Comparative Literature Office. The handbook also can be requested by mail and can be accessed at www.stonybrook.edu/complit/new/index.html.

Courses

CLT 501 Comparative Literature Methodology

An introduction to the discipline of Comparative Literature, its history, methods, and problems. Stress is given to the interrelations of literature with other disciplines, as well as to questions involving subjects such as canon formation, genre, and periodization.
3 credits, ABCF grading

CLT 510 History of Literary Theory—Part I

A history of Literary Theory from classical Greece to the Enlightenment.
3 credits, ABCF grading

CLT 511 History of Literary Theory—Part II

A history of Literary Theory from the Enlightenment to the present.
3 credits, ABCF grading

CLT 597 Directed Readings for M.A. Students

May be repeated for credit

CLT 599 Independent Study

May be repeated for credit

CLT 600 Seminar in Stylistics

Changing topics in the study of stylistic and structural elements of the literary text.
3 credits, ABCF grading
May be repeated for credit

CLT 601 Seminar in Literary Theory

Changing topics in the specialized examinations of recent or historical trends such as semiotics, Marxism, reader-response, psychoanalysis, hermeneutics, deconstruction.
3 credits, ABCF grading
May be repeated for credit

CLT 602 Interdisciplinary Seminar

Specific problems in the relations between literature and other disciplines.
3 credits, ABCF grading
May be repeated for credit

CLT 603 Comparative Studies in Literary History

Changing topics in the study of literary periods and styles.

3 credits, ABCF grading
May be repeated for credit

CLT 604 Comparative Studies in Genre

Changing topics in the study of the history and theory of literary genres.
3 credits, ABCF grading
May be repeated for credit

CLT 607 Major Authors in Comparative Context

Critical and comparative examination of two or more major figures from different literary traditions.
3 credits, ABCF grading
May be repeated for credit

CLT 608 Cross-Cultural Perspectives

Key topics in genre, literary criticism, and methodology from a cross-cultural perspective. Emphasis will be placed on an examination of differences as well as similarities. Presuppositions of specific literary traditions will be questioned within the broader perspectives of philosophical and religious valences.
3 credits, ABCF grading

CLT 609 Seminar in Cultural Studies

Changing topics in the study of film, video, music, and popular culture. Specific works are studied within their historical and cultural contexts and approached through methods developed in contemporary theory.
3 credits, ABCF grading
May be repeated for credit

CLT 610 History and Institutions of Cultural Studies

This course examines the institutional origins and historical contexts of cultural studies by focusing on the practical activity of intellectuals working in collective contexts.
3 credits, ABCF grading
May be repeated for credit

CLT 690 Directed Readings for Doctoral Candidates

Fall and spring, 1-12 credits, S/U grading
May be repeated for credit

CLT 698 Practicum in Teaching

The course is divided into two parts: one half is normally given in the fall, one in the spring. The first part deals primarily with matters of pedagogy. The second part is designed to help students plan their own undergraduate courses. The practicum is required of all students during their first year.
1-3 credits, S/U grading
May be repeated once for credit

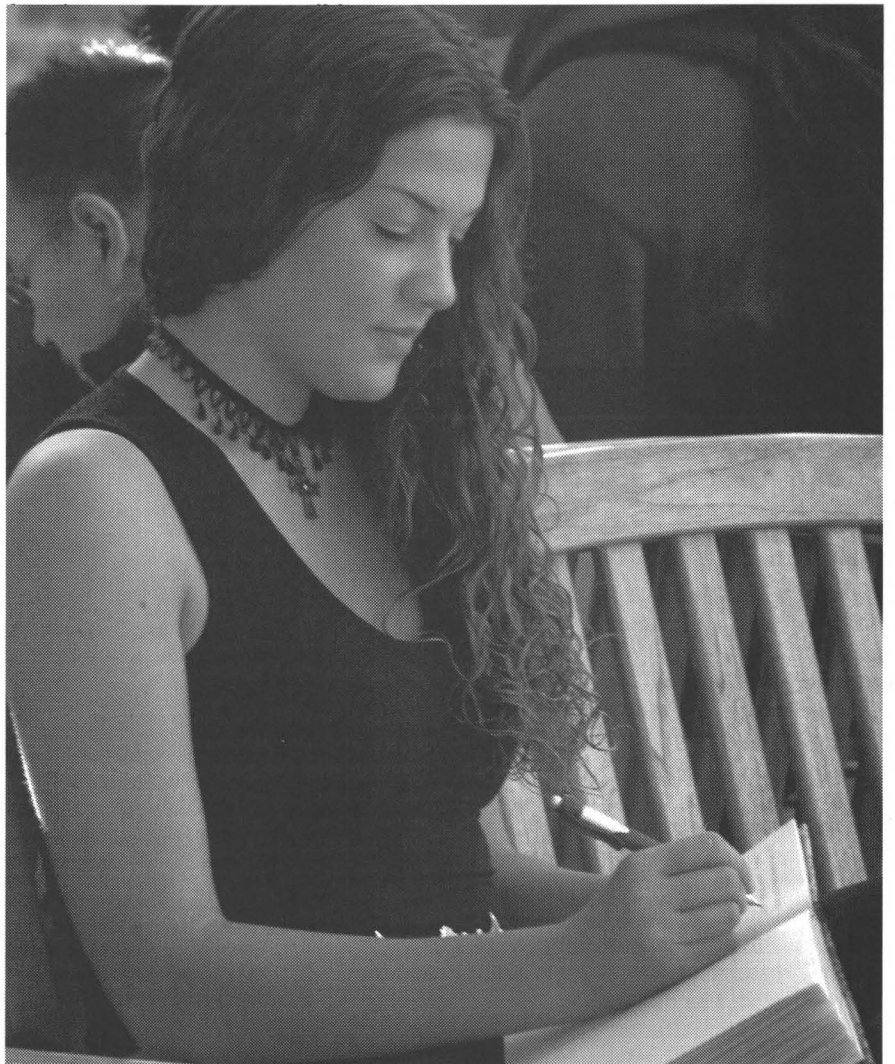
CLT 699 Dissertation Research on Campus

Prerequisite: Advancement to candidacy (G5); a portion of dissertation research must take place on SBU campus
Fall, spring, and summer, 1-12 credits, S/U grading
May be repeated for credit

CLT 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will

*take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor
Fall, spring, and summer, 1-9 credits,
S/U grading
May be repeated for credit*



Computer Science (CSE)

Chairperson: Arie Kaufman, Computer Science Building 2431 (631) 632-8470

Graduate Program Director for M.S. and Ph.D. programs in Computer Science: Michael Kifer, Computer Science Building 1413 (631) 632-8459

Graduate Program Advisor for M.S. and Ph.D. programs in Computer Science: I.V. Ramakrishnan, Computer Science Building 1431 (631) 632-8451

Graduate Program Administrator for M.S. and Ph.D. in Computer Science: Dolores Ambrose, Computer Science Building 1440 (631) 632-8462

Graduate Program Director for M.S. program in Information Systems Engineering (MSIS): Robert F. Kelly, Computer Science Building 2427 (631) 632-7543

Staff Assistant for MSIS: Marion Mastauskas, 127 Engineering Building (631) 632-8760

Degrees awarded: M.S. in Computer Science; M.S. in Information Systems Engineering; Ph.D. in Computer Science

The Department of Computer Science offers an M.S. and a Ph.D. in Computer Science, and an M.S. in Information Systems Engineering.

The M.S. program in Computer Science is designed primarily to train students with professional goals in business, industry, or government, requiring a detailed knowledge of computer science concepts and applications. The program concentrates primarily on applied computer science, emphasizing software development, programming, computer systems, and applications. Each student is given the experience of working on a large-scale software or hardware development project involving analysis, design, evaluation, and implementation.

The Ph.D. program in Computer Science is for students interested in obtaining academic or research positions in colleges and universities or in government or commercial research laboratories. The program gives students a rigorous and thorough knowledge of a broad range of theoretical and practical research subject areas and develops the ability to recognize and pursue significant research in computer science. The first two years of graduate study are devoted to coursework. By the end of the second year the research phase of the student's graduate career should be underway, with participation in advanced study and preliminary research work. The final years of graduate study are devoted to dissertation research.

The primary areas of departmental research interests include, among others, computation theory, logic, algorithms, concurrency, databases, languages, artificial intelligence, image processing, graphics, operating systems, networking, and architecture.

Information in this Bulletin concerning the M.S. and Ph.D. programs in Computer Science is an abbreviated version of the Graduate Program Handbook found at www.cs.sunysb.edu/graduate/GraduateHandbook.html. Students must refer to the Handbook for further

details and up-to-date information. Additional information about the graduate program in computer science can be found on the department's Web site at www.cs.sunysb.edu.

The program for Masters of Science in Information Systems Engineering (MSIS) emphasizes the engineering and application aspects of Information Technology (IT). The program differs from a traditional Information Systems program in that it focuses on an engineering approach to IT. The curriculum of the program also emphasizes individual communications skills and team participation.

The MSIS degree program has distinct specialization tracks geared to different classes of IT employment. The curriculum, consisting of 30 credits of coursework, is designed to accommodate students from a wide variety of backgrounds. An Executive track, specially designed for full-time employees with working experience, facilitates the 30 credits to be completed with an evening/weekend schedule. Specialization tracks for the program include Systems Engineering, Telecommunications, and Software Engineering. The core component of the program consists of courses in programming; hardware; data management; analysis, modeling, and design; data communications and networking; and technology integration. Following the completion of the core requirements, students can specialize in one of the tracks by choosing appropriate electives. Students are expected to solve real world problems by applying and integrating newly acquired skills. The integration requirement can be satisfied at any time after the completion of the core courses.

Computing Environment

The Computer Science Department is composed of a number of special interest labs (Visualization, Experimental Systems, Logic Modeling, Security Systems, File systems, Human Interface with Computers, Wireless Networking and Multimedia) connected by a multi-gigabyte backbone.

Typical systems are PCs running FreeBSD, Linux, MS Windows, and Sun Sparc systems. There are numerous multiprocessor/large memory systems including a graphics cluster of Linux and MS Windows PCs. General access labs provide UNIX and MS Windows systems, and each office desktop is equipped with a workstation. The department maintains its own dial-up service and wireless network. The Stony Brook campus is connected to the Internet via multiple OC3 connections.

Library

The Computer Science Library, located within the Computer Science Building, provides a pleasant environment for serious study and has a collection of more than 15,000 books, conference proceedings, technical reports, and 350 journal titles. In addition, the Library has an impressive digital collection of electronic books, journals, and databases that is accessible on-site as well as remotely. A full range of library services is available, including research assistance, inter-library loan, and STARS, the Stony Brook Automated Retrieval System, which provides online access to the catalogs of all campus libraries from any workstation as well as access to other electronic collections. Students are encouraged to make free use of these services and to seek the assistance of the librarian in the course of their research.

Admission to the M.S. and Ph.D. in Computer Science

Admission to the M.S. and Ph.D. programs are handled separately by the departmental admissions committee. The requirements for admission to graduate study in computer science include:

A. Bachelor's Degree: A bachelor's degree, usually in a science or engineering discipline or in mathematics, with a grade point average of at least B (3.0/4.0) in all undergraduate coursework, and in

the science, mathematics, and engineering courses;

B. Basic Mathematics: Two semesters of college-level calculus, plus a course in linear algebra; also desirable is a course in either probability theory or probability and statistics;

C. Minimal Background in Computer Science: As a measure of that background, the student must satisfy five of the following proficiency requirements:

1. Theory of Computation: CSE 303 or CSE 540
2. Algorithms: CSE 373 or CSE 548
3. Language/Compilers: CSE 304, CSE 307, CSE 504, or CSE 526
4. Architecture: CSE 320 or CSE 502
5. Databases: CSE 305 or CSE 532
6. Operating Systems: CSE 306 or CSE 506
7. Networks or Graphics: CSE 310, CSE 533, CSE 328, or CSE 528

D. Acceptance by the Computer Science Department and Graduate School;

E. All applicants to the M.S. or Ph.D. program must submit Graduate Record Examination (GRE) scores for the general aptitude tests. Applicants are encouraged to submit GRE test scores for the advanced examination in Computer Science as well. More information on the application process can be found at www.cs.sunysb.edu/graduate.

Admission to the M.S. in Information Systems Engineering

Admission to the regular program is based on the following criteria:

A. A baccalaureate degree from an accredited applied science or engineering program with a minimum GPA of 2.75. (Provisional admissions may be granted in exceptional cases if the GPA is less than 2.75 but above 2.25 provided it is approved by the Graduate School at the recommendation from the IS Graduate Committee. Provisionally admitted students are required to take at least two courses in the first semester and receive a B average to continue in the program.);

B. GRE scores (provisionally admitted students without GRE scores must take the examination within the first semester of their registration);

C. A minimum score of 550 in TOEFL for applicants whose first or native language is not English;

D. Letters of recommendation;

E. Other documents as described in the Graduate Bulletin.

Admission to the Executive track is based on the following criteria:

A. A baccalaureate degree from an accredited applied science or engineering program, with a minimum GPA of 2.75;

B. IT-related work experience;

C. Details of work experience, responsibilities/duties, and career goals;

D. A minimum score of 550 in TOEFL if the baccalaureate degree is from a foreign institution;

E. Letters of recommendation from current and previous employers and teachers.

For admission to the M.S. in Information Systems Engineering program, all applicants are required to submit completed applications to the Graduate School through the College of Engineering and Applied Sciences, with the following documents: (a) an official graduate application form specially designed for applicants to the proposed program with non-refundable application fee as prescribed by the University, (b) three letters of recommendation, (c) two official copies of all previous transcripts (if in a foreign language, English translation is required together with the originals), (d) details of the employment history and duties/responsibilities, (e) scores of GRE, (f) scores of TOEFL in case of applicants for whom English is not the first language, and (g) a personal statement describing the previous accomplishments, career objectives, and future goals. Students in the Executive track may be waived of GRE requirements with the approval of Graduate School.

All applications submitted in time are reviewed by the Graduate Committee and applicants who meet the requirements are selected on a competitive basis. Applications are scored on a scale reflecting academic achievements, GRE scores, work experience, and career goals. Preference is given to the applicants

with relevant experience. Special considerations are made for women, minorities, and physically challenged applicants provided they meet the minimum admission criteria. Preference also is given first to New York residents and second to U.S. citizens and permanent residents.

Applicants for the Executive Track are considered in a separate pool. Their applications must contain a support letter from the employer describing the length of service in the company, the responsibilities and authority, evaluation of the job performance, and how the participation in the Executive track by the applicant benefits the company.

Students of high caliber seeking to enter the program with an incomplete set of undergraduate courses or not having enough prerequisites are required to complete a predetermined number of foundation courses (normally consisting of nine credits), including Information Systems and business: Fundamentals of Information Systems; Information Technology Hardware and Software; Programming, Data, and Object Structures.

Faculty

Professors

Bachmair, Leo, Ph.D., 1987, University of Illinois, Urbana-Champaign: Computational logic; automated deduction; symbolic computation.

Chiueh, Tzi-cker, Ph.D., 1992, University of California, Berkeley: Processor architecture; parallel I/O; high-speed networks; compression.

Kaufman, Arie, *Chairperson*. Ph.D., 1977, Ben-Gurion University: Computer graphics; visualization; user interfaces; computer architecture; virtual reality; multimedia.

Kifer, Michael, *Graduate Program Director*. Ph.D., 1984, Hebrew University of Jerusalem: Database systems; logic programming; knowledge representation; Web information systems; workflow management systems.

Ko, Ker-I, Ph.D., 1979, Ohio State University: Computational complexity; theory of computation; computational learning theory.

Liang, Jerome, Ph.D., 1987, City University of New York: Medical imaging; image processing.

Mitchell, Joseph, Ph.D., 1986, Stanford University: Operations research; computational geometry; combinatorial optimization.

Ramakrishnan, I.V., *Graduate Program Advisor*. Ph.D., 1983, University of Texas, Austin: Automated reasoning; technologies for Web-based computing.

Sekar, R.C., Ph.D., 1991, Stony Brook University: Computer security; distributed systems; programming languages/software engineering.

Skiena, Steven, Ph.D., 1988, University of Illinois, Urbana-Champaign: Computational biology; combinatorial algorithms; combinatorial computing environments; data structures.

Smolka, Scott A., Ph.D., 1984, Brown University: Computer-aided verification of safety-critical systems; computer system security.

Stark, Eugene, Ph.D., 1984, Massachusetts Institute of Technology: Programming language semantics; theory of concurrency; formal methods; operating systems.

Warren, David S., Ph.D., 1979, University of Michigan: Logic programming; database systems; knowledge representation; natural language and logic.

Wittie, Larry D., Ph.D., 1973, University of Wisconsin: Computer architecture; massively parallel computation; simulation of memory and attention to mammal brains.

Yang, Yuanyuan, Ph.D., 1992, Johns Hopkins University: Parallel and distributed computing systems; high speed networks; multicast communication; optical networks; high performance computer architecture; computer algorithms; fault tolerant computing.

Associate Professors

Arkin, Esther, Ph.D., 1986, Stanford University: Combinatorial optimization; network flows; computational geometry.

Badr, Hussein G., Ph.D., 1981, Pennsylvania State University: Computer communication networks and protocols; performance evaluation; modeling and analysis.

Bender, Michael, Ph.D., 1998, Harvard University: Algorithms; scheduling; data structures; cache and I/O-efficient computing; parallel computing.

Brennan, Susan, Ph.D., 1990, Stanford University: Cognitive psychology; linguistics; human-computer interaction.

Das, Samir, Ph.D., 1994, Georgia Institute of Technology: Mobile/wireless networking; ad hoc and sensor networks; parallel discrete-event simulation; performance evaluation.

Liu, Yanhong Annie, Ph.D., 1996, Cornell University: Programming languages; compilers; software systems.

Mueller, Klaus, Ph.D., 1998, Ohio State University: Computer graphics; visualization; projector-based graphics; augmented reality; virtual reality; medical imaging face recognition; GPU-acceleration of general purpose computing; visual data mining; functional brain analysis.

Qin, Hong, Ph.D., 1995, University of Toronto, Canada: Computer graphics; geometric and physics-based modeling; computer aided design; computer animation and simulation; scientific computing and visualization; virtual environments; computational vision; medical imaging; human-computer interaction; robotics.

Ramakrishnan, C.R., Ph.D., 1995, Stony Brook University: Formal verification of concurrent systems; logic programming; computer security.

Stoller, Scott, Ph.D., 1997, Cornell University: Distributed systems; software testing and verification; program analysis and optimization.

Wasilewska, Anita, Ph.D., 1975, Warsaw University: Logic; knowledge representation; artificial intelligence.

Zelinsky, Gregory J., Ph.D., 1994, Brown University: Visual search; visual working memory; object detection and recognition; visual attention and eye movements; scene perception and representation.

Assistant Professors

Ashikhmin, Michael, Ph.D., 2001, University of Utah: Computer graphics, including fundamentals, rendering algorithms, surface appearance, human perception, physics-based modeling, image synthesis.

Gao, Jie, Ph.D., 2004, Stanford University: Algorithms; ad hoc communication and sensor networks; computational geometry.

Grosu, Radu, Ph.D., 1994, Technical University of Munich, Germany: Model-based design and verification of embedded software systems; model checking; abstract interpretation; logic and automata theory; type theory; computational models in systems biology; applied formal methods; software and systems engineering.

Gu, Xianfeng, Ph.D., 2004, Harvard University: Computer graphics; computer vision; medical imaging; computational conformal geometry; global differential geometry; harmonic analysis; computational algebraic topology; computational optics; biometrics.

Gupta, Himanshu, Ph.D., 1999, Stanford University: Databases; data mining; data warehousing.

Johnson, Robert, Ph.D., 2005, University of California, Berkeley: Software security; system and network security; cryptography; digital rights management; operating systems; networks; algorithm design and analysis.

Mohr, Alexander, Ph.D., 2002, University of Washington: Algorithms; data compression; networks.

Rizzo, Robert, Ph.D., 2001, Yale University: Computational biology.

Samaras, Dimitris, Ph.D., 2000, University of Pennsylvania: Computer vision; computer graphics; medical imaging; animation and simulation; image-based rendering; physics-based modeling.

Sion, Radu, Ph.D., 2004, Purdue University: Data security and privacy in distributed networked environments.

Stent, Amanda, Ph.D., 2001, University of Rochester: Natural language processing.

Vasilescu, M. Alex O., 2005, University of Toronto: Computer vision; computer graphics; tensor algebra; physics-based modeling; machine learning.

Zadok, Erez, Ph.D., 2000, Columbia University: Operating systems; file systems; storage; networking; software engineering; security.

Affiliated Faculty for Program in Information Systems Engineering

Chiueh, Tzi-cker, Computer Science

Doboli, Alex, Electrical and Computer Engineering

Djuric, Petar, Electrical and Computer Engineering

Donetski, Dmitri, Electrical and Computer Engineering

Feinberg, Eugene, Applied Mathematics

Huang, Peisen, Mechanical Engineering

Kao, Imin, Mechanical Engineering

Kaufman, Arie E., Computer Science

Kelly, Robert F., Computer Science

Lindquist, W. Brent, Applied Mathematics

Mujica-Parodi, Lilianne, Biomedical Engineering

Murray, John, Electrical and Computer Engineering

Robertazzi, Thomas G., Electrical and Computer Engineering

Teng, Tian-Lih, Technology and Society

Zhou, Rong, Computer Science

Executive Committee of Program in Information Systems Engineering

Djuric, Petar, Electrical and Computer Engineering

Kaufman, Arie E., Computer Science

Kelly, Robert F., Computer Science,

Lindquist, W. Brent, Applied Mathematics

Robertazzi, Thomas G., Electrical and Computer Engineering

Teng, Tian-Lih, Technology and Society

Zhou, Rong, Computer Science

Number of teaching, graduate, and research assistants, fall 2005: 160

Degree Requirements Requirements for the M.S. Degree in Computer Science

Students in the M.S. degree program choose between two options, the M.S. with thesis and the M.S. with project. The course requirements depend on the option chosen.

A. Registration

Students must register for at least one graduate credit in the semester in which the diploma is awarded.

B. Language Requirement

There is no foreign language requirement.

C. Course Requirements

Students are required to complete 31 graduate credits in the Computer Science Department. There are no

specific courses required other than a thesis or project, with the stipulation that the proficiency requirements must be satisfied. Students can take up to four credits of CSE 587 (at most two courses) to fill in missing proficiency requirements. All seven proficiency requirements must be satisfied by the time of M.S. certification. A list of graduate courses is provided in the course compendium at the end of this section.

D. Grade Point Average

To be certified for graduation a cumulative graduate grade point average of 3.0/4.0 or better is required.

E. No-Thesis Option

Students choosing the no thesis option are required to take the courses CSE 523/524, Laboratory in Computer Science. The two courses may not be taken in the same semester. These courses provide students with the experience of dealing with large-scale, computer-oriented problems such as those encountered in commercial, industrial, or research environments. Students taking CSE 523/524 may not use any CSE 599 (M.S. Thesis Research) credits toward their M.S. degree.

F. Thesis Option

A student choosing the thesis option must select a project (or thesis) advisor by the end of the second semester in the program. The role of the advisor is to guide the student through the M.S. studies, formulate a project or thesis topic, and supervise the student toward completion of the assigned task. The thesis must be approved by a departmental faculty committee of no less than three members appointed by the graduate program director. At the discretion of the committee, the student may be required to present a seminar on the topic of his or her thesis. A student registers for CSE 599 when writing a thesis. No more than nine credits of this course can be applied toward the 31 credits required for the M.S. degree.

G. Switching Between the M.S. and Ph.D. Programs

An M.S. student who wishes to advance to the Ph.D. program must take the qualifying examination. Regular applicants to the Ph.D. program will not be considered from current M.S. students. Please refer to the Graduate Program Handbook for more details.

Requirements for the M.S. Degree in Information Systems Engineering

To receive the M.S. in Information Systems Engineering degree the student must obtain a minimum of 3.0 overall GPA in the courses taken to satisfy the requirements of this program. In addition, the student must satisfy all other requirements of the Graduate School not mentioned here. Following are the specific requirements that must be met to obtain the degree:

Each student must complete a minimum of 30 credits of graduate course work, consistent with program guidelines.

Each student must complete 15 credits of core courses (Systems Engineering Principles, Quantitative Computer Architecture, Data Management, Analysis, Modeling, and Design, Data Communications and Networking).

A three-credit course covering an integration topic is required for all students (e.g., ISE511, CSE580, or CSE523).

The required courses total 18 credits, including the 15 credits of core courses and three credits of integration. A minimum of 12 credits of electives is required of all students, out of which nine credits must be taken in the area of specialization. In case of core courses waived for equivalent courses taken previously, the student must earn those credits through electives at Stony Brook University, bringing the total credits to a minimum of 30.

A maximum of six credits of graduate coursework can be transferred for the courses taken elsewhere provided these credits were not used by the previous institution to award a degree.

Each student is assigned an academic advisor who must approve the coursework, area of specialization and sequence of courses.

Curriculum for the Executive Track:

The executive track is designed primarily for the employees of one company (or a group of companies). This requirement is identical to the requirement of the standard program. The curriculum is common to all the students in the program and targeted to the interests of the sponsoring company (or companies).

Courses for the M.S. Degree in Information Systems Engineering

Information Systems Engineering (ESE)

ISE 503 Data Management

ISE 504 Analysis, Modeling and Design

ISE 506 Quantitative Computer Architecture

ISE 516 Systems Engineering Principles

ISE 517 Human Factors in Systems Engineering

Applied Mathematics and Statistics (AMS)

(A complete description of AMS courses below can be found at www.grad.sunysb.edu/academics/bulletin/Ams.pdf.)

AMS 507 Introduction to Probability

AMS 550 Operations Research: Stochastic Models

AMS 553 Simulation and Modeling

Biomedical Engineering (BME)

(A complete description of BME courses below can be found at www.bme.sunysb.edu/bme/grad/courses.html.)

BME 526 Biological Systems Engineering

Technology and Society (EMP/EST)

(A complete description of EMP courses below can be found at www.sunysb.edu/est/courses/graduate.html.)

EMP 518 Project Management

EST 530 Internet Electronic Commerce

EST 582 Systems Approach to Human-Machine Systems

Electrical and Computer Engineering (ESE)

(A complete description of ESE courses below can be found at www.ee.sunysb.edu/~www/grad/coursedescriptions_b.html.)

ESE 504 Performance and Evaluation of Communication and Computer Systems

ESE 505 Traffic Performance Analysis of Mobile, Wireless, and Personal Communication Systems

ESE 528 Communication Systems

ESE 546 Computer Communication Networks I

ESE 547 Digital Signal Processing

ESE 548 Computer Communication Networks II

Business Technology Management

(A complete description of BTM courses below can be found at www.grad.sunysb.edu/academics/bulletin/Bus.pdf.)

BTM 514 Quality Management and Quality Assurance

Computer Science (CSE)

(A complete description of CSE courses below can be found at www.cs.sunysb.edu/graduate/courses/.)

CSE 500 Patterns in Programming

CSE 506 Operating Systems

CSE 515 Introduction to Transaction Processing Systems

CSE 523 Introduction to Software Engineering and Project Planning I

CSE 524 Introduction to Software Engineering and Project Planning II

CSE 533 Computer Network Communications Protocols

CSE 536 Introduction to User-Interface Development

Requirements for the Ph.D. Degree in Computer Science

A. Residence

The student must complete two consecutive semesters of full-time graduate study. Full-time study is 12 credits per semester until 24 graduate credits have been earned. Students who have earned 24 graduate credits at another school may be assigned advanced status and are required to take only nine credits per semester for full-time status.

B. Qualifying Examination

Students must pass the written qualifying examination to demonstrate their ability to undertake the course of study leading to the Ph.D. degree. Qualifying examinations are given twice a year: in May (usually the week after the finals period) and in early January. Students must refer to www.cs.sunysb.edu/graduate/QualsHandbook.html for further details and up-to-date information on the qualifying examination. The following is a short summary of the contents of this examination.

The exam consists of three parts, three hours each, based on undergraduate material as described below. Undergraduate Stony Brook courses covering that material are listed in parentheses. An appropriate way for students who have already taken an undergraduate course in a particular area to prepare for the exam is to take a graduate course in that area. Questions test not just routine knowledge but also the student's ability to use that material in a creative way.

Theory and Mathematics:

Theory of Computation, Languages and Automata Analysis of Algorithms and Logic. The examination is based on the following courses: CSE 303, CSE 371, CSE 213, and CSE 373.

Software:

Programming Languages, Compilers, Databases, and Graphics. The examination is based on CSE 304, CSE 305, CSE 307, and CSE 328.

Systems:

Networks and Communications, Operating Systems, Computer Architecture, and Computer Organization. The examination is based on CSE 310, CSE 306, CSE 320, and CSE 220.

The results of the written examination will be communicated to each student individually following a meeting of the faculty, which evaluates the results of the examination along with the student's ability to do research and the likelihood of completing the program.

C. Course Requirements

In the first year, a student seeking the Ph.D. degree will normally register for a full-time load of courses selected in conjunction with an advisor in order to prepare for the qualifying examination. By the time of graduation, each student is required to accumulate at least 20 credits of full (regular lecture) courses, internship, special topics courses or seminars. At most five credits of seminars and internship can be included in the 20 credits required for graduation; generic courses such as CSE 593, CSE 587, CSE 600, CSE 698, and CSE 699 cannot be included. In addition, the following requirements should be noted:

M.S.-specific courses. Students in the Ph.D. program may not enroll in CSE 523/524 or CSE 599. These courses are specific to the M.S. program.

Ongoing research seminar. The student must register and complete two semesters of CSE 600. Credits earned in this course cannot be used toward the 20 credits required for the Ph.D. program.

Internship, CSE 696. At most two credits of Internship in Research can be counted toward the 20 credits required for the Ph.D. program.

Dissertation Research, CSE 699. The Dissertation Research course can be taken only by Ph.D. students who have been advanced to candidacy (have G5

status). Prior to the advancement, students conduct research and participate in projects by taking CSE 593:

Independent study. G4 students can register for up to nine credits of CSE 593 in any semester. G3 students can register for only up to three credits of CSE 593.

Teaching requirement. University policy requires that all doctoral students participate in an appropriately structured teaching practicum. This can be CSE 698 in conjunction with a T.A. in the first year.

D. Research Proficiency Examination (RPE)

The purpose of the Research Proficiency Examination is to ascertain the breadth and depth of the student's preparation to undertake a significant original research investigation.

By the end of the third semester since admission into the Ph.D. program, an RPE committee will have been formed for each student and an agreement reached on a research project. (M.S. students who were admitted to the Ph.D. program after passing the qualifying examination must form the RPE committee by the end of their first semester in the Ph.D. program.)

By the end of the fourth semester (at the latest), the student will take the RPE. (M.S. students who switched to Ph.D. must take the RPE by the end of their second semester in the Ph.D. program.)

Having passed both the qualifying examination and the RPE, the student is advanced to candidacy. This status, called G5, is conferred by the Dean of the Graduate School upon recommendation of the department. Note that unlike the change from G3 to G4, the change from G4 to G5 is not automatic—the student must request to be advanced to candidacy by notifying the Computer Science Graduate Secretary. Students must advance to candidacy at least one year before defending their dissertations. The Graduate School requires G5 students to register for nine credits, which can be research or other graduate courses relevant to their dissertation. Courses outside of the major require the approval of the dissertation advisor and Graduate Director. Failure to complete the RPE within the specified time frame and obtain the G5 status is considered evidence of unsatisfactory progress.

E. Thesis Proposal Requirement

After the student has completed the requirements in subsections C and D, and with the approval of the student's research advisor, the student will present a thesis proposal. The purpose of the thesis proposal is to assess student's progress toward the the Ph.D. thesis. The proposal must be submitted to the student's Thesis Committee within 18 months of the time the student had passed the research proficiency examination. Failure to fulfill this requirement by that time without a formal extension may be considered evidence of unsatisfactory progress toward the Ph.D. degree.

The major requirements of the thesis proposal are as follows: (1) the student must be thoroughly familiar with the background and current status of the intended research area; (2) the student must have clear and well-defined plans for pursuing the research objectives; and (3) the student must offer evidence of progress in achieving these objectives.

The student will present the thesis proposal to the thesis committee in a seminar presentation. It is limited to members of the committee, invited computer science faculty, and invited graduate students. Faculty members are free to question the student on any topics they feel are in any way relevant to the student's objectives and career preparation. Most questions, however, will be directed toward verifying the student's grasp of the intended specialty in depth. The student will be expected to show complete familiarity with the current and past literature of this area.

The findings of the committee will be communicated to the student as soon as possible and to the Graduate School within one week of the presentation of the proposal. If the committee finds the thesis proposal unsatisfactory, the student will submit an improved proposal, if such resubmission is approved by the Dean of the Graduate School.

F. Dissertation

An important requirement of the Ph.D. program is the completion of a dissertation, which must be an original scholarly investigation. The dissertation shall represent a significant contribution to the scientific literature, and its quality shall be compatible with the publication standards of appropriate reputable scholarly journals.

G. Approval and Defense of Dissertation

The dissertation must be orally defended before a dissertation examination committee, and the candidate must obtain approval of the dissertation from this committee. The oral defense of the dissertation is open to all interested faculty members and graduate students. The final draft of the dissertation must be submitted to the committee no later than three weeks prior to the date of the defense.

H. Satisfactory Progress and Time Limit

A student who does not meet the target dates for the Qualifying Examination, the Research Proficiency Examination, and the Thesis Proposal, or who does not make satisfactory progress toward completing thesis research may lose financial support. The candidate must satisfy all requirements for the Ph.D. degree within seven years after completing 24 credit hours of graduate courses in the Department of Computer Science at Stony Brook. In rare instances, the dean of the Graduate School will entertain a petition to extend this time limit, provided it bears the endorsement of the department's graduate program director. A petition for extension must be submitted before the time limit has been exceeded. The dean or the department may require evidence that the student is still properly prepared for the completion of work.

I. Part-Time Students

Students admitted into the Ph.D. program for part-time study are bound by all the rules set out henceforth. In particular, part-time students should adhere to the schedule for the Qualifying Examination, Research Proficiency Examination, and Thesis Proposal unless a different schedule has been approved in writing by the Graduate Director.

J. Satisfactory Progress and Time Limit

A Ph.D. student who has passed the Research Proficiency Examination can complete the requirements for an M.S. degree by satisfying the proficiency requirements and completing 31 credits of coursework. Passing the Qualifying Examination is considered to have satisfied the proficiency requirements. (Another way to satisfy these requirements is, of course, to take the required courses.)

At most nine credits of seminars (excluding CSE 600), special topics courses, or CSE 593 (Independent study) can be included in the required 31 credits. A student who has switched from the M.S. program to the Ph.D. program can in addition use the previously earned credits of CSE 523/524 toward the aforesaid nine credits. These nine credits together with the RPE are considered to be equivalent to the Thesis Option in the M.S. program. The remaining 22 credits required for the M.S. degree must be satisfied by taking technical graduate courses in computer science (i.e., excluding courses such as CSE 523/524, CSE 587, CSE 593, CSE 596, CSE 599, CSE 696, CSE 698, CSE 699, seminars, and special topics).

Courses

A current list of courses can be found at www.cs.stonybrook.edu/graduate/courses/index.html.

Required Courses for the M.S. Non-Thesis Option

CSE 523 Introduction to Software Engineering and Project Plan

A project in programming or digital system design that will extend over two consecutive semesters. The student starts the project in one semester by registering for CSE 523 and completes the project in the following semester by registering for CSE 524. Before the deadline date designated by the course instructor the student will prepare a one to two page description of the work that is expected to be completed during the two semester sequence. This description, reviewed and approved by the student's advisor, will reside in the student's file. Performance in completing the course requirements will be evaluated with reference to the implied promise contained. Amendments to the project description must be approved by the advisor. This course is graded separately from CSE 524.

Prerequisite: Limited to CSE graduate students; others, permission of instructor
Fall, spring, and summer, 3 credits,
ABCF grading
May be repeated twice for credit

CSE 524 Lab in Computer Science II

This course involves implementation and completion of the project undertaken in CSE 523. Results are to reflect all aspects of large-scale problem-solving, including cost analysis, design, testing, and documentation. A final report documenting requirements, design, implementation, and testing is required. When appropriate, a user's manual may be written.

Spring, 3 credits, ABCF grading

Graduate Courses

CSE 502 Computer Architecture

Topics covered include instruction pipelines and memory caches to improve computer performance; instruction-level parallelism; machines: superscalar versus VLIW; cache and main memory hierarchy design tradeoffs; compiler optimizations to speed pipelines; low-power computer system design: processor, OS, and compiler support; graphics, DSP, and media processor design; disk I/O system design; interconnections and networking; and introduction to parallel architecture. Advanced topics include asynchronous microprocessors; FPGA-based reconfigurable computing; system on a chip; embedded processors; intelligent RAM and superconducting computers.

Spring, 3 credits, ABCF grading

CSE 504 Compiler Design

This course covers advanced topics in compilation, including memory management, dataflow analysis, code optimization, just-in-time compilation, and selected topics from compilation of object-oriented and declarative languages.

Spring, 3 credits, ABCF grading

CSE 505 Computing with Logic

The course explores logic-based computing and logic programming. It includes an introduction to programming in logic, covering basic techniques for solving problems in a logic programming system. Particular attention will be paid to user interface issues and how a logic system can provide a useful computing environment. The course covers implementation issues, emphasizing how a logic programming system generalizes both traditional programming language systems and traditional database systems.

Prerequisite: CSE 214

3 credits, ABCF grading

CSE 506 Operating Systems

This course is an in-depth study of important concepts and techniques found in modern computer operating systems. An undergraduate course in operating systems is a prerequisite. The course focuses on in-depth study of such important issues as virtual memory, file systems, networking, and multiprocessor support, with an eye to recent directions in these areas. Textbook readings are supplemented where appropriate by papers from the research literature. An important part of the course is the case study of an actual operating system. Students study the source code for this operating system and do programming exercises and projects that involve modifying the operating system and measuring its performance.

Spring, 3 credits, ABCF grading

CSE 507 Introduction to Computational Linguistics

Overview of computational approaches to language use. Core topics include mathematical and logical foundations, syntax, semantics and pragmatics. Special topics may include speech processing, dialog system machine translation information extraction and information retrieval. Statistical and traditional approaches are included. Students will develop familiarity with the literature and tools of the field.

Spring, 3 credits, ABCF grading

CSE 508 Network Security

Principles and practice of Computer Network Security. Cryptography, authentication protocols, public key infrastructures, IP/www/E-commerce security, firewalls, VPN, and intrusion detection. Limited to CSE graduate students. Others; permission of instructor.

Prerequisite: CSE/ISE 310, or CSE 346 or equivalent

3 credits, ABCF grading

CSE 509 Computer System Security

Principles and practice of building and administering secure systems. Authentication and access control. Operating system security. Program security, database security. Key management. Information flow. Assurance. Vulnerability analysis and intrusion detection.

Prerequisite: CSE 306 or CSE 376, or equivalent; limited to CSE graduate students; others, permission of instructor

3 credits, ABCF grading

May be repeated for credit

CSE 510 Hybrid Systems

Hybrid Systems combine discrete state-machines and continuous differential equations and have been used as models of a large number of applications in areas such as real-time software, embedded systems, robotics, mechatronics, aeronautics, process control and biological systems. The course will cover the state-of-the-art of modeling, design and analysis of hybrid systems.

Prerequisite: Limited to CSE graduate students; others, permission of instructor

Spring, 3 credits, ABCF grading

May be repeated for credit

CSE 515 Introduction to Transaction Processing Systems

Discusses transaction processing systems. Topics covered include models of transactions, including nested transactions and workflow; architectures of transaction processing systems, including client-server, two-tiered and three-tiered architectures; concurrency controls for conventional and relational databases including two-phase locking and the SQL isolation levels; logging and recovery; distributed transactions including the two-phase commit protocol; replication; Internet commerce, including encryption, the SSL and SET protocols, goods atomicity, and electronic cash.

Prerequisite: CSE 305

Fall, 3 credits, ABCF grading

CSE 525 Introduction to Robotics

This course introduces fundamental concepts in Robotics. In the first half of the course, basic concepts will be discussed, including coordinate transformation, kinematics, dynamics. Laplace transforms, equations of motion, feedback and feedforward control, and trajectory planning. These topics will be exemplified with Matlab/Simulink simulation studies. The second half of the course will focus on applying the knowledge from the initial lectures to various motor systems, including manipulators, artificial eye systems, locomotory systems, and mobile robotics. There will be homeworks for Matlab/Simulink and a final project, a midterm and a final.

Prerequisite: Admission to CSE Graduate Program; instructor's permission

3 credits, ABCF grading

CSE 526 Principles of Programming Languages

Discusses programming language concepts and design, with emphasis on abstraction mechanisms. Topics include language paradigms (procedural, object-oriented, functional, and logic), language concepts (values, bindings, types, modules), and foundations (lambda calculus, denotational semantics). Examples will be drawn from several representative languages, such as C, Java, Standard ML, and Prolog.

Spring, 3 credits, ABCF grading

CSE 527 Introduction to Computer Vision

Introduction to basic concepts in computer vision. Low level image analysis, image formation, edge detection, segmentation. Image transformations for image synthesis methods for 3D scene reconstruction, motion analysis, object recognition.

Prerequisites: CSE 214, linear algebra, calculus, C/C++ proficiencies

3 credits, ABCF grading

CSE 528 Computer Graphics

This course emphasizes a hands-on approach to the use of computer graphics. The topics covered include models, picture description, and interaction; c windowing, clipping, panning, and zooming; geometrical transformations in 2D and 3D; algorithms for raster displays (scan-line conversion, polygon fill, polygon clipping, etc.); hidden line and hidden surface removal, shading models; user interaction. The students will implement a substantial graphics application program.

Fall, 3 credits, ABCF grading

CSE 529 Simulation and Modeling

A comprehensive course in formulation, implementation, and application of simulation models. Topics include data structures, simulation languages, statistical analysis, pseudo-random number generation, and design of simulation experiments. Students apply simulation modeling methods to problems of their own design. This course is offered as CSE 529, AMS 553, and MBA 553.

Prerequisite: CSE 214 or equivalent; AMS 310 or 507 or equivalent; or permission of instructor

3 credits, ABCF grading

CSE 530 Geometric Foundations

This course will focus on mathematical tools, geometric modeling techniques, and fundamental algorithms that are relevant to graphics, visualization, and other visual computing areas. The goal is to provide graduate students with a comprehensive knowledge on geometric concepts and demonstrate the significance of these mathematical tools and geometric algorithms in graphics and relevant areas. Course topics include geometric algorithms for both polygonal and curved objects, theory of parametric and implicit representations, modeling methods of curves, surfaces, and solids, in-depth spline theory, rudiments of wavelet theory and multi-resolution shape representations, differential geometry fundamentals, and other sophisticated topics and latest advances in the field.

Spring, 3 credits, ABCF grading

CSE 532 Theory of Database Systems

The course will cover advanced topics in modern database systems, including object-oriented databases, rule-based databases, temporal and active databases, parallel and distributed databases, distributed object model, data mining, online analytical processing, data warehousing, multimedia databases.

Fall and spring, 3 credits, ABCF grading

CSE 533 Network Programming

Topics include socket and client-server programming, remote procedure calls, data compression standards and techniques, real-time protocols (audio chat, etc.) security and cryptography (specifically, application layer security issues, authentication), Web-related programming (CGI, Java/JavaScript, HTTP, etc.), network management (SNMP-based management, dynamic/CORBA-based management).

Fall and spring, 3 credits, ABCF grading

CSE 534 Fundamentals of Computer Networks

Data Transmission: Introduction to Fourier analysis; data coding and signals, noise, Nyquist's Theorem, Shannon's theorem, bandwidth/baud rate/bit rate; data multiplexing techniques, ASK, FSK, PSK; Modems, and modern standards and techniques (e.g. Trellis Coding, etc.), Data Link Layer: Protocols; Error detection and correction; flow control; etc., Network Layer: protocols; routing algorithms; flow and detection and correction; congestion control; etc., quality-of-service issues at the network and transport layer, local area networks (including MAC, high-speed LANs; wireless LANs; bridges; etc), high-speed networks (BISDN; ATM standard, etc.).

3 credits, ABCF grading

CSE 535 Asynchronous Systems

Discusses asynchronous systems, their description using concurrent and distributed programming languages, and their verification. Topics include concurrent programming using shared memory and message passing, formal semantics of communication, reliability, and concurrent algorithms.

Prerequisite: Limited to CSE graduate students; others, permission of department
3 credits, ABCF grading

CSE 536 Introduction to User-Interface Development

Survey of user-interface systems, includes command language, windowing, multiple input/output devices, architecture of user interface management systems, toolkits for designing user-interface, human factors, standards, visual languages. The course also includes discussion of emerging technologies, such as systems for cooperative work, physically distributed user-interfaces, parallelism and user-interfaces, virtual reality. A substantial project requiring the design, implementation, and evaluation of a user-interface will be required.

3 credits, ABCF grading

CSE 537 Artificial Intelligence

A comprehensive introduction to the problems of artificial intelligence and techniques for attacking them. Topics include problem representation, problem-solving methods, search, pattern recognition, natural language process-

ing, learning, expert systems, AI programming languages and techniques. Covers both theoretical methods and practical implementations.

Fall, 3 credits, ABCF grading

CSE 540 Theory of Computation

Topics include models of computation: finite-state machines, stack machines, Turing machines, Church's thesis; computability theory: halting problem and unsolvability, introductory recursion theory; complexity theory: complexity measures, time and space hierarchy, NP-complete problems.

Fall, 3 credits, ABCF grading

CSE 541 Logic in Computer Science

A survey of the logical foundations of mathematics and the relationships to computer science; development of propositional calculus and quantification theory; the notions of a proof and of a model; completeness theorem.

Spring, 3 credits, ABCF grading

CSE 542 Speech Processing

Introductory speech processing course, surveying speech analysis, speech recognition and speech synthesis. Students will develop familiarity with speech processing tools (PRAAT, HTK, Festival).

Spring, 3 credits, ABCF grading

CSE 547 Discrete Mathematics

This course introduces such mathematical tools as summations, number theory, binomial coefficients, generating functions, recurrence relations, discrete probability, asymptotics, combinatorics, and graph theory for use in algorithmic and combinatorial analysis. This course is offered as both CSE 547 and AMS 547.

Spring, 3 credits, ABCF grading

CSE 548 Analysis of Algorithms

Techniques for designing efficient algorithms, including choice of data structures, recursion, branch and bound, divide and conquer, and dynamic programming. Complexity analysis of searching, sorting, matrix multiplication, and graph algorithms. Standard NP-complete problems and polynomial transformation techniques. This course is offered as both AMS 542 and CSE 548.

Spring, 3 credits, ABCF grading

CSE 549 Computational Biology

This course focuses on current problems in computational biology and bioinformatics. Our emphasis will be algorithmic, on discovering appropriate combinatorial algorithm problems and the techniques to solve them. Primary topics will include DNA sequence assembly, DNA/protein sequence assembly, DNA/protein sequence comparison, hybridization array analysis, RNA and protein folding, and phylogenetic trees.

Fall, 3 credits, ABCF grading

CSE 555 Computational Geometry

Study of the fundamental algorithmic problems associated with geometric computations, including convex hulls, Voronoi diagrams, triangulation, intersection, range queries, visibility, arrangements, and motion planning for robotics. Algorithmic methods include plane sweep, incremental insertion, randomization, divide-and-conquer, etc. This course is offered

as both AMS 545 and CSE 555.

Spring, 3 credits, ABCF grading

CSE 564 Visualization

The course emphasizes a hands-on approach to scientific visualization. Topics include traditional visualization, the visualization process, visual perception, basic graphics and imaging concepts, volume and surface visualization, volume graphics, visualization of sampled and computed data case studies, and visualization systems.

Spring, 3 credits, ABCF grading

CSE 580 Topics in Computer Science

An advanced lecture course on a new topic in computer science. The course is primarily designed for M.S. students, but can be taken by Ph.D. students as well. Semester supplements to this Bulletin contain specific description when course is offered. May be repeated for credit as the topic changes, but cannot be used more than twice to satisfy CSE major requirements for M.S.

3 credits, ABCF grading

May be repeated for credit

CSE 581 Topics in Computer Science

An advanced lecture course on a new topic in computer science. The course is primarily designed for M.S. students, but can be taken by Ph.D. students as well. Semester supplements to this Bulletin contain specific description when course is offered. May be repeated for credit as the topic changes, but cannot be used more than twice to satisfy CSE major requirements for M.S.

3 credits, ABCF grading

May be repeated for credit

CSE 582 Topics in Computer Science

An advanced lecture course on a new topic in computer science. The course is primarily designed for M.S. students, but can be taken by Ph.D. students as well. Semester supplements to this Bulletin contain specific description when course is offered. May be repeated for credit as the topic changes, but cannot be used more than twice to satisfy CSE major requirements for M.S.

3 credits, ABCF grading

May be repeated for credit

CSE 587 Proficiency Requirement in Computer Science

Students can get credit for a 300-level undergraduate course by registering for CSE 587. The syllabus of the undergraduate course must specify additional work that graduate students must do in order to pass the course. Graduate students taking an undergraduate course under CSE 587 number must be graded separately from the undergraduate students. See Graduate Student Handbook for restrictions on the use of this course.

Fall and spring, 2 credits, ABCF grading

May be repeated for credit

CSE 590 Topics in Computer Science

An advanced lecture course on a new topic in computer science. The course is primarily designed for M.S. students, but can be taken by Ph.D. students as well. Semester supplements to this Bulletin contain specific description when course is offered. May be repeated for

credit as the topic changes, but cannot be used more than twice to satisfy CSE major requirements for M.S.

Prerequisite: Limited to CSE graduate students; others, permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit

CSE 591 Topics in Computer Science

An advanced lecture course on a new topic in computer science. The course is primarily designed for M.S. students, but can be taken by Ph.D. students as well. Semester supplements to this Bulletin contain specific description when course is offered. May be repeated for credit as the topic changes, but cannot be used more than twice to satisfy CSE major requirements for M.S.

Prerequisite: Limited to CSE graduate students; others, permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit

CSE 592 Topics in Computer Science

An advanced lecture course on a new topic in computer science. The course is primarily designed for M.S. students, but can be taken by Ph.D. students as well. Semester supplements to this Bulletin contain specific description when course is offered. May be repeated for credit as the topic changes, but cannot be used more than twice to satisfy CSE major requirements for M.S.

Prerequisite: Limited to CSE graduate students; others, permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit

CSE 593 Independent Study in Computer Science

Students can register for this course in order to conduct or participate in a project under the supervision of a Computer Science faculty member. The student must prepare a description of the project or the course to be taken and submit it before the add/drop deadline to the project sponsor. The description will reside in the student's file. Both M.S. and Ph.D. students can take this course. This course cannot be taken as part of M.S. Thesis research—use CSE 599 in this case. Ph.D. students take CSE 593 for any kind of research or project work prior to advancement to candidacy (G5 status). After the advancement, CSE 699 should be used to conduct Dissertation Research.

Prerequisite: Limited to CSE graduate students; others, permission of instructor
Fall, spring, and summer, 1-9 credits,
ABCF grading
May be repeated for credit

CSE 594 Topics in Computer Science

An advanced lecture course on a new topic in computer science. This course is primarily designed for M.S. students, but can be taken by Ph.D. students as well. Semester supplements to this Bulletin contain specific description when course is offered. May be repeated for credit as the topic changes, but cannot be used more than twice to satisfy the CSE major requirements for the M.S.

Prerequisite: Admission to CSE Graduate Program; instructor's permission
Fall, spring, every year, 3 credits,
ABCF grading
May be repeated for credit

CSE 595 Topics in Computer Science

An advanced lecture course on a new topic in computer science. This course is primarily designed for M.S. students, but can be taken by Ph.D. students as well. Semester supplements to this Bulletin contain specific description when course is offered. May be repeated for credit as the topic changes, but cannot be used more than twice to satisfy the CSE major requirements for the M.S.

Prerequisite: Admission to CSE Graduate Program; instructor's permission
Fall, spring, every year, 3 credits,
ABCF grading
May be repeated for credit

CSE 596 M.S. Internship in Research

Participation in private corporations, public agencies, or non-profit institutions. Students will be required to have a faculty coordinator as well as a contact in the outside organization to participate with them in regular consultations on the project, and to submit a final report to both. At most one credit can be accepted toward the M.S. degree.

Fall and spring, 1-3 credits, S/U grading
May be repeated for credit

CSE 599 M.S. Thesis Research

This course can be used only for M.S. Thesis research; non-thesis research should be done under the designation of CSE 593: Independent Study. M.S. students who wish to enroll in CSE 599 for any number of credits must prepare a 1-2 page description of the work to be completed. The description must be approved by the research advisor, signed by both student and advisor, and will reside in the student's file. Amendments to the proposal must be approved by the advisor. Up to 9 credits of CSE 599 can be counted toward the 31 credits that are required for graduation.

Prerequisite: Limited to CSE graduate students; others, permission of instructor
Fall, spring, and summer, 1-12 credits,
S/U grading
May be repeated for credit

ISE 503 Data Management

This course provides an understanding of the issues in managing database systems as an essential organizational resource. Students learn the enterprise data architecture components, data storage configurations, and information retrieval methods. It expands from the relational model to the multidimensional model, object-relational techniques, and web accessed data. The course includes concepts, principles, issues, and techniques for managing corporate data resources. Techniques for managing the design and development of large database systems including logical data models, concurrent processing, data distribution, database administration, data warehousing, data cleansing, and data mining. Students will use current methods and tools for database design and development.

Prerequisite: Limited to CSE/ISE graduate students; others, permission of instructor
3 credits, ABCF grading
May be repeated for credit

ISE 504 Analysis, Modeling, and Design

This course provides an understanding and application of system analysis and design

processes. Students evaluate and choose appropriate system development methodologies and design a system. Students learn the importance of effective communication and integration with users and user systems. The course emphasizes interpersonal skill development with clients, users, team members, and others associated with the development, operation, and maintenance of systems. The course includes the system development life cycle; analysis and design techniques; information systems planning and project identification and selection, requirements collection and structuring, process modeling, data modeling, design of interface and data management, system implementation and operation, system maintenance, and change management implications of systems, and globalization issues in systems. Students will use current methods and tools such as rapid application development, prototyping, and visual development.

3 credits, ABCF grading
May be repeated twice for credit

ISE 506 Quantitative Computer Architecture

Explores the physical structure of a computer; machine representation of information; architecture and organization of various mainframe, mini-, and microcomputers; primary and secondary storage; and input and output communication. Architectural choices are compared and used to determine resulting function and performance. Architectural trade-offs are also identified.

3 credits, ABCF grading
May be repeated for credit

ISE 507 Project Management

The course focuses on both the technical aspects of project management as well as the human aspects. Technical components include project definition, work breakdown structure development, and the use of optimization techniques for planning a project and optimizing schedules. Graphical approaches to project definition are addressed, as are needs analysis, preliminary design, and detailed design and implementation. Human aspects of project management include forming a project team, managing performance, and resolving conflicts.

Prerequisite: ISE graduate students or permission of instructor
3 credits, ABCF grading

ISE 516 Systems Engineering Principles

An introduction to the full range of system engineering concepts, tools and techniques. These elements are applied to both large- and small-scale projects. The course provides a review of the stages of an integrated, top-down, life-cycle approach to design engineering—from analysis of customer requirements to maintenance and support, from definition of system operational concepts through material disposal and ability and maintainability engineering, human factors, safety, logistics engineering, quality engineering and value-cost engineering. The course also includes a treatment of crucial management issues, such as the planning and development of System Engineering Management Plans (SEMPs), work breakdown structures (WBSs), cost projections and supplier selection and management.

3 credits, ABCF grading
May be repeated twice for credit

ISE 517 Human Factors in Systems Engineering

The course focuses on techniques to integrate human factors into the design of systems so that the systems match human abilities and limitations. The course addresses techniques to translate system requirements into project specific design requirements. The course addresses physiological and mental characteristics of humans and emphasizes methods used to generate human factors inputs for engineering work products. The course describes the effect of human factors on each stage of development. *Spring, 3 credits, ABCF grading*
May be repeated twice for credit

Advanced Courses

The following are courses normally considered appropriate for the Ph.D. program, although they can be elected by M.S. students with permission of the advisor.

CSE 600 Topics in Modern Computer Science

A survey of current computer science research areas and issues. This course comprises lectures by faculty members and visitors, selected readings, and introductory-level research problems. *Prerequisite: Permission of instructor*
1 credit, SIU grading
May be repeated for credit

CSE 601 Advanced Image Processing

Modern approaches to Image Processing, Statistical Image Formation and Image Models, Image Restoration, Reconstruction and Segmentation, Applications to Medical Imaging. Crosslisted with ESE 559. *Prerequisites: Linear Analysis, Engineering Math, Fourier Analysis, Calculus, Programming*
3 credits, ABCF grading

CSE 602 Advanced Computer Architecture

The focus will be on the architectural rather than micro-architectural issues, and a systems approach to computer architecture taking into account the interaction between the architecture and the compiler, operating system, database, and networking. The course starts with superscalar/VLIW processor architecture and proceeds to memory hierarchy, storage systems, network hardware, graphics processor, and database machines. The emphasis will be on hands-on evaluation of architectural ideas, the exploration of software/hardware design trade-offs, and the articulation of experimental procedures and performance analysis. A publication-quality class project will be required.

Prerequisite: CSE 502 or permission of instructor
3 credits, ABCF grading

CSE 605 Performance Evaluation of Computer Systems

The purpose of this course is to provide background and training in understanding and evaluating performance of computer systems, including centralized, distributed, parallel, client/server based systems, and computer communication networks. The goal is to develop a perspective on how the performance

of computer systems or networks should be evaluated in order to decide on various design alternatives. The course will include various analytical techniques, mainly based on Markov models and queuing theory, and simulation modeling.

Fall, 3 credits, ABCF grading
May be repeated twice for credit

CSE 606 Performance Evaluation of Computer Systems

The purpose of this course is to provide background and training in understanding and evaluating performance of computer systems, including centralized, distributed, parallel, client/server based systems, and computer communication networks. The goal is to develop a perspective on how the performance of computer systems or networks should be evaluated in order to decide on various design alternatives. The course will include various analytical techniques, mainly based on Markov models and queuing theory, and simulation modeling.

Fall, 3 credits, ABCF grading
May be repeated twice for credit

CSE 608 Advanced Computer Security

Advanced course on principles and practice of engineering secure information systems. Topics covered include threats and vulnerabilities, counter measures, legal policy issues, risk management and assurance. In-depth coverage of various research problems, which will vary from one offering of the course to another.

Spring, 3 credits, ABCF grading
May be repeated twice for credit

CSE 610 Parallel Computer Architectures

Topics include parallel computer systems; important parallel applications; parallel computation models; interconnection networks; SIMD and MIMD architectures; hybrid architectures; memory management; cache coherence; distributed shared memory; synchronization methods; operating systems; compilers; and programming tools.

Prerequisite: CSE 502 or permission of instructor
3 credits, ABCF grading

CSE 611 Transaction Processing

An advanced course in transaction processing systems covering the latest developments in the area. Topics include stable storage, distributed database systems, commitment protocols, failures, replication and advanced models of transactions.

Prerequisite: CSE 515
3 credits, ABCF grading

CSE 612 Advanced Visualization and Volume Graphics

This course discusses advanced concepts in the area of volumetric data modeling and visualization. Topics included are: visual exploration of multi-variate and multi-dimensional datasets on regular and irregular grids, modeling of natural phenomena and simulation of realistic illumination, volumes as magic clay for sculpting and deformation effects, non-photorealistic rendering for illustration and artistic works, information-centric exploration of large datasets and exploitation of

hardware for acceleration. The course strives to provide a snapshot on the current state of the art and will be supported mostly by recent research papers. Students will expand on a topic of their choice by completing an individual project.

Prerequisites: CSE 564; limited to CSE graduate students; others, permission of instructor
Fall, 3 credits, ABCF grading

CSE 613 Parallel Programming

Discusses algorithms and techniques for programming highly parallel computers. Topics include sorting and counting algorithms; parallel arithmetic; matrix and systolic array algorithms; graph algorithms; packet routing; image analysis; algorithmic variations for linear arrays, trees, meshes of trees, and higher dimensional cube architectures; PRAM models of computation; parallel AI; methods to reduce communication latency; access to shared data; synchronization methods. Equivalent to AMS 530, both not to be taken for credit.

Prerequisite: CSE 502, permission of instructor, or CSE 612
3 credits, ABCF grading

CSE 614 Advanced Programming Languages

Selected topics on advanced programming languages technology. Program analysis and transformation, program optimization and program manipulation systems. Very high-level and declarative languages such as sets and relations based languages and deductive and object-oriented languages.

Spring, 3 credits, ABCF grading
May be repeated for credit

CSE 615 Advanced Computer Vision

Survey of methods used for the analysis of images by computer, including computer vision and pattern recognition. Topics to be covered are image formation, image segmentation and edge detection, binary images and shape analysis, shape from shading, motion field and optical flow, surface inference, classification techniques.

Prerequisite: B.S. degree in Computer Science, Engineering, Mathematical or Physical Sciences
3 credits, ABCF grading

CSE 616 Digital Multimedia Systems

In-depth survey of multimedia computing, including media conversion, data compression, multimedia data representation and modeling, authoring techniques, audio and video editing, 2D and 3D animation, media synchronization, distributed multimedia, and advanced application development.

Prerequisite: CSE 333 or CSE 536
3 credits, ABCF grading

CSE 618 Advanced Computer Graphics

Advanced topics in rendering and modeling realistic 3D imagery including texture mapping and synthesis, radiosity, amorphous phenomena, artificial life, and animation. Further contents include introductions to free-form curves and surfaces, volume rendering, and image-based rendering.

Prerequisite: Limited to CSE graduate students; others, permission of instructor
3 credits, ABCF grading
May be repeated for credit

CSE 620 Virtual Reality

Practical issues in the design and implementation of virtual environments. Topics include system requirements, transformations, user-interaction models, human vision models, input/output devices and techniques, tracking systems, augmented reality, and virtual-reality applications. The course will involve a substantial programming project to implement an immersive virtual reality system.

Prerequisite: CSE 328, 528, 332, or 564
3 credits, ABCF grading

CSE 621 Physics-based Modeling for Visual Computing

A unified approach to various fields such as graphics, visualization, computer-aided geometric design, biomedical imaging, vision, and virtual environment. The course will explore select research topics centered on physics-based modeling methodology and associated computational methods for theoretical and practical problems in widespread areas of visual computing. The emphasis will be on geometric and solid modeling, geometric design techniques, wavelets and multi-resolution analysis, deformable models based on mathematical physics, variational analysis, optimization methods, numerical simulation with finite-difference and finite-element algorithms, differential equations for initial-value and boundary-value problems, force-driven interaction with constraints, dynamic sculpting system, and a large variety of applications for visual computing.

Prerequisite: CSE 528 or permission of instructor
3 credits, ABCF grading

CSE 622 Advanced Database Systems

The course covers selected topics on the cutting edge of database technology, such as deductive database query languages and systems, object-oriented data models, persistent programming languages, heterogeneous databases, and advanced transaction models.

Prerequisite: CSE 532 or permission of instructor
3 credits, ABCF grading

CSE 624 Advanced Operating Systems

This is a survey of modern operating system techniques, especially those needed for distributed operating systems. Topics include network topologies, interprocess communication, failure detection and system recovery, local kernel functions, global network services, location transparency, large network constraints, distributed control algorithms (synchronization, configuration, deadlock detection, and searches), and existing distributed operating systems.

Prerequisite: CSE 506 or permission of instructor
3 credits, ABCF grading

CSE 625 Asynchronous Systems

Formal specification and verification of asynchronous systems. Topics include concurrent programming, process algebras, logics for

describing the properties of concurrent systems, and formal semantics of communication.

Prerequisite: CSE 535 or permission of instructor
3 credits, ABCF grading
May be repeated for credit

CSE 626 Switching and Routing in Parallel and Distributed Systems

This course covers various switching and routing issues in parallel and distributed systems. Topics include message switching techniques, design of interconnection networks, permutation, multicast and all-to-all routing in various networking nonblocking, and rearrangeable capability analysis and performance modeling.

Prerequisites: ESE 503 and 545 or CSE 502 and 547, or permission of instructor
3 credits, ABCF grading

CSE 628 Natural Language Processing

A survey of computational approaches to natural language processing issues in phonology, morphology, syntax, semantics, and pragmatics. Topics to be discussed include natural language parsing algorithms, generation algorithms, and knowledge representations. Models for speech recognition systems, story understanding systems, and natural language front ends to databases and other application programs will be investigated.

Prerequisite: CSE 537
3 credits, ABCF grading

CSE 630 Theory of Computational Complexity

Machine-based polynomial-time complexity theory, including nondeterministic computation, probabilistic computation, time and space trade-off, and complexity hierarchy; applications to related areas such as combinatorial algorithms and cryptography.

Prerequisites: CSE 540 or CSE 548 or permission of instructor
3 credits, ABCF grading

CSE 631 Advanced Logic in Computer Science

The course may include the following: deductive theorem proving (resolution, sequent-style calculi, natural deduction), inductive theorem proving, equational reasoning (rewrite systems), non-classical logics (modal logics, intuitionistic logic).

Prerequisite: CSE 541 or permission of instructor
3 credits, S/U grading

CSE 633 Computability and Undecidability

Computability theory based on Turing machines and recursive functions; proof by diagonalization and reducibility; unsolvable problems in set, group, number and language theory; reducibility orderings and degrees of unsolvability; priority methods and Post's problem.

Prerequisite: CSE 540 or permission of instructor
Spring, 3 credits, ABCF grading

CSE 634 Data Mining Concepts and Techniques

Data Mining is a new, promising and flourishing interdisciplinary field drawing work from

areas including database technology, artificial intelligence, machine learning, pattern recognition, high-performance computing, and data visualization. It focuses on issues relating to the feasibility, usefulness, efficiency and scalability of techniques for automated extraction of patterns representing knowledge implicitly stored in large databases, warehouses, and other massive information repositories. The course gives a broad, yet in-depth overview of the field of data mining and presents one or two techniques in rigorous detail.

Prerequisite: Database course
3 credits, ABCF grading

CSE 636 Analysis and Synthesis of Computer Communication Networks

Topics include analysis of message queuing and buffering in computer networks; survey of OSI layered architecture; network topology; local, metropolitan, and wide area networks; circuit and packet switching techniques; high-speed and lightwave network concepts: Synchronous Optical Network (SONET), Fiber Distributed Data Interface (FDDI), Distributed Queue Dual Bus (DQDB-QPSX), Integrated Services Digital Networks (ISDN), Broadband-ISDN, and Asynchronous Transfer Mode (ATM).

Prerequisite: CSE 533
3 credits, ABCF grading

CSE 637 Program Semantics and Verification

Topics include formal approaches to defining semantics of programming languages: denotational, operational, axiomatic, and transformational semantics; formal systems for program verification; logics of program, type theory, lambda calculus; further topics selected from term rewriting approach to proving properties of data types, and semantics and verification of languages with concurrent and parallel constructs.

Prerequisite: CSE 541
3 credits, ABCF grading

CSE 638 Advanced Algorithms

This is an advanced course in the design and analysis of combinatorial algorithms, focusing on recent material and special topics, including randomized algorithms, approximation algorithms for NP-complete problems, string algorithms, amortized analysis of data structures, and heuristic methods such as simulated annealing. Material will be selected to have little or no overlap with traditional introductory algorithms courses.

Prerequisite: CSE 548 or permission of instructor
3 credits, ABCF grading

Seminars and Special Topics Courses

CSE 640 Seminar in Theory of Computing

CSE 641 Seminar in Logic in Computer Science

CSE 642 Seminar in Algorithms

CSE 643 Seminar in Concurrency

CSE 644 Seminar in Databases

CSE 645 Seminar in Languages

CSE 646 Seminar in Artificial Intelligence

CSE 647 Seminar in Image Processing

CSE 648 Seminar in Graphics

CSE 649 Seminar in Operating Systems

CSE 650 Seminar in Architecture

CSE 651 Seminar in Applications

CSE 652 Seminar in User Interfaces

CSE 653 Seminar in Virtual Reality

CSE 654 Seminar in Visualization

CSE 655 Seminar in Modeling and Simulation

CSE 656 Seminar in Computer Vision

Current readings in computer vision and image understanding.

Prerequisite: Limited to CSE graduate students; others need instructor consent
Fall, 1 credit, S/U grading
May be repeated for credit

CSE 657 Seminar in Design Analysis

Methods for constructing reliable and efficient computer systems. Topics include: modeling and specification, analysis and verification, design and optimization, code generation, simulation and testing. Tool support. Applications and case studies.

Prerequisite: Limited to CSE graduate students; others need instructor consent
Fall, 1 credit, S/U grading
May be repeated for credit

CSE 658 Seminar on Mobile and Wireless Networking

This seminar course will draw topics from mobile and wireless networks of current interest. The main focus will be multi-hop wireless networks. It will cover topics on mobile routing, multiple access and transport protocols for such networks. It will also cover topics from micromobility architectures and pervasive computing.

Fall, 1 credit, S/U grading
May be repeated twice for credit

CSE 659 Seminar in Computer Security

Seminar course, covering various research problems in computer security.

Spring, 1 credit, S/U grading
May be repeated for credit

CSE 660 Seminar in Media Networks

Graduate seminar that covers recent work on multimedia and networks.

Fall and spring, 1 credit, S/U grading
May be repeated for credit

CSE 661 Seminar in Data Privacy

Current research in Data Privacy.

Spring, 1 credit, S/U grading
May be repeated for credit

CSE 662 Seminar in Applied Cryptography

Prerequisite: Admission to CSE Graduate Program; instructor's permission

May be repeated for credit

CSE 665 Special Topics in Theory of Computing

CSE 666 Special Topics in Logic in Computer Science

CSE 667 Special Topics in Algorithms

CSE 668 Special Topics in Concurrency

CSE 669 Special Topics in Databases

CSE 670 Special Topics in Languages

CSE 671 Special Topics in Artificial Intelligence

CSE 672 Special Topics in Image Processing

CSE 673 Special Topics in Graphics

CSE 674 Special Topics in Operating Systems

CSE 675 Special Topics in Architecture

CSE 676 Special Topics in Applications

CSE 677 Special Topics in User Interfaces

CSE 678 Special Topics in Virtual Reality

CSE 679 Special Topics in Visualization

CSE 680 Special Topics on Modeling and Simulation

This is an advanced modeling and simulation course on selected research topics. This application-oriented course tries to address issues of modeling and simulation from graphics, animation, CAD/CAM, medicine, artificial life, and virtual environments. Primary areas covered by this course include visual modeling, mathematical methods for geometry, shape design technology, computational physics for simulation, and scientific computing techniques. New topics will be added each year to reflect the latest state-of-the-art.

Prerequisite: Graphics/visualization background or permission of the instructor
Fall and spring, 2 credits, ABCF grading

CSE 681 Special Topics in Computer Vision

Advanced research topics course.

Prerequisite: Limited to CSE graduate students; others need instructor consent
Fall, 2 credits, ABCF grading
May be repeated for credit

CSE 682 Special Topics in Design Analysis

Methods for constructing reliable and efficient computer systems. Topics include: modeling and specification, analysis and verification, design and optimization, code generation, simulation and testing. Tool support. Applications and case studies.

Prerequisite: Limited to CSE graduate students; others, instructor consent
Fall, 2 credits, ABCF grading
May be repeated for credit

CSE 683 Special Topics on Mobile and Wireless Networking

This course will draw topics from mobile and wireless networks of current interest. The main focus will be multi-hop wireless networks. It will cover topics on mobile routing, multiple access and transport protocols for such networks. It will also cover topics from micromobility architectures and pervasive computing.

Fall and spring, 2 credits, ABCF grading
May be repeated twice for credit

CSE 684 Special Topics in Computer Security

Special topics course covering selected research areas in computer security.

Spring, 2 credits, ABCF grading
May be repeated twice for credit

CSE 685 Special Topics in Media Networks

Current topics in media networks.

Fall and spring, 2 credits, ABCF grading
May be repeated for credit

CSE 686 Special Topics in Data Privacy

Advanced research topics course.

Spring, 2 credits, S/U grading
May be repeated for credit

CSE 687 Special Topics in Applied Cryptography

Prerequisite: Admission to CSE Graduate Program; instructor's permission
May be repeated for credit

CSE 690, 691, 692 Advanced Topics in Computer Science

An advanced lecture course on a new topics in computer science. This course is primarily designed for Ph.D. students, but can be taken by M.S. students as well. Semester supplements to this Bulletin contain specific description when course is offered. May be repeated for credit as the topic changes, but cannot be used more than twice to satisfy CSE major requirements for M.S.

Prerequisite: Limited to CSE graduate students; others, permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit

Ph.D. Teaching and Research Experience

CSE 696 Internship in Research

See CSE 596 for similar description.
Fall and spring, 1 credit, S/U grading
 May be repeated for credit

CSE 698 Practicum in Teaching

Normally taken by Ph.D. students in their first year in conjunction with a TA.
Fall, spring, and summer, 1-3 credits, ABCF grading
 May be repeated for credit

CSE 699 Dissertation Research on Campus

This course is normally taken by advanced Ph.D. students when they conduct research towards their thesis. Only Ph.D. students who have been advanced to candidacy (G5 status) can take this course. Students who have the G3 and G4 status and participate in a research project with their advisor can register for CSE 593 Independent Study.
Prerequisite: Must be advanced to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab; limited to CSE graduate students; others, permission of instructor
Fall, spring, and summer, 1-9 credits, S/U grading
 May be repeated for credit

CSE 700 Dissertation Research off Campus-Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading
 May be repeated for credit

CSE 701 Dissertation Research off Campus-International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan they must file a waiver by the second week of classes; the charge will only be removed if other plan is deemed comparable); all international students must receive clearance from an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading
 May be repeated for credit

CSE 800 Summer Research

May be repeated for credit

School of Dental Medicine

Dean: Barry R. Rifkin, Rockland Hall 160 (631) 632-8950

Advanced Education Certificates awarded: Advanced Education Certificate in Orthodontics; Advanced Education Certificate in Periodontics; Advanced Education Certificate in Endodontics; Advanced Education Certificate in the Care for the Developmentally Disabled; General Practice Residency Certificate in conjunction with University Hospital

Degree awarded: D.D.S. in Dentistry; M.S. and Ph.D. in Oral Biology and Pathology

The primary mission of the School of Dental Medicine at Stony Brook University is to graduate dentists who are highly skilled general practitioners, able to integrate clinical, biomedical, and behavioral knowledge to advance the health and well being of their patients and their communities. They are expected to provide compassionate patient-centered care while demonstrating consistently the highest level of professionalism and sensitivity to the diverse personal and cultural contexts in which dental care is delivered. Furthermore, the educational experience encourages students to pursue postdoctoral training in general dentistry, the various clinical specialties, and/or research.

The School of Dental Medicine is fully accredited by the Commission on Dental Education and the State Education Department, and is a component school of the Health Sciences Center at Stony Brook. Admission to the School of Dental Medicine is highly competitive. The grade point averages and Dental Aptitude scores of incoming freshman typically place Stony Brook in the top tier of dental schools in the nation. Dental students take courses in anatomy, biochemistry, microbiology, pathology, pharmacology, and physiology at the medical school along with medical students. In the clinical component of the dental curriculum students take courses in behavioral sciences, dental anesthesiology, dental materials, dental medicine, endodontics, operative dentistry, oral biology, oral pathology, oral and maxillofacial surgery, orthodontics, pediatric dentistry, practice development, periodontics, and prosthodontics. Didactic and clinical performance on national and regional board examinations typically rank the School of Dental Medicine in the top tier of dental schools in the United States.

The School of Dental Medicine offers postdoctoral education in orthodontics, endodontics, periodontics, and care for the developmentally disabled. A general practice dental residency is

offered in conjunction with University Hospital. In addition, the School of Dental Medicine is affiliated with the oral and maxillofacial surgery residency program at Long Island Jewish Medical Center. The Master of Science and Doctor of Philosophy degrees are offered through the Graduate School of the University and the school's Department of Oral Biology and Pathology.

The Dental Care Center has 55,000 patient visits annually and delivers highly sophisticated care through its predoctoral program, postgraduate programs, and Faculty Practice. This enables the school to provide a very high level of clinical experience for students. The school is also the primary provider on Long Island of oral health care for individuals afflicted with developmental disabilities. The School of Dental Medicine provides an array of dental health educational programs for the public and conducts continuing education programs for community dental health professionals. The school has affiliations with a number of regional hospitals, including Long Island Jewish Medical Center, Nassau County Medical Center, and the Veterans Affairs Medical Center at Northport. These institutions, together with Stony Brook University Hospital, provide an environment for students to observe the effect of systemic disease on the structures of the oral cavity, and to participate as members of a healthcare team in the treatment of patients.

Since its inception in 1973, the School of Dental Medicine has been an innovative, research-oriented institution, which has sought to improve oral and systemic health through basic and applied research. A significant facet of the school's research mission is the translation of basic knowledge into practical clinical application. This endeavor has resulted in numerous patented technologies and the development of three oral health care companies. Further evidence of the school's research productivity includes the success of the faculty in obtaining a high level of fund-

ing from federal, state, and industrial sources. Two faculty members have received prestigious MERIT Research Awards from the NIH. The School of Dental Medicine's Ph.D. program in Oral Biology has a record over the last 25 years of training basic science and clinical researchers who have assumed leadership roles in both academic and industrial institutions.

Excellence through diversity is the standard by which the school conducts its education and patient care programs. Multicultural representation by faculty and students is present at all levels in the school. Over the last quarter century, the School of Dental Medicine at Stony Brook has achieved an enviable reputation for the excellence of its educational programs. It continues to supply both the national and local community with dentists who are well educated in the latest technical, biological, and psychological aspects of dental practice.

For further information, call the School of Dental Medicine at Stony Brook, 632-8900.

All questions concerning admission to the School of Dental Medicine should be addressed to:

School of Dental Medicine
Office of Academic Affairs,
Admissions, and Financial Aid
Stony Brook University
Stony Brook, NY 11794-8709
(631) 632-8980

You may also request a copy of the School of Dental Medicine Admissions and Application Guide.

Refer all questions concerning the Doctor of Philosophy in Oral Biology and Pathology to the Graduate School.

Ecology and Evolution (BEE)

Chairperson: Charles Janson, Life Sciences Building 650 (631) 632-8600

Graduate Program Director Ph.D.: F. James Rohlf, Life Sciences Building 650 (631) 632-8580

Graduate Program Director M.A.: Lev Ginzburg, Life Sciences Building 650 (631) 632-8569

Graduate Program Coordinator: Iris Roth, Life Sciences Building 650 (631) 632-8604

Degrees awarded: M.A. in Biological Sciences: Concentration in Applied Ecology; Ph.D. in Ecology and Evolution

The Graduate Program in Ecology and Evolution, in the College of Arts and Sciences, leads to the Ph.D. and in special cases to the M.A. In the first year, students take courses in ecology, evolution, and biometry. Advanced courses and seminars are taken in subsequent years. Research opportunities include a broad spectrum of theoretical, laboratory, and field problems involving diverse groups of terrestrial, freshwater, and marine organisms in various geographic regions, including the tropics. The program includes diverse approaches to ecological and evolutionary problems, stressing population biology in its experimental, field-oriented, and mathematical aspects. Certain aspects of genetics (especially population and ecological genetics), marine biology, paleontology, behavior, morphometrics, and multivariate statistics are studied in relation to ecological and evolutionary problems. Some staff members are actively involved in ecologically based social action in the Long Island area and on a national and international scale. Graduates are qualified for positions in academic or research institutions, government agencies, conservation organizations, and environmental consulting companies. A detailed description of the program, including degree requirements and specific research interests of staff members, is available at <http://life.bio.sunysb.edu/ee> or may be requested from the graduate program director. Applicants are encouraged to contact individual faculty members in their areas of interest.

The Department of Ecology and Evolution and the Graduate Program in Ecology and Evolution (GPEE) at Stony Brook were the first such units in the United States and have served as models for other institutions. Since its inception, GPEE has emphasized the integration of ecological and evolutionary approaches to topics such as population dynamics, community structure, and evolutionary theory, and has emphasized experimental, theoretical,

and statistical methodologies in both the field and laboratory. Ph.D. dissertations have included such diverse approaches as field studies of interspecific interactions, laboratory studies of molecular evolution and ecological genetics, and mathematical and computer-based investigations of theoretical problems in ecology, population genetics, and systematics. Although GPEE emphasizes basic research, application of ecological and evolutionary principles to problems in such areas as marine toxicology, agricultural entomology, and risk assessment is encouraged. The faculty encourages independence and originality in student research. An atmosphere of collegiality and intellectual interchange prevails throughout the GPEE, and is fostered by discussion groups and a full program of invited speakers. GPEE at Stony Brook is widely regarded as among the leading programs in the field; its faculty includes two members of the National Academy of Sciences, several past presidents of major ecological and evolutionary societies, and authors of influential books on ecology, evolution, systematics, and biometrics. Former students in GPEE include faculty members in ecology, evolution, agricultural entomology, and marine biology at prominent universities in the United States and abroad, as well as members of federal and private environmental and conservation agencies.

M.A. Program in Applied Ecology

A three-semester program leads to an M.A. in Biological Sciences with a concentration in Applied Ecology. This offering provides training in environmental sciences for positions in government environmental offices, environmental departments of industrial companies, environmental consulting firms, and conservation and environmental protection organizations.

Phases of applied environmental projects include data collection and analysis and interpretation of the findings. The need for trained personnel is the

greatest in the data analysis phase, which is the focus of the concentration in Applied Ecology.

Students need to complete 30 credits and the master's paper to graduate; this can be achieved in three semesters.

Facilities

Ample laboratory, greenhouse, and environmental facilities and all of the normal laboratory equipment for biochemical studies are available. All the equipment typically found in modern laboratories concerned with protein electrophoresis and DNA analysis is available, including automated sequencer, high-speed and ultracentrifuges, sonicators, fraction collectors, spectrophotometers, liquid scintillation, and spectrofluorometers. The department houses laboratories of *Drosophila* genetics, bacterial genetics, and ecology. The department has unusually good computing facilities. In addition to microcomputers in most labs, UNIX-based servers are also available within the department for mail and more intense computations than can be provided by desktop computers.

Field and marine study areas are at Flax Pond, a University-affiliated laboratory near campus. Terrestrial studies are performed at the Ashley Schiff Nature Preserve, a 26-acre forested area on campus, or at the department's Swan Pond Biological Station, which includes pine-oak woodland, bog, and freshwater habitats. The University is a member of the Organization for Tropical Studies, which maintains field stations in Costa Rica. There are other opportunities for field studies both in this country and abroad; faculty members have continuing projects at Friday Harbor Marine Labs in Washington, the Rocky Mountain Biological Laboratory in Colorado, and Cook Inlet in Alaska. Collaboration is possible with scientists at Brookhaven National Laboratory, and several field stations are maintained by other university centers and colleges of the State University of New York. The Marine Sciences Research

Center of the State University is located on campus. Stony Brook is close enough to New York City and Washington, D.C. for arrangements to be made for consultation and work at museums and other institutions in those cities.

Admission

Admission to the Ph.D. Program

In addition to Graduate School admission requirements, the department requirements include:

A. A bachelor's degree in biology, chemistry, mathematics, or other courses of study that provide an appropriate background for advanced training in ecology and evolution;

B. Formal coursework in genetics, ecology, and the biology of a particular group of organisms;

C. Report of Graduate Record Examination (GRE) General Test scores and, for international students, TOEFL scores;

D. Acceptance by the Graduate Program in Ecology and Evolution and by the Graduate School.

Admission to the M.A. Program in Applied Ecology

In addition to Graduate School admission requirements, the department requirements include:

A. A bachelor's degree in a course of study that provides an appropriate background for advanced training in ecology.

B. Report of Graduate Record Examination (GRE) General Test scores and, for international students, TOEFL scores.

C. Acceptance by the Graduate Program in Ecology and Evolution and by the Graduate School.

Faculty

Distinguished Professors

- Fleagle, John G.¹, Ph.D., 1976, Harvard University: Primate evolution; comparative anatomy; behavioral ecology.
- Futuyma, Douglas, Ph.D., 1969, University of Michigan: Speciation; evolution of ecological interactions among species.
- Levinton, Jeffrey S., Ph.D., 1971, Yale University: Marine benthic ecology; population genetics of bivalve mollusks; paleoecology.
- Rohlf, F. James, Ph.D., 1962, University of Kansas: Multivariate data analysis techniques

- applied to problems in taxonomy and ecology; computer modeling; applied ecology.
- Sokal, Robert R., *Emeritus*. Ph.D., 1952, University of Chicago: Human population structure; spatial models in ecology and evolution; numerical taxonomy; theory of systematics.

Professors

- Bell, Michael A., Ph.D., 1976, University of California, Los Angeles: Evolutionary biology; ichthyology; paleobiology; geographic variation.
- Conover, David O.³, Ph.D., 1981, University of Massachusetts: Ecology of fishes; fisheries biology.
- Eanes, Walter F., Ph.D., 1976, Stony Brook University: Population and biochemical genetics of *Drosophila*; molecular evolution.
- Ginzburg, Lev, *Director of the Master's Program in Applied Ecology*. Ph.D., 1970, Agrophysical Institute, St. Petersburg, Russia: Theoretical and applied ecology.
- Gurevitch, Jessica, Ph.D., 1982, University of Arizona: Evolutionary ecology of plant populations and communities; plant physiological ecology.
- Janson, Charles H., *Chairperson*. Ph.D., 1985, University of Washington: Social ecology of vertebrates; plant dispersal strategies.
- Lerdau, Manuel, T., Ph.D., 1994, Stanford University: Plant ecology and physiology; global change.
- Lopez, Glenn R.³, Ph.D., 1976, Stony Brook University: Marine and freshwater benthic ecology; animal-microbe-sediment interactions; detritus.
- Slobodkin, Lawrence B., *Emeritus*. Ph.D., 1951, Yale University: Evolutionary strategy and constraints; Hydra; ecotoxicology.
- Susman, Randall L.¹, Ph.D., 1976, University of Chicago: Primate ecology.
- Williams, George C., *Emeritus*. Ph.D., 1955, University of California, Los Angeles: Evolution of life-history strategies; ecology and population genetics of marine fishes.
- Wright, Patricia⁷, Ph.D., 1985, City University of New York: Primates and tropical conservation.

Associate Professors

- Armstrong, Robert³, 1975, University of Minnesota: Mathematical modeling in marine ecology and biogeochemistry.
- Battley, Edwin H., *Emeritus*. Ph.D., 1956, Stanford University: Thermodynamics of microbial growth; ecological energetics; microbial ecology; nitrification and denitrification in aquatic systems.
- Bingham, Paul², Ph.D., 1979, Harvard University: Regulation of transcription in developing multicellular organisms; the role of transposons in evolution and speciation.
- Chase, Ivan⁴, Ph.D., 1972, Harvard University: Social behavior; dominance hierarchies; cooperation; resource distribution.
- Forster, Catherine A.¹, Ph.D., 1990, University of Pennsylvania. Vertebrate paleontology; systematics.

- Geeta, R., Ph.D., 1993, University of Arizona: Evolution of angiosperms; homeobox genes; genome size.
- Hechtel, George J.⁶, Ph.D., 1962, Yale University: Systematics and zoogeography of marine demospongiae.
- Padilla, Dianna K., Ph.D., 1987, University of Alberta, Canada: Phenotypic plasticity, plant-herbivore functional ecology, ecology of invading species.
- Pigliucci, Massimo, Ph.D., 1994, University of Connecticut: Plant population biology; ecological and evolutionary genetics.

Assistant Professors

- Graham, Catherine, Ph.D., 2003, University of Missouri, St. Louis: Landscape and behavioral ecology.
- True, John, Ph.D., 1995, Duke University: Evolutionary and developmental genetics of color patterning in *Drosophila*.
- Vedder, Amy L.⁸, *Research Assistant Professor*. Ph.D., 1989, University of Wisconsin-Madison: Mammalian ecology; tropical forest ecology; conservation biology, planning, and practice.
- Wiens, John J., Ph.D., 1995, University of Texas at Austin: Systematics and biology of reptiles and amphibians.

Number of teaching, graduate, and research assistants, fall 2005: 35

Students on fellowships: 11

- 1) Department of Anatomical Sciences
- 2) Department of Biochemistry
- 3) Marine Sciences Research Center
- 4) Department of Sociology
- 5) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1974
- 6) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1982
- 7) Department of Anthropology
- 8) Director, Africa Program, Wildlife Conservation Society

Degree Requirements Requirements for the M.A. Degree

The Graduate Program in Ecology and Evolution (GPEE) usually does not accept a student whose goal is an M.A. degree, except those who wish to concentrate in applied ecology (see below). However, a student already in GPEE may be awarded an M.A. degree upon satisfaction of the following requirements in addition to the minimum Graduate School requirements:

- A. Completion of an approved course of study including 30 graduate credit hours with a minimum 3.0 overall grade point average.
- B. Preparation of a research thesis.

Requirements for the Ph.D. Degree

A. Course Requirements

1. In the first year in residence, students are normally required to take BEE 550 Principles of Ecology, BEE 551 Principles of Evolution, BEE 552 Biometry, and BEE 556 Research Areas in Ecology and Evolution.

2. Students must take a minimum of three other graduate courses, other than seminars, within this or other programs of this or other universities.

3. BEE 671-672 Colloquium in Ecology and Evolution must be taken each year.

4. A minimum of one graduate seminar per year is required under normal circumstances.

5. Most students will require advanced training in various ancillary disciplines appropriate to their chosen field of research. Requirements will be determined by the student's advisory committee and might include one or more foreign languages or advanced studies in mathematics, statistics, computer sciences, biochemistry, taxonomy, or other areas.

B. Entering Student Advising and Evaluation

Early in the first semester of study, each student meets with an advisory committee that recommends additional courses beyond required first-year courses, and assigns one essay that provides the student with experience in synthetic thinking. This paper is a review of the primary literature, due in the second semester. During the third semester, an exam will be given testing the student's knowledge of ecology and evolution.

C. Preliminary Examination

No later than the end of the fourth year of study, a student takes a preliminary examination tailored to the student's interests and administered by his or her advisory committee. The examination includes an oral portion and may include a written portion, at the option of the student. The student and his or her committee decide in advance on the areas to be covered in this examination.

D. Language Requirements

The language requirement will be established by the student's advisory committee and will not exceed reading knowledge of two foreign languages.

E. Advancement to Candidacy

The faculty will recommend a student to the Graduate School for advancement to candidacy upon satisfactory completion of the preliminary examination and any language requirement established for the student, and upon acceptance of a thesis proposal by the faculty.

F. Research and Dissertation

A dissertation is required for the Ph.D. degree. It must contain the results of original and significant investigation. A dissertation proposal must be approved by the faculty during an early stage of the student's research. A student's progress in research is monitored by regular evaluations by the faculty in meetings held twice a year. Continued lack of progress may result in probation or dismissal.

G. Dissertation Committee

Students select a temporary advisor during the first semester and a permanent advisor usually before or during the third semester. The advisory committee, consisting of the permanent advisor and at least two other GPEE faculty members, is nominated by the student in consultation with his or her permanent advisor and must be approved by the graduate program director. Additional members from outside GPEE and/or the University may be appointed to the dissertation committee.

H. Final Examination

The dissertation must be approved by the student's advisory committee. A dissertation examining committee is then appointed by the dean of the Graduate School. A formal public oral dissertation defense is held, at which the student presents his or her findings and is questioned by the examining committee and other members of the audience.

I. Teaching Requirement

All graduate students completing a doctoral degree will function as teaching assistants during at least two semesters of their graduate careers.

J. Residence Requirement

At least two consecutive semesters of full-time graduate study are required. The demands of the course of study usually necessitate a longer period of residence.

K. Time Limit

The time limit imposed by the Graduate School is observed by GPEE. Students must satisfy all requirements for the Ph.D. degree within seven years after completing 24 credit hours of graduate courses in GPEE.

Requirements for the M.A. Degree in Applied Ecology

Students must complete 30 credits and achieve a 3.0 overall grade point average to graduate; this can be achieved in three semesters. Six courses form the core of the program: three courses focus on ecology; three provide training in mathematical methods, statistics, and computer programming. The six courses are:

BEE 550 Principles of Ecology

BEE 552 Biometry

BEE 555 Mathematical Methods in Population Biology

BEE 571 Ecology Laboratory

BEE 585 Introduction to Ecological Research

BEE 587 Applied Ecology and Conservation Biology Laboratory

A large number of elective courses are available to fulfill the degree requirements.

Courses

BEE 500 Directed Readings in Population Biology

Directed readings in topics of current interest, under supervision of a faculty sponsor, culminating in one or more critical review papers.

Prerequisite: Sponsor and approval of master's program executive committee
Fall and spring, 1-3 credits, S/U grading
May be repeated for credit

BEE 501 Directed Readings in the Biology of Organisms

Directed readings in topics of current interest, under supervision of a faculty sponsor, culminating in one or more critical review papers.

Prerequisite: Sponsor and approval of master's program executive committee
Fall and spring, 1-3 credits, S/U grading
May be repeated for credit

BEE 550 Principles of Ecology

Population dynamics, interactions of organisms, theoretical concepts of community structure and their biological and evolutionary implications.

Fall, 4 credits, ABCF grading

BEE 551 Principles of Evolution

Biological evolution, including the genetics of populations, speciation, evolution of higher taxa, and the fossil record.

Fall, 4 credits, ABCF grading

BEE 552 Biometry

An intensive course in statistical theory and methodology. The analysis of real biological data is emphasized. Topics include analysis of variance, simple multiple and curvilinear regression analysis, correlation analysis, and goodness of fit tests.

Spring, 4 credits, ABCF grading

BEE 553 Multivariate Analysis in Biology

An introduction to multivariate statistical analysis for biologists. Topics include general least squares analysis, MANOVA, cluster analysis, and factor analysis.

Prerequisite: BEE 552 or equivalent

Fall, 3 credits, ABCF grading

BEE 554 Population Genetics and Evolution

A general introduction to mathematical population genetics and evolutionary theory. The effects of mutation, recombination, selection, and migration are studied. Modern concepts in both theoretical and experimental population genetics are covered.

Prerequisite: BEE 552 or equivalent and a course in evolution

Spring, odd years, 0-3 credits, ABCF grading

BEE 555 Mathematical Methods in Population Biology

This course covers a variety of mathematical methods used in modern theoretical biology. Topics include linear algebra and applications, ordinary and partial differential equations, and stochastic processes. Examples from population biology, i.e., mathematical ecology and population genetics, are used throughout.

Fall, even years, 3 credits, ABCF grading

BEE 556 Research Areas of Ecology and Evolution

A description of the current research areas of ecology and evolution, broadly conceived. All first-year ecology and evolution students are expected to participate.

Fall and spring, 1-2 credits, S/U grading

May be repeated for credit

BEE 558 Tutorial Readings

Individual tutorial study with an instructor in the Graduate Program in Ecology and Evolution for the purpose of background reading in an area of ecology and evolution.

Fall and spring, 1-4 credits, S/U grading

May be repeated for credit

BEE 559 Individual Studies in Organisms

A detailed study of the biology of a selected systematic group chosen by the graduate student and a faculty member. This is conducted as a tutorial course.

Fall and spring, 1-4 credits, ABCF grading

May be repeated for credit

BEE 561 Macroevolution

This course emphasizes the processes generating large-scale evolutionary trends and patterns. Topics include rates of evolutionary

change; patterns of speciation and extinction, including radiations and mass extinctions; the role of constraint and innovation in molding evolutionary patterns; adaptive landscapes and complex character evolution; development and evolution; the origin and importance of major body plans; and the role of biogeography and climate in evolution.

Spring, odd years, 3 credits, ABCF grading

BEE 562 Concepts and Methods in Evolutionary Biology

This course provides a basic understanding of the varied methods (both experimental and statistical) that make up the body of evolutionary quantitative biology. The focus will be on quantitative genetics and its interface with modern approaches, including QTL mapping, bioinformatics, genomics, proteomics, etc. Students will also become familiar with the philosophy of science as it relates to the conceptual analysis of ideas in modern evolutionary and ecological theory. Topics include falsificationism, induction, deduction, hypothesis testing and the nature of evidence, as well as the meaning of natural selection, genetic drift, and constraints in evolutionary ecology.

Prerequisite: BEE 551

Spring, alternate years, 3 credits,

ABCF grading

BEE 564 Geometric Morphometrics

An introduction to theory and methods used in geometric morphometrics. Image analysis, outline methods, landmark methods, and shape statistics are covered.

Prerequisite: BEE 552 or equivalent;

BEE 553 recommended

Fall, even years, 3 credits, ABCF grading

BEE 565 Molecular Evolution

An introduction to the use of molecular information in population genetics, evolution, and taxonomy. This course combines discussions of methodology, data, and theory to illustrate how molecular information is changing our view of the evolutionary process.

Prerequisite: BEE 551 or permission of instructor

Spring, odd years, 3 credits, ABCF grading

BEE 567 Molecular Diversity Laboratory

This course will provide hands-on experience in established and recently developed methods of detecting and analyzing molecular variation (DNA, RNA, Proteins) in nature. Natural populations of *Drosophila melanogaster* will be the model material for this laboratory. The main theme of this course is that molecular variation is abundant in nature and is an important tool for understanding adaptive evolution and species relationships.

Prerequisite: Permission of instructor

Fall, 3 credits, ABCF grading

BEE 571 Ecology Laboratory

This course stresses the collection, analysis, and interpretation of ecological data, mostly in terrestrial settings. Laboratory and field exercises demonstrate the operation of general ecological principles in specific populations and communities.

Fall, 3 credits, ABCF grading

BEE 575 Evolutionary Ecology

The approach is to understand the theoretical basis and review empirical tests of diverse topics. The format includes both lectures and student-led discussions of primary literature.

Prerequisite: BEE 550, BEE 551, or permission of instructor

Fall, alternate years, 3 credits, ABCF grading

BEE 585 Research Design and Analysis in Ecology

This course covers topics relevant to carrying out ecological research, including sampling and quantitative description of ecological communities, spatial pattern and spatial heterogeneity, design and analysis of field experiments, application of demographic models, analysis of meta-population dynamics, and population estimations.

Spring, even years, 0-3 credits, ABCF grading

BEE 586 Introduction to Ecological Modeling

This course will provide students with a familiarity of the major concepts, approaches, and underlying rationale for modeling in the ecological sciences. Topics will include reviews of theoretical and empirical models, the use of models in adaptive management, and how to confront models with data to evaluate alternative hypotheses. Roughly one third of the course will be devoted to the use of models in management, focusing on the problems of fitting models to data and management pitfalls that follow. Course work will consist of readings, in class exercises, and group assignments that involve the construction, analysis, and interpretation of ecological models.

Prerequisite: BEE 550, BEE 552; MAT 131

or equivalent; any statistics course

Spring, 3 credits, ABCF grading

BEE 587 Applied Ecology and Conservation Biology Laboratory

A computer laboratory course introducing students to ecological risk analysis and conservation biology. Laboratories are based on interactive software. Computer simulation techniques for addressing problems in applied ecology are emphasized.

Prerequisites: A year of calculus; one-year

undergraduate biology course for majors

Spring, even years, 3 credits, ABCF grading

BEE 588 Current Topics in Ecology and Evolution

Subject matter varies from semester to semester, depending upon the interests of students and staff.

Fall and spring, 2 credits, S/U grading

May be repeated once for credit

BEE 599 Research

Original investigation undertaken with the supervision of a member of the staff.

Fall and spring, 1-12 credits, S/U grading

May be repeated for credit

BEE 670 Informal Seminar

Presentation of preliminary research results and current research problems by students and faculty.

Fall and spring, 0-2 credits, S/U grading

May be repeated for credit

BEE 671 Ecology and Evolution Colloquium

A weekly series of research seminars presented by visiting scientists as well as by the faculty. Required every semester of all ecology and evolution graduate students.

*Fall, 0-2 credits, S/U grading
May be repeated for credit*

BEE 672 Ecology and Evolution Colloquium

A weekly series of research seminars presented by visiting scientists as well as by the faculty. Required every semester of all ecology and evolution graduate students.

*Spring, 0-2 credits, S/U grading
May be repeated for credit*

BEE 689 Seminar on Adaptations of Marine Organisms

Seminars on selected topics concerning ecological, genetical, and evolutionary problems in the marine environment.

*Fall or spring, alternate years, 0-2 credits, S/U grading
May be repeated for credit*

BEE 690 Seminar on Evolutionary Processes

Seminars on selected topics concerning evolutionary processes.

*Fall or spring, alternate years, 0-2 credits, S/U grading
May be repeated for credit*

BEE 691 Seminar on Systematics and Phylogeny

Seminars on selected topics in systematics. Topics will include the theory of classification and numerical taxonomy, both phenetic and cladistic.

*Fall or spring, alternate years, 0-2 credits, S/U grading
May be repeated for credit*

BEE 692 Seminar on the Environment and Human Affairs

Student seminars on selected topics concerned with the effect of man on the environment. Application of ecological and evolutionary theory to the solution of human problems.

*Fall or spring, 0-2 credits, S/U grading
May be repeated for credit*

BEE 693 Seminar on Population and Community Ecology

Student seminars on selected topics in population and community ecology.

*Fall or spring, 0-2 credits, S/U grading
May be repeated for credit*

BEE 699 Dissertation Research on Campus

Prerequisite: Must be advanced to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab

*Fall, spring, and summer, 1-12 credits, S/U grading
May be repeated for credit*

BEE 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab

and the Cold Spring Harbor Lab are considered on-campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

*Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

BEE 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

*Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

BEE 800 Full-Time Summer Research

May be repeated for credit

Economics (ECO)

Chairpersons: William Dawes, Ward Melville Social and Behavioral Sciences Building N-605 (631) 632-7556 and Warren Sanderson, Ward Melville Social and Behavioral Sciences Building N-605 (631) 632-7556

Graduate Program Director: Sandro Brusco, Ward Melville Social and Behavioral Sciences Building S-601 (631) 632-7548

Graduate Secretary: Jennifer Cacho, Ward Melville Social and Behavioral Sciences Building S-601 (631) 632-7530

Degrees awarded: M.A. in Economics; Ph.D. in Economics

The Ph.D. program in Economics, in the College of Arts and Sciences, emphasizes rigorous training in economic theory and quantitative methods and their creative application. Both theoretical and empirical work is heavily based on mathematical modelling. The goal is to develop the capability of each student to conduct independent research and analysis. To this end the program has three phases: (1) a general foundation in economic theory and quantitative methods, starting from the basic but done in a very mathematical way, (2) specialization in two or more fields of theoretical or applied economics, and (3) independent research culminating in the doctoral dissertation. These are not totally distinct phases but indicate the natural order of progression. Coursework is supplemented by independent study and research seminars. Throughout the program students have advisors to consult in developing a study plan that best meets their needs.

In addition to core courses, students choose elective courses from the variety of fields offered in theoretical and applied economics. It is through these courses that breadth of economic knowledge is gained.

The program of study does not depend on prior knowledge of economics, though that is useful. Because of its emphasis on mathematical modelling, the Ph.D. program is highly suitable for those whose undergraduate degrees are in physics, engineering, and mathematics. Those whose undergraduate degrees are in economics usually have to take a number of mathematics courses at a level not usually required for their undergraduate degree in order to be prepared for a Ph.D. program.

Admission

The Department of Economics normally admits students for the Ph.D. program. All students are eligible to receive the M.A. degree if they have met the degree requirements listed later in this section, but there is no separate M.A. program. Students are normally admitted only to start in the fall semester.

Minimum requirements to be considered for admission, in addition to the minimum Graduate School requirements, are as follows, although exceeding these requirements increases the probability of admission:

A. A bachelor's degree, with an average of at least B in the undergraduate major subject, which need not be economics (applicants with majors in mathematics, the physical sciences, or engineering are encouraged);

B. At least one year of introductory differential and integral calculus and at least one semester of linear algebra in courses whose level is that required for physics majors in research universities, with proficiency demonstrated by a grade of at least B in the courses. Additional semesters of multivariate calculus are highly recommended, further mathematics such as real analysis and topology are very helpful;

C. Letters of recommendation from three instructors or academic advisors. The referees should be sure to evaluate the mathematical preparation and ability of the applicant;

D. Submission of results of the Graduate Record Examination (GRE) General Test (verbal, quantitative, and analytical parts); applicants with quantitative scores below the 80th percentile are generally not admitted;

E. Foreign students only: submission of results of the TOEFL examination, with a minimum score of 550. In addition, a score of at least 40 in the TSE, which can be taken upon arrival. Scores below 550 require taking and passing language courses in addition to regular coursework;

F. Acceptance by the Department of Economics and by the Graduate School.

Students should be aware that admitted students generally exceed these requirements. However, students who do not meet or exceed all these requirements may apply if they think that their preparation as a whole shows they are

capable of succeeding in the graduate program. Application for admission in the academic year starting in September should ordinarily be submitted before the preceding March 1. Applicants seeking financial aid are required to apply by January 15.

Faculty

Professors

Dubey, Pradeep, Ph.D., 1975, Cornell University: Game theory; mathematical economics.

Montgomery, Mark, Ph.D., 1982, University of Michigan: Economic demography; development economics; econometrics.

Muench, Thomas J., Graduate Program Director. Ph.D., 1965, Purdue University: Mathematical economics; macroeconomics; econometrics; urban economics.

Neuberger, Egon, Emeritus. Ph.D., 1958, Harvard University: Comparative systems; Soviet and East European economics.

Rizzo, John (joint with the Department of Preventive Medicine) Ph.D., 1985, Brown University: Health economics; public health.

Sanderson, Warren C., Ph.D., 1974, Stanford University: Economic demography; economic history; labor economics.

Tauman, Yair, Ph.D., 1978, Hebrew University, Jerusalem: Industrial organization; game theory.

Zweig, Michael, Ph.D., 1967, University of Michigan: Political economy; labor economics.

Associate Professors

Brusco, Sandro, Ph.D., 1993, Stanford University: Mechanism design; corporate finance; political economy.

Dawes, William, Ph.D., 1972, Purdue University: Econometrics; economic history.

Assistant Professors

Anagnostopoulos, Alexis, Ph.D., 2005, London Business School: Macroeconomics; computational economics.

Benitez-Silya, Hugo, Ph.D., 2000, Yale University: Labor economics; computational economics.

Carceles-Poveda, Eva, Ph.D., 2001, Universidad Pompeu Fabra: Macroeconomics; financial economics; international economics.

Dwyer, Debra S., Ph.D., 1995, Cornell University: Microeconomics; health economics.

Tan, Wei, Ph.D. 2005, Johns Hopkins University: Industrial organization; applied econometrics; health economics.

Number of teaching, graduate, and research assistants, fall 2005: 27

Degree Requirements Requirements for the M.A. Degree in Economics

In addition to the minimum Graduate School requirements, the department has specific degree requirements. The M.A. degree requires a minimum of 30 resident graduate course credits in economics (500 level or above, not including ECO 698) with an average grade of B or higher. Evening or part-time programs are not available. Note: All these courses are Ph.D.-level courses.

Requirements for the Ph.D. Degree in Economics

The Ph.D. degree requirements are as follows:

A. Course Requirements

A minimum of 15 courses in economics (including core courses) must be completed, with a grade of B or better in each elective course. Included in the elective courses must be at least two in each of two approved pairs of courses forming fields (listed below). However, the Ph.D. committee may approve a waiver of part of the 15-course requirement for students with graduate work elsewhere.

1. **Core Courses:** Those courses that provide the foundation in economic theory (micro and macro) and quantitative analysis (mathematical methods, statistics, and econometrics) are referred to as core courses. Comprehensive examinations are taken in microeconomics, macroeconomics, and econometrics beginning at the end of the first year of study, and are to be completed by the beginning of the fourth semester. Comprehensive examinations are written but may be supplemented by oral examinations at the discretion of the examining committee.

2. **Elective Courses and Fields of Specialization:** In addition to core courses, normally at least six elective courses must be taken, including two pairs of courses, where each pair forms an approved field. It is usual but not necessary that a dissertation topic be chosen from one of these fields of specialization.

The two elective fields must be satisfactorily completed by the end of the sixth semester. One field may be com-

pleted on the basis of an average grade of B+ or higher in the courses in that field. At least one field must be completed by passing a written comprehensive exam. Fields currently offered by the department are composed of courses in game theory, industrial organization, applied econometrics, labor economics, health economics, demographic economics, computational methods, and computational macroeconomics.

B. Second-Year Paper, Seminars, and Workshops

Each student must write a successful research paper during the second year.

Each student takes a research workshop in the fifth semester. The purpose of this workshop is to provide a structured introduction to research methodology.

In addition, participation in program seminars and research workshops is considered an essential part of a student's progress toward the doctorate. Seminars in economic theory and applied economics are presented on a regular basis by faculty, visitors, and graduate students. Workshops oriented toward thesis research are conducted by faculty and students working in related areas.

C. Advancement to Candidacy

Advancement to candidacy for the Ph.D. is achieved by satisfactory completion of most course requirements specified in item A, above, and successful work on the second-year paper. Advancement to candidacy normally must be achieved by the end of the fourth semester.

D. Dissertation

A dissertation, presenting the results of original and significant research, must be approved. An examination on dissertation proposal research must be passed by the end of the sixth semester of study. The examination is both written and oral, and its syllabus is to be determined by the student's dissertation committee in consultation with the student. Final approval of the dissertation will be by a committee including the candidate's principal advisor, two other department members, and one member from another department. The results of the dissertation will be presented at a colloquium convened for that purpose.

E. Teaching

The program is committed to achieving a high quality of teaching and encourages

all graduate students to acquire teaching experience during their graduate studies. The department operates a training program to prepare teaching assistants for classroom instruction.

F. Time Limit

If the degree requirements have not been met within five years of entry into the program, departmental approval is required for continuation in the program.

G. Dismissal Policy

A student may be dismissed from the program at the end of any semester in which he or she does not achieve a semester or cumulative B average or fails to meet the pertinent requirements for the Ph.D. as specified.

Courses

ECO 500 Microeconomics I

The first semester of a one-year course in microeconomic theory. Deals with decision-making of economic agents in different choice environments using the analytical approach of duality theory. Topics include theory of the consumer, theory of the firm, decision-making under risk and uncertainty, intertemporal choice, aggregation, and capital theory.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Fall, 3 credits, ABCF grading

ECO 501 Microeconomics II

A continuation of ECO 500, focusing on theories of equilibrium and market structure. Topics include general competitive equilibrium, imperfect competition and game theory, imperfect information, theory of public goods, and social choice.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Spring, 3 credits, ABCF grading

ECO 510 Macroeconomics I

The first semester of a one-year course in macroeconomic theory. Deals with theories and determinants of income, employment, and inflation. Topics include static equilibrium models, theories of money demand and monetary phenomena, theories of the labor market and unemployment, rational expectations and stabilization policy, consumption, and investment.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Fall, 3 credits, ABCF grading

ECO 511 Macroeconomics II

A continuation of ECO 510, focusing on dynamic models. Topics include models of economic growth, optimal growth and efficiency, overlapping-generations models,

rational expectations, and optimal policy.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Spring, 3 credits, ABCF grading

ECO 520 Mathematical Statistics

The first semester of a one-year course in quantitative methods. Statistical methods and their properties of particular usefulness to economists. Topics include probability theory, univariate and multivariate distributions, limiting distributions, point and interval estimation, hypothesis testing.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Fall, 3 credits, ABCF grading

ECO 521 Econometrics

A continuation of ECO 520. The application of mathematical and statistical methods of economic theory, including the concept of an explanatory economic model, multiple regression, hypothesis testing, simultaneous equations models, and estimating techniques.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Spring, 3 credits, ABCF grading

ECO 522 Applied Econometrics

A continuation of ECO 521. The application and extension of econometric techniques developed in ECO 521. Emphasis on the relationship among economic theory, econometric modeling and estimation, and empirical inference. Computer usage for calculation of estimators. Critical examination of econometric studies in current journals.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Fall, 3 credits, ABCF grading

ECO 590 Mathematical Foundations of Contemporary Economic Theory

A one-semester course dealing with mathematical concepts and techniques relevant to economic theory. Topics in set theory, topology, linear algebra, and optimization theory. Applications to economic theory developed as time permits.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Fall, 3 credits, ABCF grading

ECO 599 Research in Special Topics

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Fall and spring, 1-12 credits, S/U grading
May be repeated for credit

ECO 604 Game Theory I

Elements of cooperative and noncooperative games. Matrix games, pure and mixed strategies, and equilibria. Solution concepts such as core, stable sets, and bargaining sets. Voting games, and the Shapley and Banzhaf power indices. This course is offered as both ECO 604 and AMS 552.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
0-3 credits, ABCF grading

ECO 605 Game Theory II

Refinements of strategic equilibrium, games with incomplete information, repeated games with and without complete information, and stochastic games. The Shapley value of games with many players, and NTU-values. This course is offered as both ECO 605 and AMS 555.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Spring, 0-3 credits, ABCF grading

ECO 606 Advanced Topics in Strategic Behavior in Economics

An analysis of varying topics in strategic behavior in economics. One or more of the following topics and others will be dealt with each week: repeated games with incomplete information; stochastic games; bounded rationality complexity and strategic entropy; values of non-atomic games; strategic aspects in the telecommunication industry; general equilibrium and financial markets; auction mechanisms; knowledge, common knowledge, and strategic equilibria.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Spring, 1-3 credits, ABCF grading
May be repeated for credit

ECO 610 Advanced Macroeconomic Theory I

Topics in macroeconomic theory, including microfoundations of macroeconomics, temporary general equilibrium and disequilibrium, monetary theory, equilibrium theory of business cycles, implicit contracts, rational expectations, and econometric implications.

Prerequisites: ECO 501, ECO 511, graduate standing in the Economics Department or permission of the Graduate Director
0-3 credits, ABCF grading

ECO 612 Computational Economics and Dynamic Modeling

An analysis of the theory and applications of the dynamic modeling literature using computational methods, and on the methods themselves. Dynamic Modeling and Computational Economics are possibly the fastest growing areas of interest in the profession due to its suitability to model, solve and also estimate realistic decision making problems in most areas of economics.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Fall, 0-3 credits, ABCF grading

ECO 613 Computational Macroeconomics

A concentration on numerical methods commonly used to solve dynamic macroeconomic models. These include methods relying on dynamic programming techniques, linear approximation methods, and non-linear methods that can be applied to models with distortions and heterogeneous agents. The

different methods will be explained and their application to macroeconomics will be illustrated with examples from various areas such as Real Business Cycles, Asset Pricing with Complete and Incomplete Markets, and Recursive Contracts.

Prerequisite: Graduate standing in the Economics department or permission of the Graduate Director
Spring, 0-3 credits, ABCF grading

ECO 623 Data Analysis and Economic Applications

Survey of major sources of data in economics and theoretical hypotheses and statistical methods for organizing and analyzing such data. Statistical models for quantitative data as well as qualitative choices are presented. Computer usage is expected.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Spring, 0-3 credits, ABCF grading

ECO 629 Studies in Quantitative Methods

Prerequisites: ECO 521; graduate standing in the Economics Department or permission of the Graduate Director
Fall, 0-3 credits, ABCF grading

ECO 636 Industrial Organization I

Applications of microeconomic theory to the determinants of market structure. Relationships between market structure, firm behavior, and allocational efficiency. Econometric estimation and testing of some hypotheses suggested by the theory.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Fall, 0-3 credits, ABCF grading

ECO 637 Industrial Organization II

This course is a continuation of ECO 636. It deals with the same questions and tools as ECO 636, and provides an introduction to antitrust policy and to public policy toward industry, including regulation and deregulation, the design of optimal regulation, and the effectiveness of current regulation.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Spring, 0-3 credits, ABCF grading

ECO 640 Advanced Labor Economics Theory I

This is primarily a course in advanced labor economics theory. Some attention, however, is paid to empirical work. Topics include the theory of equalizing differentials, human capital, labor supply, life cycle behaviors, and income distribution.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
Fall, 0-3 credits, ABCF grading

ECO 642 Demographic Economics I

This course deals with the economics of the family. It utilizes recently developed techniques in economics and demography to deal with questions concerning marriage, divorce, fertility, contraception, the intrafamily

distribution of resources, and the intergenerational distribution of resources. Students will do original theoretical and empirical research under the professor's supervision.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
 Spring, 0-3 credits, ABCF grading

ECO 643 Demographic Economics I

This course is a continuation of ECO 642. It deals with the same questions and tools as ECO 642, but emphasizes developing economies. The connections between population growth and development are stressed.

Prerequisites: ECO 501, graduate standing in the Economics Department or permission of the Graduate Director
 0-3 credits, ABCF grading

ECO 645 Health Economics I

Critical reviews of research in health economics topics of current interest, such as empirical and conceptual models of physician behavior, competition in the pharmaceutical industry, the economic impacts of managed care, and the causes and consequences of unhealthy behaviors. Students will present and critique original research and produce a research paper on a topic of their interest.

Prerequisites: ECO 501, ECO 521, Graduate standing in the Economics Department or permission of the Graduate Director
 0-3 credits, ABCF grading

ECO 646 Health Economics II

Theoretical and econometric analysis of selected aspects of the health care delivery system, such as the demand for medical services, the supply and distribution of physician services, the utilization of non-physician medical personnel, alternative models of hospital behavior, third-party insurance reimbursement, national health insurance and cost, and price inflation in the hospital and long-term care sectors. Co-scheduled as ECO 646 or HPH 664.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
 Spring, 0-3 credits, ABCF grading

ECO 647 Research Methods in Applied Microeconomics

Presentation, discussion, and analysis of student and faculty research in the areas of applied microeconomics, labor economics, health economics and industrial organization, as well as applied econometrics. The purpose of the course is to provide skills and feedback to students at various levels in the program that assist them toward the completion of their second year paper, dissertation proposals and thesis. It is a course in research and presentation methods that provides an effective mechanism for learning about current areas of research interest.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
 Spring, 0-3 credits, ABCF grading

ECO 690 Seminar in Applied Economics

Preparation, presentation, and discussion of student and faculty research in applied economics. Topics covered by student papers are usually related to students' long-term research interests.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
 Spring, 1-6 credits, S/U grading

ECO 695 Research Workshop

Designed to direct students to the selection of dissertation topics. Oral and written presentation of student papers with active faculty participation. Several sections may be offered each semester in areas of broad research interest.

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
 Fall, 0-6 credits, S/U grading
 May be repeated for credit

ECO 698 Practicum in Teaching

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director
 Spring, 1-6 credits, S/U grading

May be repeated for credit

ECO 699 Dissertation Research on Campus

Prerequisite: Have declared thesis advisor in Economics Ph.D. program (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab

Fall, spring, and summer, 1-9 credits,
 S/U grading
 May be repeated for credit

ECO 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off-campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, and summer, 1-9 credits,
 S/U grading
 May be repeated for credit

ECO 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file

a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits,
 S/U grading
 May be repeated for credit

ECO 800 Summer Research

Prerequisite: Graduate standing in the Economics Department or permission of the Graduate Director

S/U grading
 May be repeated for credit

Education and Teacher Certification Professional Education Program

Director: Dorit Kaufman, Ph.D., Professional Education Program/Department of Linguistics

Associate Director and Teacher Certification Officer: Marvin Glockner, Ph.D., Professional Education Program/School of Professional Development

Associate Director for Administration: Mary Ann Short, M.A.L.S.

Senior Staff Assistant: Loretta Stanton, B.A.

Office Phone: (631) 632-4PEP

Office Fax: (631) 632-9487

Web site: www.pep.sunysb.edu

Degrees awarded: Biology, Chemistry, Earth Sciences, English, French, General Science with a discipline, German, Italian, Mathematics, Physics, Russian, Spanish, and Social Studies with Adolescent Education Teacher Certification; P through Grade 12 Certification in Teaching English to Speakers of Other Languages (TESOL)

The Professional Education Program (PEP) prepares students to become teachers of academic subjects in secondary schools (grades 7 through 12) and to become teachers of English to speakers of other languages (TESOL) in grades P through 12. Stony Brook's teacher certification programs are registered and approved by the New York State Education Department (NYSED). PEP has had a significant positive impact upon the Long Island region and the greater metropolitan area, and is widely recognized as a symbol of Stony Brook's commitment to teacher education, educational research and development, and partnership programs in collaboration with regional schools.

University-Wide Coordination of the Teacher Education Programs

PEP provides University-wide coordination of the teacher education programs. The programs are advised by an active and dedicated Advisory Board consisting of university faculty and representatives from regional school districts. PEP performs a major role in the region by coordinating, supporting, strengthening, and developing; pre-service and in-service teacher certification and professional development; educational research and development; and school-university partnership programs.

The university-wide approach to teacher education adopted by Stony Brook provides graduates with the intellectual rigor of an academic major as well as valuable professional credentials that qualify them to teach in New York State and many other states in the country. Stony Brook students preparing for teacher certification take their courses with the same faculty who teach undergraduate and graduate students in

the academic departments and interdisciplinary programs, and they have the same opportunities for experiences with renowned professors in each teaching field. Stony Brook students have consistently scored higher than the state average on each of the sub-tests of the New York State Teacher Certification Examinations (NYSTCE).

Fieldwork and clinical placements for Stony Brook students are available in an interesting cross-section of cooperating school districts that draw upon school populations with a wide range of socio-economic backgrounds, including students that are culturally diverse, those with disabilities, and gifted and talented students. Many schools are engaged in innovative and experimental programs in education.

The Office of Teacher Certification advises prospective teacher certification candidates on procedures for obtaining New York State teacher certification. Upon successful completion of the University's program, the student must apply for state certification by completing the necessary application forms (available from the Office of Teacher Certification); completing the certificate requirements for Training in Child and Substance Abuse Recognition and Reporting and Project Safe (School Violence); processing of fingerprints; and passing the New York State Teacher Certification Examinations (NYSTCE). Clearance and applications for the certificate are processed by the Office of Teacher Certification, which keeps documentation pertaining to these services on file and makes it available to students for in-state and out-of-state certification purposes, and to prospective employers.

The Career Placement Center is available to assist students. Through its

credentials service, recommendations supporting students in their application for jobs are kept on file. Copies of these recommendations are sent to prospective employers upon request. The Center also posts announcements for teaching jobs available locally and in schools around the country. Students seeking employment in school districts off Long Island are invited to participate in the Long Island Teachers Recruitment Consortium. For more information, contact the Career Placement Center at (631) 632-6810 (Voice/TDD).

Teacher preparation programs are offered in the following subject areas:

Certification Grades 7 through 12:

Sciences: Biology, Chemistry, Earth Science, Physics, and an option for General Science with a science certification

English

Foreign Languages: French, German, Italian, Russian, and Spanish

Mathematics

Social Studies

Certification Grades Pre-K through 12:

Teaching English to Speakers of Other Languages (TESOL)

Major Components of the Teacher Preparation Programs

Students applying for certification must satisfy the following requirements:

A. Students must consult with the program director in the department in which they seek certification for the specific requirements of their program. Admission includes an application, three faculty recommendation forms attesting to the applicant's ability to do graduate level coursework, an application essay (described in the application form), GRE

General Exam scores, and additional requirements set by the academic department.

B. Students must complete all pedagogy courses encompassed in the professional study of education (credits may vary depending on the specific certification program).

Note: Students must achieve a minimum grade of B in all pedagogy courses.

C. Students must complete the State-mandated literacy requirement (contact your teacher preparation program director for course information).

D. Students must complete 100 field experience hours, prior to student teaching, with specific and diverse internships that include high needs districts, inclusion of students with special needs, integration of technology in the curriculum, literacy across all curricula, etc.

E. Students must complete one semester of clinical practice (Supervised Student Teaching). 75 days of student teaching are required. Dependent upon the semester and public school vacation schedules, student teaching may extend beyond the university semester calendar.

F. Students must complete one year of a language (two years for TESOL students) other than English at the college level (this may include ASL). However, individual majors may have more rigorous language requirements.

G. Requirements for certification and resulting license include passage of the Liberal Arts and Sciences Test (LAST), Assessment of Teaching Skills (ATS-W), and Content Specialty Test (CST). In addition, all candidates for license must complete seminars in the following: Training in Identifying and Reporting Suspected Cases of Child Abuse and Maltreatment, Identification and Referral of Substance Abuse, and Prevention and Intervention of School Violence. They must also be fingerprinted and receive clearance from the Department of Criminal Justice Services.

Faculty

Affiliated

Frank Anshen, Linguistics, Ph.D.

Charles Backfish, History, A.M.

Mary Jo Bona, European Languages, Literatures, and Cultures, Ph.D.

David Bynum, Cell Biology-Biochemistry, Ph.D.

Cecilia Cutler, TESOL, Ph.D.

Lou Deutsch, Hispanic Language, Literatures, and Cultures, Ph.D.

Patricia Dunn, English, D.A.

Georges Fouron, Africana Studies, Ed.D.

Lawrence Frohman, History, Ph.D.

Gilbert Hanson, Geosciences, Ph.D.

Joy Janzen, Linguistics, Ph.D.

Sarah Jourdain, European Languages, Literatures, and Cultures, Ph.D.

Dorit Kaufman, TESOL, Linguistics, Ph.D.

Robert Kerber, Chemistry, Ph.D.

Joan Kuchner, Child and Family Studies, Ph.D.

Mario LaMantia, History, M.A.

Mike Ledgerwood, European Languages, Literatures, and Cultures, Ph.D.

Kenneth Lindblom, English, Ph.D.

Irene Marchegiani, European Languages, Literatures, and Cultures, Ph.D.

Bernard Maskit, Mathematics, Ph.D.

Robert McCarthy, Physics and Astronomy, Ph.D.

Linda Padwa, Science, M.A.T.

Anthony Phillips, Mathematics, Ph.D.

Gabriela Polit, Hispanic Language, Literatures, and Cultures, Ph.D.

Neil Portnoy, Mathematics, Ph.D.

Joel Rosenthal, History, Ph.D.

Prosper Sanou, European Languages, Literatures, and Cultures, Ph.D.

Kathleen Vernon, Hispanic Language, Literatures, and Cultures, Ph.D.

Judy Wiegand, Mathematics, M.S.

Anne Wilding, Linguistics, M.A.

Zuzana Zachar, Cell Biology-Biochemistry, Ph.D.

Note: Additional affiliated content faculty are listed within the departments of the relevant disciplines.

Adjunct

Robert Andersen, Mathematics, M.S.

William Bernard, Mathematics, M.S.

Arlene Blecher, NYC, M.A./M.S.

Marie Brett, Linguistics, M.A./M.S.

Marianne Catalano, TESOL, M.A.

Michael DeStio, Science, M.S.

Richard Feldman, Science, M.A.

Genevieve Heidrich, History, M.S.W.

Paul Kaplan, Psychology, Ph.D.

Harvey Karron, History, M.A./M.S.

Bernard Kito, Science, M.A.L.S.

Gerard Lannigan, History, M.A.

Karen Lund, English, M.A.

Michael LoMonico, English, M.A.L.S.

Natalie Lukas, NYC Coordinator, M.S.

Barbara McAdorey, History, M.A.

Stanley Ogonowski, Science, M.A.

Frank Rizza, SPD, Ed.D./P.D.

Richard Rocco, History, M.A.

William Schiavo, English, M.A.

Stephen Z. Schneider, SPD, Ed.D.

Eli Seifman, SUTEC, Ph.D.

Pamela Selzer, TESOL, M.A.

Peter Smiles, English, M.A.

Wendy Turgeon, Philosophy, Ph.D.

Number of graduate assistants, fall 2005: 2

Master of Arts in Teaching: English

A. Program Description

The Master of Arts in Teaching (MAT): English (HEGIS 1501) is a course of study leading to New York State certification for teaching English in the secondary schools (grades 7-12). This program, which is offered in collaboration with the University's Department of English and Professional Education Program, is designed for those who have little or no previous coursework in education or formal classroom teaching experience.

B. Course of Study

This degree program consists of 41 credits, distributed among the areas listed below. Unless otherwise noted, each course is three credits.

English Language and Literature (15 credits)

Course selection will be determined by the student and advisor. Students who have academic deficiencies in English linguistics and/or did not complete an advanced analytical composition course are required to include courses that specifically address these deficiencies. These courses will be part of the 15 credits selected to satisfy this requirement. In addition, students may substitute one to six credits from Theatre Arts to fulfill the language literature requirement.

Professional Studies in Education (20 credits)

CEE 505 Education: Theory and Practice

CEE 565 Human Development

CEE 588 Methods of Instruction in Literature and Composition in the Secondary School

CEE 590 Student Teaching Seminar (prerequisites: CEE 588 and 593, CEF 551 and 552; co-requisites: CEQ 591 and 592)

CEE 593 Performance and Technology in Teaching Literature and Composition (prerequisites: CEE 588 and CEF 551; co-requisite: CEF 552)

CEF 551 Field Experience I—Grades 7-9 (co-requisite: CEE 588); 1 credit

CEF 552 Field Experience II—Grades 10-12 (prerequisites: CEE 588 and CEF 551; co-requisite: CEE 593); 1 credit

LIN 544 Language Acquisition and Literacy Development

Field Experience and Clinical Practice

Students are required to complete 100 clock hours of field experience related to coursework prior to student teaching or practica. These experiences include practicing skills for interacting with parents, experiences in high-need schools, and experiences with each of the following student populations: socio-economically disadvantaged students, students who are English language learners, and students with disabilities.

Supervised Student Teaching (6 credits)

CEQ 591 Supervised Student Teaching High School Grades 10–12: English (prerequisites: CEE 588 and 593, CEF 551 and 552; co-requisites: CEQ 590 and 592)

CEQ 592 Supervised Student Teaching Middle School Grades 7–9: English (prerequisites: CEE 588 and 593, CEF 551 and 552; co-requisites: CEQ 590 and 591)

Final Project

Students are required to submit a professional portfolio at the completion of the program.

C. Admissions Requirements

Students must have completed an academic major in English with a minimum GPA of 2.75 in their overall bachelor's degree program, and have a minimum GPA of 3.00 in English studies. Students must demonstrate, through their application and recommendations, that they possess the temperament and disposition to be an effective teacher. In addition, academic transcripts must indicate that the student has completed at least one year of college-level study of a foreign language.

Application Procedure

Applications and instructions are available on SPD's Web site at www.sunysb.edu/spd/graduate/index.html. Students may also call (631) 632-7055 to obtain an application packet. Return the completed packet to SPD (not to the Graduate School). Applications and supporting documentation (including GRE's) for the spring term must be received by November 15; for the fall term, by April 15. A completed packet consists of:

Completed MAT application with a \$100 non-refundable application fee;

Three letters of recommendation;

Official copies of all previous college transcripts;

Official report of scores on the Graduate Record Examination (General Test);

Immunization Record.

Teacher Certification

While NYSED requires a minimum of 30 credits in the content field in order to be certified, Stony Brook requires that students must have completed an undergraduate degree with a major in the content field, and a minimum of 36 credits, for admission to the MAT program. This major must be equivalent to a similar major at Stony Brook. In order to be recommended for New York State certification, students must complete all courses required for the MAT. In addition, transcripts must indicate that the student has completed at least one year of college-level study of a foreign language.

In order to be recommended for New York State certification, students must complete all courses required for the MAT plus any ancillary requirements. Students must also achieve a minimum grade of B in all pedagogy courses.

Note: The MAT in English consists of at least three semesters of work (excluding summer session) for full-time students and a somewhat longer period of time for part-time students.

Contact Information

Please contact one of the following:

Kenneth Lindblom, Program Advisor,
MAT in English
Kenneth.Lindblom@stonybrook.edu
(631) 632-7303

Professional Education Program
(631) 632-4PEP

School of Professional Development
Stony Brook University
Stony Brook, NY 11794-4310
E-mail: spd@stonybrook.edu
(631) 632-7055

See also, the English Teacher Education Program Web site at www.pep.sunysb.edu/tep_english.php.

Master of Arts in Teaching: Foreign Languages

A. Program Description

The Master of Arts in Teaching (MAT): Foreign Languages programs are designed as courses of study leading to New York State certification for teaching French, Italian, German, Spanish, and Russian in the secondary schools (grades 7-12). These programs are offered in collaboration with the University's Department of European Languages, Literatures, and Cultures; Hispanic Language, Literatures, and Cultures; and the Professional Education Program, and are designed for those with little or no previous coursework in education or formal classroom teaching experience.

B. Course of Study

These degree programs consist of 44 credits distributed among the areas listed below. Unless otherwise noted, each course is three credits.

Language, Literature and Culture (15 credits)

Courses not listed are selected with the approval of a departmental advisor.

French (HEGIS 1102)

FRN 501 Contemporary French Culture and Institutions

FRN 507 Advanced Stylistics

FRN 510 French Phonetics and Diction

Plus two additional graduate-level FRN literature course

Italian (HEGIS 1104)

ITL 501 Contemporary Italy

ITL 508 Advanced Grammar and Stylistics

ITL 509 Contrasting Italian and English

ITL 511 History of the Italian Language

Plus one additional graduate-level ITL literature course

German (HEGIS 1103)

GER 504 German Cultural History

GER 506 Advanced Stylistics

Plus one of the following:

GER 557 History of the German Language

GER 539 Contrastive Structures: German-English

GER 558 Middle High German

Plus two additional graduate-level GER literature courses

Russian (HEGIS 1106)

RUS 506 Russian Stylistics, or

RUS 520 Russian Syntax

RUS 538 Structure of Russian

SLV 504 Slavic Culture

Plus, two RUS graduate-level literature courses

Spanish

Five courses selected with approval of the graduate Spanish advisor. Courses may include:

SPN 501 Spanish Historical Linguistics

SPN 502 Methods in Linguistic Research

SPN 503 Spanish Linguistics

SPN 504 Contrastive Analysis: Spanish and English

SPN 505 Spanish Dialectology and Sociolinguistics

SPN 510 Hispanic Culture

SPN 515 Spanish Composition and Stylistics

SPN 500-level courses in Literature/Culture/Linguistics/Special Topics (with the permission of the graduate director)

SPN 691 Practicum in the Teaching of Spanish Language

Professional Studies in Education (23 credits)

CEE 505 Education: Theory and Practice

CEE 565 Human Development

FLA 505 Methods of Teaching Foreign Languages

FLA 506 Curriculum Development (prerequisite: FLA 505)

FLA 540 Foreign Language Acquisition Research

FLA 549 Field Experience I—Grades 7-9 (co-requisite: FLA 505)

FLA 550 Field Experience II—Grades 10-12 (co-requisite: FLA 506)

FLA 554 Student Teaching Seminar (prerequisites: FLA 505, 506, 540, and 571; co-requisites: FLA 551 and 552)

FLA 571 Technology and Education

Field Experience and Clinical Practice

Students will be required to complete 100 clock hours of field experience related to coursework prior to student teaching or practica. These experiences include practicing skills for interacting with parents, experiences in high-need schools, and experiences with each of the following student populations: socio-economically disadvantaged students, students who are English language learners, and students with disabilities.

Supervised Student Teaching (6 credits)

FLA 551 Supervised Student Teaching High School Grades 10-12: Foreign Languages (prerequisites: FLA 505, 506, 540, and 571; co-requisites: FLA 552 and 554)

FLA 552 Supervised Student Teaching Middle School Grades 7-9: Foreign Languages (prerequisites: FLA 505, 506, 540, and 571; co-requisites: FLA 551 and 554)

Final Project

Students are required to submit a professional portfolio at the completion of the program.

C. Admissions Requirements

Students are expected to have good preparation in the program language (a major, or a minimum of 36 credits) with a minimum GPA of 2.75 in their overall bachelor's degree program, and have a minimum GPA of 3.00 in language studies. Students must demonstrate, through their application and recommendations, that they possess the temperament and disposition to be an effective teacher.

Prior to student teaching, students must participate in an official ACTFL OPI (Oral Proficiency Interview) and receive a minimum spoken proficiency rating of Advanced-Low as defined in the ACTFL Proficiency Guidelines-Speaking (1999). Students must contact Language Testing

International (LTI) and arrange for either a face-to-face OPI or a phone interview.

Application Procedure

Applications and instructions are available on SPD's Web site at www.sunysb.edu/spd/graduate/index.html. Students may also call (631) 632-7055 to obtain an application packet. Return the completed packet to SPD. Applications and supporting documentation (including GRE's) for the spring term must be received by November 15; for the fall term, by April 15. A completed packet consists of:

Completed MAT application with a \$100 non-refundable application fee;

Three letters of recommendation;

Official copies of all previous college transcripts;

Several sample papers from your undergraduate program that demonstrate level of proficiency in the program language;

Official report of scores on the Graduate Record Examination (General Test);

Immunization Record.

Teacher Certification

While NYSED requires a minimum of 30 credits in the content field in order to be certified, Stony Brook requires that students must have completed an undergraduate degree with a major in the content field, and a minimum of 36 credits, for admission to the MAT program. This major must be equivalent to a similar major at Stony Brook. In order to be recommended for New York State certification, students must complete all courses required for the MAT plus any ancillary requirements. Students must also achieve a minimum grade of B in all pedagogy courses.

Contact Information

Please contact one of the following:

Sarah Jourdain, Program Director,
MAT in Foreign Languages
Sarah.Jourdain@stonybrook.edu
(631) 632-7440

Professional Education Program
(631) 632-4PEP

School of Professional Development
Stony Brook University
Stony Brook, NY 11794-4310
E-mail: spd@stonybrook.edu
(631) 632-7055

Master of Arts in Teaching: Mathematics

A. Program Description

The Master of Arts in Teaching: Mathematics (HEGIS 1701) is a course of study leading to New York State certification for teaching Mathematics in the secondary schools (grades 7-12). This program, offered in collaboration with the University's Department of Mathematics and Professional Education Program, is designed for those who have little or no previous coursework in education or formal classroom teaching experience.

B. Course of Study

The degree program consists of 42 credits, distributed among the areas listed below. Unless otherwise noted, each course is three credits.

Mathematics Content Courses (12 credits)

Course selection will be determined by the student and advisor. Students who have academic deficiencies in Mathematics will be required to include courses that specifically address these deficiencies. These courses will be part of the 12 credits selected to satisfy this requirement. If additional deficiencies exist, those credits required to meet these mandates will be over and above those requirements for the degree.

MAT 511 Fundamental Concepts of Mathematics (required of all students in this program), plus nine additional credits selected from the following:

- AMS 504 Foundations of Applied Mathematics
- AMS 507 Introduction to Probability
- AMS 572 Data Analysis I
- MAT 512 Algebra for Teachers
- MAT 513 Analysis for Teachers I
- MAT 514 Analysis for Teachers II
- MAT 515 Geometry for Teachers
- MAT 516 Probability and Statistics for Teachers
- MAT 530 Topology/Geometry I
- MAT 534 Algebra I
- MAT 542 Complex Analysis I
- MAT 544 Analysis
- MAT 550 Real Analysis I
- MAT 599 Masters Level Independent Study

Professional Studies in Education (24 credits)

CEE 505 Education: Theory and Practice

CEE 565 Human Development

LIN 544 Language Acquisition and Literacy Development

MAE 501 Foundations of the Secondary School Mathematics Curriculum

MAE 510 Introduction to Methods of Teaching and Learning Standards (pre- or co-requisite: MAE 501)

MAE 520 Advanced Methods of Teaching Secondary School Mathematics (prerequisites: MAE 501 and 510)

MAE 530 Directed Readings in Mathematics Education (prerequisites: MAE 510 and 520; co-requisite: MAE 540); 1 credit

MAE 540 Clinical Experience (prerequisites: MAE 510 and 520; co-requisite: MAE 530); 2 credits

MAE 554 Student Teaching Seminar (prerequisites: CEE 505, CEE 565, LIN 544, MAE 501, MAE 510, MAE 520, MAE 530, MAE 540, satisfaction of all content requirements and permission of the Director of Mathematics Education; co-requisites: MAE 551 and 552)

Field Experience and Clinical Practice

Students will be required to complete 100 clock hours of field experience related to coursework prior to student teaching or practica. These experiences include practicing skills for interacting with parents, experiences in high-need schools, and experiences with each of the following student populations: socio-economically disadvantaged students, students who are English language learners, and students with disabilities.

Supervised Student Teaching (6 credits)

MAE 551 Supervised Student Teaching Middle School Grades 7-9: Mathematics (prerequisites: CEE 505, CEE 565, LIN 544, MAE 501, MAE 510, MAE 520, MAE 530, MAE 540, satisfaction of all content requirements and permission of the Director of Mathematics Education; co-requisites: MAE 552 and 554)

MAE 552 Supervised Student Teaching High School Grades 10-12: Mathematics (prerequisites: CEE 505, CEE 565, LIN 544, MAE 501, MAE 510, MAE 520, MAE 530, MAE 540, satisfaction of all

content requirements and permission of the Director of Mathematics Education; co-requisites: MAE 551 and 554)

Written Project

Students will be required to complete a four-week Mathematics teaching module specifically designed for the Supervised Student Teaching project.

C. Admissions Requirements

Students must have completed an academic major in mathematics or applied mathematics or the equivalent (see below) with a minimum of 36 credits in mathematics with a minimum GPA of 2.75 in their overall bachelor's degree program and a minimum GPA of 3.00 in mathematics. These 36 credits must include courses in single and multivariable calculus, linear algebra, and at least two of the following four more advanced subjects: abstract and/or applied algebra; analysis or advanced calculus; geometry, including non-Euclidean geometry; probability and/or statistics. Students must also have taken at least one mathematics course that significantly uses computers and/or graphing calculators. Students must demonstrate, through their application and recommendations, that they possess the temperament and disposition to be an effective teacher.

Students' academic transcripts must indicate that they have completed at least one year of college-level study of a foreign language. This may include American Sign Language.

Application Procedure

Applications and instructions are available on SPD's Web site at www.sunysb.edu/spd/graduate/index.html. Students may also call (631) 632-7055 to obtain an application packet. Return the completed packet to SPD. Applications and supporting documentation (including GRE's) for the spring term must be received by November 15; for the fall term, by April 15. A completed packet consists of:

Completed MAT application with a \$100 non-refundable application fee;

Three letters of recommendation;

Official copies of all previous college transcripts;

Official report of scores on the Graduate Record Examination (General Test);
Immunization Record.

Teacher Certification

While NYSED requires a minimum of 30 credits in the content field in order to be certified, Stony Brook requires that students must have completed an undergraduate degree with a major in the content field, and a minimum of 36 credits, for admission to the MAT program. This major must be equivalent to a similar major at Stony Brook. In addition, academic transcripts must indicate that the student has completed at least one year of college-level study of a foreign language. In order to be recommended for New York State certification, students must complete all courses required for the MAT plus any ancillary requirements. Students must also achieve a minimum grade of B in all pedagogy courses.

Contact Information

Please contact one of the following:

Bernard Maskit, Program Director
MAT in Mathematics
E-mail: bernie@math.sunysb.edu
(631) 632-8257

Professional Education Program
(631) 632-4PEP

School of Professional Development
Stony Brook University
Stony Brook, NY 11794-4310
E-mail: spd@stonybrook.edu
(631) 632-7055

Master of Arts in Teaching: Science

A. Program Description

The Master of Arts in Teaching (MAT): Biology, Chemistry, Earth Science, or Physics programs are designed to lead to New York State certification for teaching in the secondary schools (grades 7-12). The programs are offered in collaboration with the University's Departments of Biochemistry and Cell Biology, Chemistry, Geosciences, Physics, and the Professional Education Program. They are designed for those who have little or no previous coursework in education or formal classroom teaching experience.

B. Course of Study

These degree programs consist of 41 credits, distributed among the areas listed below. Unless otherwise noted, each successfully completed course fulfills three credits.

Graduate Science Courses (15 credits)

Courses are selected with the approval of a departmental advisor. Listed below are samples of typical programs.

Biology (HEGIS 0401)

Three courses from the following list:

CEB 546 Current Topics in Biotechnology

CEB 547 Current Topics in Molecular Genetics

CEB 548 Current Topics in Immunology

CEB 553 Biology and Human Behavior

CEB 556 Ecology

Plus two graduate-level courses selected in concert with an academic advisor.

Chemistry (HEGIS 1905)

CHE 501 Instrumental Methods in Chemistry

CHE 504 Structure and Reactivity in Organic Chemistry

CHE 507 Biomolecular Structure and Reactivity

CHE 511 Structural Inorganic Chemistry

CHE 590 Master's Term Paper

Earth Science (HEGIS 1917)

GEO 543 Stratigraphy

GEO 546 Mineralogy and Petrology

GEO 549 Structural Geology

GEO 585 Directed Studies

MAR 527 Global Change

Physics (HEGIS 1902)

PHY 525 Current Research Instrumentation

PHY 585 Special Study: Optics and Waves

PHY 585 Special Study: Introductory Quantum Mechanics

PHY 585 Special Study: Electromagnetic Theory

Plus one graduate course selected in concert with an academic advisor.

Professional Studies in Education (20 credits)

CEE 505 Education: Theory and Practice

CEE 565 Human Development

SCI 510 Introduction to Science Teaching

SCI 520 Science Teaching Methods (prerequisite: SCI 510)

SCI 549 Clinical Experience I (co-requisite: SCI 510)

SCI 550 Clinical Experience II (prerequisites: SCI 510 and 549; co-requisite: SCI 520)

SCI 554 Student Teaching Seminar (prerequisites: SCI 510, 520, 549, and 550; co-requisites: SCI 551 and 552)

LIN 544 Language Acquisition and Literacy Development

Field Experience and Clinical Practice

Students are required to complete 100 clock hours of field experience related to coursework prior to student teaching or practica. These experiences include practicing skills for interacting with parents, experiences in high-need schools, and experiences with each of the following student populations: socio-economically disadvantaged students, students who are English language learners, and students with disabilities.

Supervised Student Teaching (6 credits)

SCI 551 Supervised Student Teaching High School Grades 10-12: Science (prerequisites: SCI 510, 520, 549, and 550; co-requisites: SCI 552 and 554)

SCI 552 Supervised Student Teaching Middle School Grades 7-9: Science (prerequisites: SCI 510, 520, 549, and 550; co-requisites: SCI 551 and 554)

Final Project

Students are required to submit a professional portfolio at the completion of the program.

C. Admissions Requirements

Students must have completed an undergraduate course of study that is substantially the equivalent to that of a Stony Brook undergraduate degree program in the science for which they seek certification. They must also have achieved a minimum overall GPA of 2.75 in their overall bachelor's degree program, and have a minimum GPA of 3.00 in science courses. Students must demonstrate, through their application and recommendations, that they possess the temperament and disposition to be an

effective teacher. In addition, academic transcripts must indicate that the student has completed at least one year of college-level study of a foreign language. Applications and supporting documentation (including GRE's) for the spring term must be received by November 15; for the fall term, by April 15.

Students must first consult with the appropriate MAT departmental advisor to determine whether they should proceed with the application process.

Departmental Program Advisors
Biology: Zuzana Zachar
(631) 632-8970
zzachar@ms.cc.sunysb.edu

Chemistry: Robert Kerber
(631) 632-7940
Robert.Kerber@stonybrook.edu

Geosciences: Gilbert Hanson
(631) 632-8210
Gilbert.Hanson@stonybrook.edu

Physics: Robert McCarthy
(631) 632-8086
mccarthy@sbhep1.physics.sunysb.edu

Application Procedure

Applications and instructions are available on SPD's Web site at www.sunysb.edu/spd/graduate/index.html. Students may also call (631) 632-7055 to obtain an application packet. Return the completed packet to SPD. A completed packet consists of:

- Completed MAT application with a \$100 non-refundable application fee;

- Three letters of recommendation;

- Official copies of all previous college transcripts;

- Official report of scores on the Graduate Record Examination (General Test);

- Immunization Record.

Teacher Certification

While NYSED requires a minimum of 30 credits in the content field in order to be certified, Stony Brook requires that students must have completed an undergraduate degree with a major in the content field, and a minimum of 36 credits, for admission to the MAT program. This major must be equivalent to a similar major at Stony Brook. In addition, academic transcripts must indicate that the student has completed at least one year of college-level study of a foreign language. In order to be

recommended for New York State certification, students must complete all courses required for the MAT plus any ancillary requirements. Students must also achieve a minimum grade of B in all pedagogy courses.

Contact Information

Please contact one of the following:

The appropriate science departmental program advisor as noted above
Professional Education Program
(631) 632-4PEP

School of Professional Development
Stony Brook University
Stony Brook, NY 11794-4310
E-mail: spd@stonybrook.edu
(631) 632-7055

Master of Arts in Teaching: Social Studies

A. Program Description

The program leads to New York State certification for teaching social studies in the secondary schools (grades 7-12). The program, offered in collaboration with the University's Department of History and the Professional Education Program, was designed for those who have little or no previous coursework in education or formal classroom teaching experience.

B. Course of Study

The program consists of 41 credits, distributed among the areas listed below. Unless otherwise noted, each course counts for three credits.

History (15 credits)

HIS 500 Historiography

Plus 12 credits selected from the following courses:

CEG 532 U.S. History to Civil War

CEG 522 U.S. History Since Civil War

CEG 516 Early Modern Europe

CEG 524 Late Modern Europe

HIS 541 Colonial Latin America

CEG 517 Modern Latin America

CEG 534 Topics Seminar: Africa

CEG 534 Topics Seminar: Asia

CEJ 501 Traditional China: Culture and Society

CEJ 502 Modern China: Culture and Society

Professional Studies in Education (15 credits)

CEE 505 Education: Theory and Practice

CEE 565 Human Development

CEE 577 Teaching Social Studies (co-requisite: CEF 548)

CEE 578 Social Studies Strategies (prerequisites: CEE 577 and CEF 548; co-requisite: CEF 549)

CEF 548 Field Experience I—Grades 7-9 (co-requisite: CEE 577)

CEF 549 Field Experience II—Grades 10-12 (prerequisites: CEE 577 and CEF 548; co-requisite: CEE 578)

CEE 580 Student Teaching Seminar (prerequisites: CEE 577 and 578, CEF 548 and 549; co-requisites: CEQ 581 and 582)

LIN 544 Language Acquisition and Literacy Development

Field Experience and Clinical Practice

Students are required to complete 100 clock hours of field experience related to coursework prior to student teaching or practica. These experiences include practicing skills for interacting with parents, experiences in high-need schools, and experiences with each of the following student populations: socio-economically disadvantaged students, students who are English language learners, and students with disabilities.

Supervised Student Teaching (6 credits)

CEQ 581 Supervised Student Teaching High School Grades 10-12 (prerequisites: CEE 577 and 578, CEF 548 and 549; co-requisites: CEE 580 and CEQ 582)

CEQ 582 Supervised Student Teaching Middle School Grades 7-9 (prerequisites: CEE 577 and 578, CEF 548 and 549; co-requisites: CEE 580 and CEQ 581)

Final Project

Students are required to submit a professional portfolio at the completion of the program.

C. Admissions Requirements

Students must have completed an academic major (a minimum of 36 credits) in history or within another social science major (excluding psychology, education, and linguistics) and at least 18 credits of history, with 9 of these credits at the

upper division level. Transcripts must show a minimum GPA of 2.75 in the overall bachelor's degree program, and a minimum GPA of 3.00 in the content field. Students must demonstrate, through their application and recommendations, that they possess the temperament and disposition to be an effective teacher. Applications and supporting documentation (including GRE's) for the spring term must be received by November 15; for the fall, by April 15.

Application Procedure

Applications and instructions are available on SPD's Web site at www.sunysb.edu/spd/graduate/index.html. Students may also call (631) 632-7055 to obtain an application packet. Return the completed packet to SPD. A completed packet consists of:

Completed MAT application with a \$100 non-refundable application fee;

Three letters of recommendation;

Official copies of all previous college transcripts;

Official report of scores on the Graduate Record Examination (General Test);

Immunization Record.

Teacher Certification

Students in the MAT program must also satisfy the following required areas of study. These requirements may be met by either the graduate courses taken toward the MAT degree or by undergraduate coursework. Equivalent undergraduate courses will normally be accepted. In addition, a cluster of undergraduate courses may be accepted as evidence of satisfaction of individual standards. Undergraduate transcripts will be evaluated on an individual basis. However, the student will bear the burden of proof of showing that such coursework does provide a broad introductory knowledge of the area of study.

1. U.S. History to 1877
2. U.S. History since 1877
3. Western Civilization or European History Survey
4. Latin America—Survey of the history or politics of the region or one of the major countries of the region
5. Asia—Survey of the history or

politics of the region or one of the major countries of the region

6. Africa—Survey of the history or politics of the region or one of the major countries of the region

7. Principles of Economics

8. Human Geography

9. The Culture Concept in Theory or History—may be satisfied by courses in cultural anthropology or by dealing with cultural differences and conflicts in the contemporary world

10. American Government and Politics

11. Science, Technology, and Society

Important Note: The History Department does not offer graduate courses that satisfy requirements in areas 7–11. These requirements will have to be satisfied through undergraduate courses.

The MAT consists of at least three semesters of work (excluding summer session) for the full-time student and a somewhat longer period of time for the part-time student.

Contact Information

Please contact one of the following:

Lawrence Frohman, Program Director
MAT in Social Studies
Lawrence.Frohman@stonybrook.edu
(631) 632-7686

Professional Education Program
(631) 632-4PEP

School of Professional Development
Stony Brook University
Stony Brook, NY 11794-4310
E-mail: spd@stonybrook.edu
(631) 632-7055

Master of Arts in TESOL

A. Program Description

The Master of Arts in TESOL (HEGIS 1508) is a course of study leading to New York State certification for teaching English to Speakers of Other Languages in the elementary and secondary schools (grades P-12). This program, which is offered in collaboration with the University's Department of Linguistics and the Professional Education Program, is designed for those who have little or no previous coursework in education or formal classroom teaching experience.

B. Course of Study

This degree and certification program consists of 45 credits distributed among the areas listed below. All courses are three credits except for the one-credit fieldwork courses (LIN 578, LIN 579).

Linguistics and Foundation (15 credits)

LIN 522 Phonetics

LIN 530 Intro to General Linguistics

LIN 541 Bilingualism

LIN 532 Second Language Acquisition

and one of the following:

LIN 542 Sociolinguistics

LIN 525 Contrastive Analysis

LIN 526 Analysis of an Uncommonly Taught Language

LIN 555 Error Analysis

Professional Studies in Education (24 credits)

CEE 505 Education: Theory and Practice

CEE 565 Human Development

LIN 524 TESOL Pedagogy: Theory and Practice and LIN 579 Field Experience N-12

LIN 529 Content-based Language and Literacy Development and LIN 579 Field Experience N-12

LIN 527 Structure of English

LIN 571 Curriculum Design and Evaluation and LIN 578 Field Experience in Adult and Tertiary Contexts

LIN 574 Managing Instruction, Assessment, and Resources

Field Experience and Clinical Practice

Students are required to complete 100 clock hours of field experience (LIN 579) related to coursework prior to student teaching. These experiences include practicing skills for interacting with parents, experiences in high-need schools, and experiences with each of the following student populations: socio-economically disadvantaged students, students who are English language learners, and students with disabilities. LIN 574, 581, and 582 are co-requisites and cannot be taken until completion of all other course and ancillary requirements.

Supervised Student Teaching (6 credits)

LIN 581 Supervised Student Teaching Grades N-6

LIN 582 Supervised Student Teaching Grades 7-12

Final Project

Students are required to submit a professional portfolio at the completion of the program.

C. Admissions Requirements

Students must have completed an undergraduate degree in a liberal arts or science major with a minimum GPA of 3.00 in the overall bachelor's degree. Students must demonstrate, through their application and recommendations, that they possess the temperament and disposition to be an effective teacher. In order to be recommended for New York State certification, students must complete all courses required for the MA TESOL. In addition, transcripts must indicate completion of at least two years of college-level study of a language other than English (this may include American Sign Language).

Application Procedure

Applications and instructions are available on the Graduate School Web site at *www.grad.sunysb.edu*. You may also call (631) 632-7774 to obtain an application packet. Return the completed packet to the Department of Linguistics. A completed packet consists of:

Completed Graduate School application with a non-refundable \$100 application fee;

Three letters of recommendation;

Official copies of all previous college transcripts;

Official report of scores on the Graduate Record Examination (General Test);

Curriculum Vitae (Resume);

A writing sample.

Admission is competitive and no single factor will exclude anyone from being admitted. Similarly, no single factor will ensure admission.

The MA TESOL consists of approximately four semesters of study (excluding summer session) for the full-time

student and a somewhat longer period of time for the part-time student.

Applications and supporting documentation (including GRE results) for the fall semester must be received by March 1.

Teacher Certification

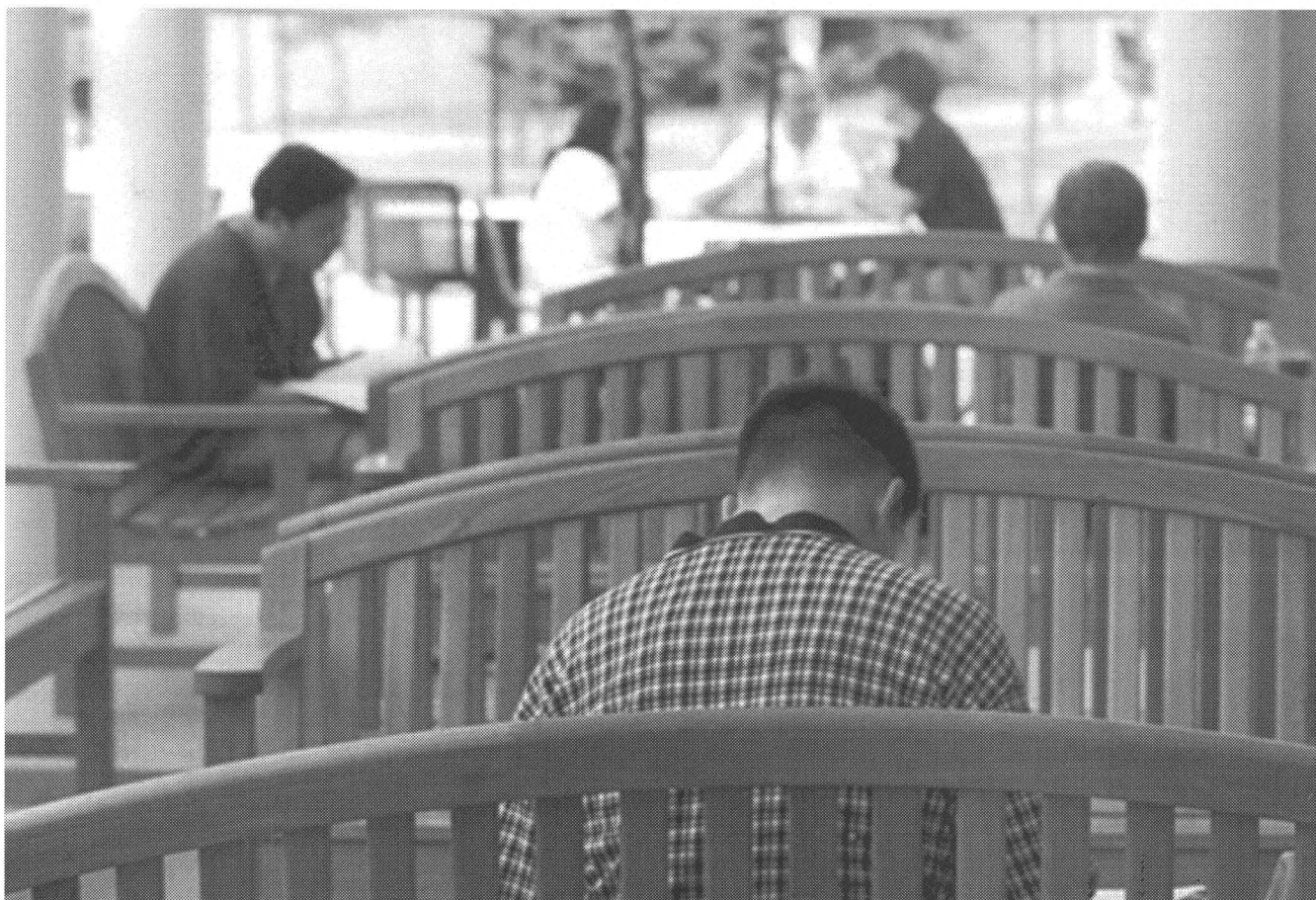
In order to be recommended for New York State certification, students must complete all courses required for the M.A. plus any ancillary requirements. Students must also achieve a minimum grade of B in all pedagogy courses.

Contact Information

Please contact one of the following:

Dorit H. Kaufman, Program Director
M.A. in TESOL
Dorit.Kaufman@stonybrook.edu
(631) 632-7783

Professional Education Program
(631) 632-4PEP



Electrical and Computer Engineering (ESE)

Chairperson: Serge Luryi, Light Engineering Building 273 (631) 632-8420

Graduate Program Director: Yuanyuan Yang, Light Engineering Building 215 (631) 632-8400/8474

Senior Staff Assistant: Maria Krause, Light Engineering Building 273 (631) 632-8420

Graduate Program Coordinator: Deborah Kloppenburg, Light Engineering Building 267A (631) 632-8400

Degrees awarded: M.S. in Electrical Engineering; Ph.D. in Electrical Engineering

The fields of electrical and computer engineering are in an extraordinary period of growth; new application areas and increased expectations are accelerating due to new technologies and decreased costs. The Electrical and Computer Engineering (ECE) Department, in the College of Engineering and Applied Sciences, is involved in graduate teaching and research in many of these areas, including telecommunications, computer networks, computer architecture, signal processing, pattern recognition and machine vision, computer graphics, systems and controls, robotics, microprocessors, network theory, electronic circuits and devices, and VLSI. The department has laboratories devoted to research and advanced teaching in the following areas: computing, networking, engineering design methodology, parallel and neural processing, machine vision, fiber optic sensors and computer graphics, micro and optoelectronics/VLSI, tele-robotics, DNA sequencing, digital signal processing, and telecommunications.

Since Long Island contains one of the highest concentrations of engineering-oriented companies in the country, the department is particularly strongly committed to meeting the needs of local industry. As part of this commitment, most graduate courses are given in the late afternoon or evening, so as to be available to working engineers on Long Island.

The value of this commitment to industry is evidenced by the support received by the department in return; in particular, from Lucent Technologies, AT&T, Westinghouse, Intel Corporation, and Texas Instruments.

The Department of Electrical and Computer Engineering offers graduate programs leading to the M.S. and Ph.D. degrees. Graduate programs are tailored to the needs of each student to provide a strong analytical background helpful to the study of advanced engineering problems. Ample opportunities exist for students to initiate independent study and to become involved in active research programs, both experimental and theoretical.

Areas of Emphasis in Graduate Study

Areas of emphasis in current research and instruction are Communications and Signal Processing, Computer Engineering, Semiconductor Devices and Quantum Electronics, Circuits, and VLSI.

Specialties that fall under one or more of the above categories include VLSI, Image Processing, Computer Vision, Integrated Circuit Fabrication, Novel Electronic Devices, Digital Communication, Biomedical Electronics, Computer-Aided Design, Computer Networks, Parallel Processing, Microprocessors, Network Theory, Optical Signal Processing, and Fiber Optic Sensors. Theoretical and experimental programs reflecting these areas are underway and students are encouraged to participate actively in these efforts. Outlined below is an overview of the Department's research areas.

Communications and Signal Processing

Subject areas of current interest include mobile, wireless, and personal communications; high speed data and computer communication networks; communications traffic; data compression; coding and modulation techniques; digital communication; detection and estimation; statistical signal processing; spectrum estimation; image analysis and processing; computer vision.

Computer Engineering

The goal of computer engineering in the ECE department is to provide a balanced view of hardware and software issues. The areas of expertise in the program include parallel and distributed computing, interconnection networks and high speed packet switching, computer networks, high performance computer architecture, embedded microprocessor system design, fault tolerant computing, communications and signal processing, computer vision, artificial neural networks, and software engineering.

Semiconductor Devices and Quantum Electronics

The program of courses and research pertinent to solid-state electronics, electromagnetics, and optics ranges from a study of the fundamental electronic processes in solids and gases through a description of the mechanism that yields useful devices to a study of the design simulation and fabrication of integrated circuits. The program's scientific interests center on physics, characterization, and development of optoelectronic devices and systems. Over the past several years, major efforts have focused on the studies of physics of semiconductor lasers and detectors. The department is also heavily involved in developing coherent optical processors, fiber optic sensors, and integrated fiber optics.

Circuits and VLSI

The program in the Circuits and VLSI area addresses problems associated with modeling, simulation, design, and fabrication of analog, digital, and mixed-signal integrated circuits. Analog and mixed-mode integrated circuit (IC) devices have important applications in many fields including avionics, space technology, and medical technology. The department offers basic and advanced courses covering the following subjects: integrated circuit technology; device modeling; software tools for circuit design and simulation; analog circuit design; VLSI circuits; testing of analog and digital ICs; design automation for analog, digital, and mixed-mode circuits; VLSI systems for communications and signal processing.

Facilities

The department operates laboratories for both teaching and research:

The Advanced IC Design and Simulation Laboratory contains equipment and computing facilities for the design, simulation, and characterization of analog, digital, and mixed-signal integrated circuits. The lab is equipped with several SUN workstations and

PCs, and assorted electronic measurement equipment.

The Communications, Signal Processing, and Networking (COSINE) Laboratory is equipped with modern computers with specialized software for research in telecommunications, signal processing, and networks. The computers are connected to departmental computing facilities allowing access to shared campus resources and the Internet.

The Computer-Aided Design Laboratory provides a network of 386 based workstations. Advanced computer-aided design software for analog and digital systems design is available on these workstations.

The Computer Vision Laboratory has state-of-the-art equipment for experimental research in three-dimensional machine vision. The facilities include desktop computers, imaging hardware, and printers.

The Digital Signal Processing Research Laboratory is involved in digital signal processing architectures and hardware and software research. The laboratory is presently active in the development of algorithms to be implemented on a variety of signal processing chips.

The Fluorescence Detection Laboratory is involved in the design, development, implementation, and testing of various DNA sequencing instruments. Research areas include laser-induced fluorescence detection, single photon counting techniques, fast data acquisition and transfer, design and development of analog and digital integrated circuits, signal processing, capillary electrophoresis phenomena, and DNA sequencing.

The Graduate Computing Laboratory has 12 Windows 2000 Professional based Windows PC's, equipped with Microsoft Office XP, Microsoft Visual Studio, X-Windows for UNIX connectivity, Adobe Acrobat reader, Ghost script and Ghost view. There is an HP LaserJet 5Si/MX printer. The lab is also equipped with eight Sun Blade 100 machines. These machines run Sun Solaris 8 operating systems and are connected to the departmental UNIX servers. Industry standard packages such as Cadence tools, Synopsys, Hspice, and Matlab are available from the application servers.

The High Performance Computing and Networking Research Laboratory is equipped to conduct experimental

research in the broad area of networking, including wireless/mobile networks, optical networks, interconnection networks, and multicast communication. The laboratory has one Dell PowerEdge 1800 server, nine Dell OPTiPlex Gx620MT PCs, one Sun Ultra workstation with dual processors, and four Sun Ultra 5 workstations. All machines are networked.

The Medical Image Processing Laboratory, located in the Medical School, is involved in research in image reconstruction methods and image analysis with applications to medical imaging. It is well equipped for high-speed computing with SUN-UNIX and Linux desktops as well as high-performance 20-node cluster.

The Fiber Optic Sensors Laboratory research emphasis is on the development and fabrication of novel fiber optic systems for very diverse applications ranging from aerospace to biomedical projects involving the development of new techniques and algorithms. Some of the current research projects include development capillary waveguide based biosensors for detection of pathogens in a marine environment, integrated fiber optic based systems for real time detection of synchronous and asynchronous vibrations in turbomachinery, and single photon based detection schemes for sub-microscopic particle sizing. Equipment includes a fiber optic fusion splicer, fiber polisher, diamond saw, optical microscope, optical spectrometer (visible range), micropositioners, optical scanners, and various laser sources. Additionally, the laboratory has the facilities for designing printed circuits and fabricating optical and electronic sub-systems.

The Parallel and Neural Processing Laboratory conducts research in various parallel and neural network applications. Current research projects include natural adaptive critic control, pattern recognitions, and Bayesian Neural Networks. It is equipped with Pentium PCs and Synapse3 parallel neural network processing boards.

The Petaflops Design Laboratory is a research facility equipped with two SUN workstations, several PCs with Linux, and a 16-processor Beowulf-type cluster. All computers are connected by Fast 100 Mb/sec Ethernet LAN.

The Semiconductor Optoelectronics Laboratory possesses the infrastructure for wafer processing, testing, and

sophisticated characterization of optoelectronics devices. Processing facilities are based on a "Class 100" clean room with Darl Suss aligner, Temescal metal film deposition system, and other equipment required for modern semiconductor wafer processing. Wafer testing can be performed by low and high temperature probe-stations. Characterization of devices after processing includes electrical, optical, and spectral measurements. Electrical and optical measurements can be carried out within a wide frequency range from CW to 22GHz. Semiconductor laser near and far field emission patterns can be studied in a wide spectral range from visible to mid-infrared. Spectral analysis of radiation is performed with high resolution and sensitivity using grating and two Fourier transform spectrometers in combination with state-of-the-art detector systems. Time resolved luminescence experiments are available with ns resolution. The laboratory is equipped with 150fs Nd-glass mode locked laser for optical pumping as well as other pump sources including a high energy Q-switched Nd solid-state laser. New experimental methods of studying semiconductor laser parameters, developed in the laboratory, include direct heterobarrier leakage current measurements as well as gain, loss, and alpha-factor measurements in broad area and single mode lasers.

Admission

For admission to graduate study in the Department of Electrical and Computer Engineering the minimum requirements are:

A. A bachelor's degree in electrical engineering from an accredited college or university; outstanding applicants in other technical or scientific fields will be considered, though special make-up coursework over and above the normal requirements for a graduate degree may be required;

B. A minimum grade point average of B in all courses in engineering, mathematics, and science;

C. Official results of the Graduate Record Examination (GRE) General Test;

D. Acceptance by both the Department of Electrical and Computer Engineering and the Graduate School.

Faculty

Distinguished Professors

Luryi, Serge, Chairperson. Ph.D., 1978, University of Toronto, Canada: Solid-state electronic devices.

Marsocci, Velio A., Emeritus. Eng.Sc.D., 1964, New York University: Solid-state electronics; integrated electronics; biomedical engineering.
Zemanian, Armen H., Eng.Sc.D., 1953, New York University: Network theory; computational methods; VLSI modeling.

Professors

Belenky, Gregory, Doctor of Physical and Mathematical Sciences, 1979, Institute of Physics, Baku, USSR: Design, manufacturing, and characterization of optoelectronic and microelectronic semiconductor devices; physics of semiconductors and semiconductor devices.

Chang, Sheldon S.L., Emeritus. Ph.D., 1947, Purdue University: Optimal control; energy conservation; information theory; economic theory.

Chen, Chi-Tsong, Ph.D., 1966, University of California, Berkeley; CA systems and control theory.

Djuric, Petar M., Ph.D., 1990, University of Rhode Island: Signal processing; signal and systems modeling.

Parekh, Jayant P., Ph.D., 1971, Polytechnic Institute of Brooklyn: Microwave acoustics; microwave magnetics; microwave electronics; microcomputer applications.

Robertazzi, Thomas G., 1981, Princeton University: Computer communications; performance evaluation; parallel processing; e-commerce technology.

Shamash, Yacov, Dean of the College of Engineering and Applied Sciences. Ph.D., 1973, Imperial College of Science and Technology, England: Control system; robotics.

Short, Kenneth L., Ph.D., 1973, Stony Brook University: Digital system design; microprocessors; instrumentation.

Subbarao, Murali, Ph.D., 1986, University of Maryland: Machine vision; image processing; pattern recognition.

Tuan, Hang-Sheng, Ph.D., 1965, Harvard University: Electromagnetic theory; integrated optics; microwave acoustics.

Yang, Yuanyuan, Graduate Program Director. Ph.D., 1992, Johns Hopkins University: Wireless networks; optical networks; high speed networks; parallel and distributed computing systems; multicast communication; high performance computer architecture; and computer algorithms.

Associate Professors

Dhadwal, Harbans, Ph.D., 1980, University of London, England: Laser light scattering; fiber optics; signal processing and instrumentation.

Dorojevets, Mikhail, Ph.D., 1988 Siberian Division of the USSR Academy of Sciences, Novosibirsk: Computer architectures, systems design.

Gindi, Gene, Ph.D., 1981, University of Arizona: Medical image processing; image analysis.

Gorfinkel, Vera, Ph.D., 1980, A.F. Ioffe Physical-Technical Institute, St. Petersburg, Russia: Semiconductor devices, including microwave and optoelectronics; DNA sequencing instrumentation; single photon counting techniques.

Kamoua, Ridha, Ph.D., 1992, University of Michigan: Solid-state devices and circuits; microwave devices and integrated circuits.

Murray, John, Ph.D., 1974, University of Notre Dame: Signal processing; systems theory.

Sussman-Fort, Stephen E., Ph.D., 1978, University of California, Los Angeles: RF and microwave circuits; computer-aided circuit design; active and passive filters; classical network theory.

Tang, K. Wendy, Ph.D., 1991, University of Rochester: Interconnection networks, parallel computing, and neural networks.

Assistant Professors

Doboli, Alex, Ph.D., 2000, University of Cincinnati: VLSI CAD and design; synthesis and simulation of mixed analog-digital systems; hardware/software co-design of embedded systems; high-level synthesis of digital circuits.

Donetski, Dmitri, Ph.D., 2000, Stony Brook University; 1996, St. Petersburg State Technical University, Russia: Design and technology of optoelectronic devices and systems.

Fernandez-Bugallo, Monica, Ph.D., 2001, Universidad da Coruna (Spain): Statistical signal processing with emphasis in the topics of Bayesian analysis; sequential Monte Carlo methods; adaptive filtering; and stochastic optimization.

Hong, Sangjin, Ph.D., 1999, University of Michigan: Low-power VLSI design of multimedia wireless communications and digital signal processing systems, including SOC design methodology and optimization.

Stanacevic, Milutin, Ph.D., 2005, Johns Hopkins University: Analog and mixed-signal VLSI integrated circuits and systems; adaptive Microsystems; implantable electronics.

Wang, Xin, Ph.D., 2001, Columbia University: Mobile and ubiquitous computing; wireless communications and networks; grid and distributed computing; advanced applications and services over Internet and wireless networks.

Number of teaching, graduate, and research assistants, fall 2005: 49

Degree Requirements

Requirements for the M.S. Degree

The M.S. degree in the Department of Electrical and Computer Engineering requires the satisfactory completion of a minimum of 30 graduate credits. These requirements may be satisfied by either one of the two following options:

I. M.S. Non-Thesis Option

A. At least 30 graduate credits with a cumulative and departmental grade point average of 3.0 or better. Among these 30 credits, up to six credits may be ESE 597, ESE 599, or ESE 698. Only three of the six credits may be from ESE 698. All non-ESE courses that you wish to use toward your degree must receive prior approval from the graduate program director unless they are on the department's pre-approved list.

B. Minimum of eight regular courses with at least a 3.0 grade point average. Of these eight, at least seven regular courses must be in the Department of Electrical and Computer Engineering; three of the seven must be selected from the following: ESE 502, ESE 503, ESE 511, ESE 520, ESE 528, ESE 545, ESE 554 or ESE 555.

C. ESE 597, ESE 599, ESE 698, and ESE 699 are not counted as regular courses in item B. Courses that permit repetitive credit, such as research seminars or special topics, can be counted only once (3 or 4 credits) for item B. However, ESE 670 may be counted only once for regular course credit toward the M.S. degree, and ESE 698 may be counted only once (3 credits) for credit toward the M.S. degree.

D. Up to 12 transfer credits may be applied toward the degree with the approval of the program committee.

II. M.S. Thesis Option

A. Students must inform the department in writing at the end of their first semester if they choose the M.S. Thesis Option. At least 30 graduate credits with a cumulative and departmental grade point average of 3.0. At least six credits of ESE 599. No more than a total of 12 credits may be taken from ESE 597, ESE 599, and ESE 698. Only three of the six credits may be from ESE 698. All non-ESE courses that you wish to use toward your degree must receive prior approval from the graduate program director unless they are on the department's pre-approved list.

B. Minimum of six regular courses with at least a 3.0 grade point average. Of these six, at least four courses must be in the Department of Electrical and Computer Engineering. At least three of these four regular courses must be selected from the following: ESE 502,

ESE 503, ESE 511, ESE 520, ESE 528, ESE 545, ESE 554, or ESE 555.

C. ESE 597, ESE 599, ESE 698, and ESE 699 are not counted as regular courses in item B. Courses that permit repetitive credit, such as research seminars or special topics, can be counted only once (3 or 4 credits) for item B. However, ESE 670 may be counted only once for regular course credit toward the M.S. degree, and ESE 698 may be counted only once (3 credits) for credit toward the M.S. degree.

D. Up to 12 transfer credits may be applied toward the degree with the approval of the program committee.

E. Satisfactory completion of a thesis.

Requirements for the Ph.D. Degree

A. Qualifying Examination

There is a major and minor part to the qualifying examination. The written examination is offered once every year, in April. Students must pass one major written examination in two consecutive tries. The two consecutive tries do not need to be in the same area. The minor requirement can be satisfied by taking and passing a second major written examination or by taking three graduate courses in a different area than the major. Previous examinations are available in the departmental office for review, however, students must make their own copies. Please refer to the department's Graduate Student Guide for additional information on the qualifying examination.

B. Course Requirements

1. A minimum of six regular courses beyond the M.S. degree or 14 regular courses beyond the bachelor's degree. The choice must have the prior approval of the designated faculty academic advisor. ESE 697 Practicum in Teaching (3 credits) is required to satisfy the teaching requirement. Students must be G-5 status in order to take this course. The courses ESE 597, ESE 598, ESE 599, ESE 698, and ESE 699 are not counted as regular courses. Courses presented under the title ESE 670 Topics in Electrical Sciences that have different subject matters, and are offered as formal lecture courses, are considered different regular courses but may not be counted more than once as a regular course for credit toward the M.S. degree, and not more than

twice for all graduate degrees awarded by the Department of Electrical and Computer Engineering.

2. The student must satisfy the stipulations of a plan of study which must be filed with the graduate program committee within six months after the student passes the qualifying examination. The study plan, which will include the six regular courses as required in item 1, will be developed under the aegis of the designated faculty advisor (who may or may not be the eventual thesis advisor). Modification of the study plan may be made by the preliminary examination committee and at any later time by the thesis advisor. An up-to-date plan must always be placed on file with the graduate program committee each time a modification is made.

C. Preliminary Examination

A student must pass the preliminary examination not more than 18 months after passing the qualifying examination. Both a thesis topic and the thesis background area are emphasized.

D. Advancement to Candidacy

After successfully completing all requirements for the degree other than the dissertation, the student is eligible to be recommended for advancement to candidacy. This status is conferred by the dean of the Graduate School upon recommendation from the chairperson of the department. Students must advance one year prior to the dissertation defense.

E. Dissertation

The most important requirement for the Ph.D. degree is the completion of a dissertation, which must be an original scholarly investigation. The dissertation must represent a significant contribution to the scientific and engineering literature, and its quality must be compatible with the publication standards of appropriate and reputable scholarly journals.

F. Approval and Defense of Dissertation

The dissertation must be orally defended before a dissertation examination committee, and the candidate must obtain approval of the dissertation from this committee. The committee must have a minimum of four members (at least three of whom are faculty members from the department), including the research advisor, at least one person

from outside the department, and a committee chair. (Neither the research advisor nor the outside member may serve as the chair). On the basis of the recommendation of this committee, the dean of engineering and applied sciences will recommend acceptance or rejection of the dissertation to the dean of the Graduate School. All requirements for the degree will have been satisfied upon the successful defense of the dissertation.

G. Residency Requirement

The student must complete two consecutive semesters of full-time graduate study. Full-time study is 12 credits per semester until 24 graduate credits have been earned. After 24 graduate credits have been earned, the student may take only nine credits per semester for full-time status.

H. Time Limit

All requirements for the Ph.D. degree must be completed within seven years after completing 24 credits of graduate courses in the department.

Courses

ESE 501 System Specification and Modeling

A comprehensive introduction to the field of System-on-Chip design. Introduces basic concepts of digital system modeling and simulation methodologies. Various types of hardware description language (HDL) will be studied, including Verilog, VHDL, and SystemC. Topics include top-down and bottom-up design methodology, specification language syntax and semantics, RTL, behavioral and system-level modeling, and IP core development. Included are three projects on hardware modeling and simulation.

Fall, 3 credits, ABCF grading

ESE 502 Linear Systems

Development of transfer matrices and state-space equations from the concepts of linearity, time-invariance, causality, and lumpedness. Op-amp circuit implementations. Solutions and equivalent state equations. Companion and modal forms. Stability and Lyapunov equations. Controllability, observability, and their applications in minimal realization, state feedback, and state estimators. Coprime fraction of transfer functions and their designs in pole-placement and model matching. Both the continuous-time and discrete-time systems will be studied.

Fall, 3 credits, ABCF grading

ESE 503 Stochastic Systems

Basic probability concepts and application. Probabilistic bounds, characteristic functions, and multivariate distributions. Central limit theorem, normal random variables, stochastic processes in communications, control, and other signal processing systems. Stationarity, ergodicity, correlation functions,

spectral densities, and transmission properties. Optimum linear filtering, estimation, and prediction.

Fall, 3 credits, ABCF grading

ESE 504 Performance Evaluation of Communications and Computer Systems

Advanced queueing models and algorithms for communication and computer systems. Mean value analysis and convolution algorithm. Transient analysis and M/G/1 queue. Models for traffic characterization in broadband integrated networks. Buffer sizing calculations. Bursty and selfsimilar traffic.

Prerequisite: ESE 503 or permission of instructor

Spring, 3 credits, ABCF grading

ESE 505 Wireless Network

This course covers first-year graduate level material in the area of wireless communications: Wireless channels, overview of digital communications and signal processing for wireless communications, voice and data applications, design basics for wireless modems, analysis of system issues like resource management and handoff, cellular and wireless LAN systems.

Fall or spring, 3 credits, ABCF grading

ESE 506 Wireless Networking and Mobile Computing

This course will examine the area of wireless and mobile computing, looking at the unique network protocol challenges and opportunities presented by wireless communications and host or router mobility. The course will give a brief overview of fundamental concepts in mobile wireless systems and mobile computing, it will then cover system and standards issues including second generation circuit switches and third generation packet switched networks, wireless LANs, mobile IP, ad-hoc networks, sensor networks, as well as issues associated with small handheld portable devices and new applications that can exploit mobility and location information. This is followed by several topical studies around recent research publications in mobile computing and wireless networking field. This course will make the system architecture and applications accessible to the electrical engineer.

Prerequisite: ESE 505 and ESE 546 or ESE 548 or permission of instructor

Fall, 3 credits, ABCF grading

ESE 508 Analytical Foundations of Systems Theory

An exposition of the basic analytical tools for graduate study in systems, circuits, control, and signal processing. Sets and mappings, finite-dimensional linear spaces, metric spaces, Banach spaces, Hilbert spaces. The theory will be developed and exemplified in the context of systems applications such as nonlinear circuits, infinite networks, feedback control, signal restoration via projections, and optimal signal modeling.

Spring, 3 credits, ABCF grading

ESE 510 Electronic Circuits

This is a course in the design and analysis of analog circuits, both discrete and integrated. The first part of the course presents basic

topics related to circuit analysis: laws, theorems, circuit elements and transforms. Fundamental semiconductor devices are introduced next. A number of aspects of circuit design beginning with basic device functional blocks including amplifiers, oscillators and filters are discussed. Cannot be used to fulfill any ESE degree requirements.

Fall, 3 credits, ABCF grading

ESE 511 Solid-State Electronics

A study of the electron and hole processes in solids leading to the analysis and design of solid-state electronic devices. Solutions to the Schrodinger representation of quantum effects, perturbation techniques. Simple band structure, effective mass theorem. Derivation and application of the Boltzman transport theory. Electrical and thermal conductivities of metals and of semiconductors, Hall effect, thermal effects, and their application to electronic devices. Properties of semiconductors and the theories underlying the characteristics of semiconductor devices.

Fall, 3 credits, ABCF grading

ESE 512 Bipolar Junction and Heterojunction Electronic Devices

A study of fundamental properties of homojunction and heterojunction semiconductor devices. Derivation of the characteristic equation for p-n junction diodes, for the bipolar junction transistor (BJT) and for the heterojunction bipolar transistor (HBT); the device parameters for low- and high-frequency operation, the effects on the device characteristics of fabrication methods and of structural arrangements. The development of the large-signal and small-signal equivalent circuits for the p-n diode and the BJT and HPT devices, with emphasis on models used in prevalent computer-aided analysis (e.g., SPICE). Consideration of the devices in integrated-circuit applications.

Spring, 3 credits, ABCF grading

ESE 514 MOSTransistor Modeling

An overview of the metal-oxide semiconductor (MOS) transistor and its models for circuit analysis. The course is modular in structure. In a common first part, CMOS fabrication, device structure and operation are introduced. Starting from basic concepts of electrostatics, MOS field-effect transistor operation is presented in an intuitive fashion, and no advanced background in solid-state theory is required. Analytical models of increasing complexity and their SPICE Implementations are discussed. The second part of the course allows students to focus on their field of preference: device physics; digital circuits; analog circuits. The course includes a project in one of these subtopics.

Fall, 3 credits, ABCF grading

ESE 515 Quantum Electronics I

Physics of microwave and optical lasers. Topics include introduction to laser concepts; quantum theory; classical radiation theory; resonance phenomena in two-level systems; Block equations-Kramers-Kronig relation, density matrix; rate equation and amplification; CO₂ lasers; discharge lasers; semiconductor lasers.

Fall, 3 credits, ABCF grading

ESE 516 Integrated Electronic Devices and Circuits I

Theory and applications: elements of semiconductor electronics, methods of fabrication, bipolar junction transistors, FET, MOS transistors, diodes, capacitors, and resistors. Design techniques for linear digital integrated electronic components and circuits. Discussion of computer-aided design, MSI, and LSI.

Fall, 3 credits, ABCF grading

ESE 517 Integrated Electronic Devices and Circuits II

Theory and applications: elements of semiconductor electronics, methods of fabrication, bipolar junction transistors, FET, MOS transistors, diodes, capacitors, and resistors. Design techniques for linear digital integrated electronic components and circuits. Discussion of computer-aided design, MSI, and LSI.

Spring, 3 credits, ABCF grading

ESE 519 Semiconductor Lasers and Photodetectors

The course provides an introduction to performance, testing and fabrication techniques for semiconductor lasers and photodetectors. The topics include fundamentals of laser and detector operation, devices band diagram, device characteristics, and testing techniques for analog and digital edge emitting and surface emitting lasers, avalanche and PIN photodetectors. Special attention is given to the design and working characteristics of transmitters and pumping lasers for telecommunication networks.

Prerequisite: B.S. in Physical Sciences or Electrical and Computer Engineering
3 credits, ABCF grading

ESE 520 Applied Electromagnetics

Wave phenomena and their importance in electromagnetic engineering. Harmonic waves. Phase and group velocities. Dispersive and nondispersive propagation. Transmission lines. Maxwell Equations. Uniform plane waves, waveguides, resonators. Scattering matrix theory. Introduction to antenna theory. Electrostatics and magnetostatics as special cases of Maxwell equations.

Spring, 3 credits, ABCF grading

ESE 521 Applied Optics

This course teaches students the fundamental techniques necessary for analyzing and designing optical systems. Topics include matrix methods for ray optics, fundamentals of wave optics, beam optics, Fourier optics and electromagnetic optics. The latter part of the course will deal with optical activity in anisotropic media and include polarization and crystal optics, electro-optics and acousto-optics.

3 credits, ABCF grading

ESE 522 Fiber Optic Systems

This course covers the essential components of a modern optical fiber communication system: (I) wave propagation in optical fiber waveguides, (II) transmitter design, (III) receiver design, (IV) single wavelength fiber-optic networks, and (V) wavelength division multiplexing networks.

Prerequisite: ESE 319

Fall, 3 credits, ABCF grading

ESE 524 Microwave Acoustics

Continuum acoustic field equations. Wave equation, boundary conditions, and Pointing vector. Waves in isotropic elastic media: plane-wave modes, reflection and refraction phenomena, bulk-acoustic-wave (BAW) waveguides, surface acoustic waves (SAW). Plane and guided waves in piezoelectric media. BAW transduction and applications: delay-line and resonator structures, the Mason equivalent circuit, monolithic crystal filters, IM CON dispersive delay lines, acoustic microscopes, SAW transduction and applications: the interdigital transducer, band-pass filters, dispersive filters, convolvers, tapped delay lines, resonators.

Prerequisite: ESE 319

Fall, 3 credits, ABCF grading

ESE 526 Silicon Technology for VLSI

This course introduces the basic technologies employed to fabricate advanced integrated circuits. These include epitaxy, diffusion, oxidation, chemical vapor deposition, ion implantation lithography and etching. The significance of the variation of these steps is discussed with respect to its effect on device performance. The electrical and geometric design rules are examined together with the integration of these fabrication techniques to reveal the relationship between circuit design and the fabrication process.

Fall, 3 credits, ABCF grading

ESE 527 Circuit Theory and Applications

Foundation of design procedures for electric circuits. Fundamental concepts, graph theory, network equations, network functions, state equations, network synthesis, scattering parameters, nonlinear circuits.

Fall, 3 credits, ABCF grading

ESE 528 Communication Systems

This course provides a general overview of communication theory and addresses fundamental concepts in this field. After a review of signals and systems representations, various continuous and digital modulation schemes are analyzed. Spread spectrum systems and their application to multiuser communications are also addressed. Advanced communication systems are described and general concepts of wide and local area networks are introduced.

Fall, 3 credits, ABCF grading

May be repeated for credit

ESE 529 Electrical Network Theory

Linear and nonlinear electrical networks; graph theory; determination of operating points; transient estimation; interconnection networks; numerical methods; parameter extraction; infinite and transfinite networks; discrete potential theory; random walks on networks.

Spring, 3 credits, ABCF grading

ESE 530 Computer-Aided Design

The course presents techniques for analyzing linear and nonlinear dynamic electronic circuits using the computer. Some of the topics covered include network graph theory, generalized nodal and hybrid analysis, companion modeling. Newton's method in n-dimensions and numerical integration.

Prerequisite: B.S. in Electrical Engineering
Spring, 3 credits, ABCF grading

ESE 531 Detection and Estimation Theory

Hypothesis testing and parameter estimation. Series representation of random processes. Detection and estimation of known signals in white and nonwhite Gaussian noise. Detection of signals with unknown parameters.

Prerequisite: ESE 503 or permission of instructor

Spring, 3 credits, ABCF grading

ESE 532 Theory of Digital Communication

Optimum receivers, efficient signaling, comparison classes of signaling schemes. Channel capacity theorem, bounds on optimum system performance, encoding for error reduction, and the fading channel. Source coding and some coding algorithms.

Prerequisite: ESE 503

Fall, 3 credits, ABCF grading

ESE 535 Information Theory and Reliable Communications

Measures of information: entropy, relative entropy, and mutual information. The asymptotic equipartition property. Lossless source coding: Kraft inequality and the source coding theorem. Introduction to error correcting codes. Continuous and waveform channels. Rate-distortion theory.

Prerequisite: ESE 503 or equivalent or permission of instructor

Spring, 3 credits, ABCF grading

ESE 536 Switching and Routing in Parallel and Distributed Systems

This course covers various switching and routing issues in parallel and distributed systems. Topics include message switching techniques, design of interconnection networks, permutation, multicast and all-to-all routing in various networking nonblocking, and rearrangeable capability analysis and performance modeling.

Prerequisite: ESE 503 and 545 or CSE 502 and 547, or permission of instructor

3 credits, ABCF grading

ESE 540 Reliability Theory

Theory of reliability engineering. Mathematical and statistical means of evaluating the reliability of systems of components. Analytical models for systems analysis, lifetime distributions, repairable systems, warranties, preventive maintenance, and inspection. Software reliability and fault tolerant computer systems.

Prerequisite: ESE 503 or permission of instructor

3 credits, ABCF grading

ESE 541 Digital System Design

The course provides an introduction to digital and computer systems. The course follows a top-down approach to presenting design of computer systems, from the architectural-level to the gate-level. VHDL language is used to illustrate the discussed issues. Topics include design hierarchy and top-down design, introduction to hardware description languages, computer-aided design and digital synthesis, basic building blocks like adders, comparators, multipliers, latches, flip-flops, registers etc, static and dynamic random access memory, data and control buses, fundamental techniques for combinational circuit

analysis and design, sequential circuit design procedures, and programmable logic devices. Testing of digital designs is addressed throughout the course. A mini project will complement the course. Cannot be used to fulfill any ESE degree requirements.

Prerequisites: B.S. in Engineering, but not EE, CE or CS.

Spring, 3 credits, ABCF grading

ESE 542 Product Design Concept Development and Optimization

This graduate course will concentrate on the design concept development of the product development cycle, from the creative phase of solution development to preliminary concept evaluation and selection. The course will then cover methods for mathematical modeling, computer simulation and optimization. The concept development component of the course will also cover intellectual property and patent issues. The course will not concentrate on the development of any particular class of products, but the focus will be mainly on mechanical and electromechanical devices and systems. As part of the course, each participant will select an appropriate project to practice the application of the material covered in the course and prepare a final report.

Prerequisites: Undergraduate electrical or mechanical engineering and/or science training

Fall, 3 credits, ABCF grading

ESE 545 Computer Architecture

The course covers uniprocessor and pipelined vector processors. Topics include: hierarchical organization of a computer system; processor design; control design; memory organization and virtual memory; I/O systems; balancing subsystem bandwidths; RISC processors; principles of designing pipelined processors; vector processing on pipelines; examples of pipelined processors. The course involves a system design project using VHDL.

Prerequisite: ESE 318 or equivalent

Spring, 4 credits, ABCF grading

ESE 546 Computer Communications Network

An introduction to the quantitative and qualitative aspects of telecommunication networks. Continuous time and discrete time single queue system analysis. Data link, network, and transport protocols layers. Network interconnection. Multiple access techniques. Flow and congestion control. High speed switching.

Prerequisite: ESE 503 or permission of instructor

Fall, 3 credits, ABCF grading

ESE 547 Digital Signal Processing

A basic graduate course in Digital Signal Processing. Sampling and reconstruction of Signals. Review of Z-Transform theory. Signal flow-graphs. Design of FIR and IIR filters. Discrete and fast Fourier transforms. Introduction to adaptive signal processing. Implementation considerations.

Prerequisite: Senior level course in signals and systems

Fall, 3 credits, ABCF grading

ESE 548 Local and Wide Area Networks

Extended coverage of specific network protocols. Protocols covered include IEEE 802 local area network protocols. Asynchronous Transfer Mode (ATM), Synchronous optical Network (SONET), metropolitan area network protocols, backbone packet switching protocols, and transport control protocol/Internet protocol (TCP/IP), network security, Web server design and grid computing.

Prerequisite: ESE 546 or permission of instructor

Summer, 3 credits, ABCF grading

ESE 549 Advanced VLSI System Testing

This course is designed to acquaint students with fault diagnosis of logic circuits. Both combinatorial and sequential circuits are considered. Concepts of faults and fault models are presented. Emphasis is given to test generation, test selection, fault detection, fault location, fault location within a module and fault correction.

Prerequisite: B.S. in Electrical Engineering Spring, 3 credits, ABCF grading

ESE 550 Network Management and Planning

This course provides an introduction to telecommunications and computer network management and planning. Network management is concerned with the operation of networks while network planning is concerned with the proper evolution of network installations over time. Network management topics include meeting service requirements, management operations, management interoperability, and specific architectures such as Telecommunications Management Network (TMN), and Simple Network Management Protocol (SNMP). Network planning topics include planning problem modeling, topological planning design, heuristic and formal solution techniques.

Fall, 3 credits, ABCF grading

ESE 551 Switching Theory and Sequential Machines

Survey of classical analysis and synthesis of combination and sequential switching circuits, followed by related topics of current interest such as error diagnosis and fail soft circuits, use of large-scale integration, logic arrays, automated local design.

Prerequisite: ESE 318 or equivalent

Fall, 3 credits, ABCF grading

ESE 552 Interconnection Networks

Formation and analysis of interconnect processing elements in parallel computing organization. Topics include: SIMD/MIMD computers, multiprocessors, multicomputers, density, symmetry, representations, and routing algorithms. Topologies being discussed include: Benes, Omega, Banyan, mesh, hypercube, cube-connected cycles, generalized chordal rings, chordal rings, DeBruijn, Moebius graphs, Cayley graphs, and Borel Cayley graphs.

Prerequisite: ESE 545 or equivalent

Fall, 3 credits, ABCF grading

ESE 553 A/D and D/A Integrated Data Converters

This is an advanced course on analog integrated circuit design aspects for data converters.

Topics include: continuous and discrete-time signals and systems; sampling theorem; ideal ND and D/A converters; specifications and testing of data converters; basic building blocks in data converters: current sources and mirrors, differential gain stages, voltage references, S/H circuits, comparators; Nyquist D/A and ND converters: principles of data conversion and circuit design techniques; oversampling data converters: low-pass and band-pass delta-sigma modulators, decimation and interpolation for delta-sigma data converters. The attending students must be acquainted with principles of transistor operation, function of simple analysis. Familiarity with SPICE is required.

3 credits, ABCF grading

ESE 554 Computational Models for Computer Engineers

This course covers mathematical techniques and models used in the solution of computer engineering problems. The course heavily emphasizes computer engineering application. Topics covered include set theory, relations, functions, graph theory and graph algorithms, and algebraic structures.

Fall, 3 credits, ABCF grading

ESE 555 Advanced VLSI Systems Design

Techniques of VLSI circuit design in the MOS technology are presented. Topics include MOS transistor theory, CMOS processing technology, MOS digital circuit analysis and design, and various CMOS circuit design techniques. Digital systems are designed and simulated throughout the course using an assortment of VLSI design tools.

Prerequisite: B.S. in Electrical Engineering or Computer Science

Spring, 3 credits, ABCF grading

ESE 556 VLSI Physical and Logic Design Automation

Areas to be covered are Physical Design Automation and Logic Design Automation. Upon completion of this course, students will be able to develop state-of-the-art CAD tools and algorithms for VLSI logic and physical design. Tools will address design tasks such as floor planning, module placement and signal routing. Also, automated optimization of combinational and sequential circuits will be contemplated.

Prerequisite: B.S. in Computer Engineering/Science or Electrical Engineering

Fall, 3 credits, ABCF grading

ESE 557 Digital Signal Processing II: Advanced Topics

A number of different topics in digital signal processing will be covered, depending on class and current research interest. Areas to be covered include the following: parametric signal modeling, spectral estimation, multirate processing, advanced FFT and convolution algorithms, adaptive signal processing, multi-dimensional signal processing, advanced filter design, dedicated signal processing chips, and signal processing for inverse problems. Students will be expected to read and present current research literature.

Prerequisite: ESE 547 or permission of instructor

Spring, 3 credits, ABCF grading

ESE 558 Digital Image Processing I

Covers digital image fundamentals, mathematical preliminaries of two-dimensional systems, image transforms, human perception, color basics, sampling and quantization, compression techniques, image enhancement, image restoration, image reconstruction from projections, and binary image processing.

Prerequisite: B.S. in Engineering or Physical or Mathematical Sciences

Fall, 3 credits, ABCF grading

ESE 559 Digital Image Processing II

The course material will proceed directly from DIP-I, starting with image reconstruction from projections. After the basic projection, theorems are developed and computerized axial tomography techniques will be examined in detail including forward and inverse random transformations, convolution, back projection, and Fourier reconstruction; nuclear magnetic resonance imaging and positron emission tomography will be similarly covered. Surer resolution concepts will be developed and applied to a variety of remote sensing applications as well as digital image coding for efficient transmission of digital TV imagery.

Prerequisite: ESE 558

Spring, 3 credits, ABCF grading

ESE 560 Optical Information Processing

The course is designed to give the student a firm background in the fundamentals of optical information processing techniques. It is assumed that the student is familiar with Fourier transforms and complex algebra, and is conversant with the principles of linear system theory. The course begins with a mathematical introduction to linear system theory and Fourier transformation. The body of the course is concerned with the scalar treatment of diffraction and its application to the study of optical imaging techniques and coherent and incoherent optical processors.

Prerequisite: B.S. in Physical Sciences

Spring, 3 credits, ABCF grading

ESE 563 Fundamentals of Robotics I

This course covers homogenous transformations of coordinates; kinematic and dynamic equations of robots with their associated solutions; control and programming of robots.

Prerequisite: Permission of instructor

Fall, 3 credits, ABCF grading

ESE 565 Parallel Processing Architectures

This course provides a comprehensive introduction to parallel processing. Topics include types of parallelism, classification of parallel computers, functional organizations, interconnection networks, memory organizations, control methods, parallel programming, parallel algorithms, performance enhancement techniques and design examples for SIMD array processors, loosely coupled multiprocessors, and tightly coupled multiprocessors. A brief overview of dataflow and reduction machines will also be given.

Prerequisite: ESE 545 or equivalent

Spring, 3 credits, ABCF grading

ESE 566 Hardware-Software Co-Design of Embedded Systems

This course will present state-of-the-art concepts and techniques for design of embedded systems consisting of hardware and software components. Discussed topics include system specification, architectures for embedded systems, performance modeling and evaluation, system synthesis and validation. The course is complemented by three mini-projects focused on designing and implementing various co-design methods.

Prerequisites: ESE 333, ESE 345 or equivalent

Fall, 3 credits, ABCF grading

ESE 568 Computer and Robot Vision

Principles and applications of computer and robot vision are covered. Primary emphasis is on techniques and algorithms for 3D machine vision. The topics include image sensing of 3D scenes, a review of 2D techniques, image segmentation, stereo vision, optical flow, time-varying image analysis, shape from shading, texture, depth from defocus, matching, object recognition, shape representation, interpretation of line drawings, and representation and analysis of 3D range data. The course includes programming projects on industrial applications of robot vision.

Prerequisite: B.S. in Engineering or Physical or Mathematical Sciences
3 credits, ABCF grading

ESE 570 Bioelectronics

Origin of bioelectric events; ion transport in cells; membrane potentials; neural action potentials and muscular activity; cortical and cardiac potentials. Detection and measurement of bioelectric signals; impedance measurements used to detect endocrine activity, perspiration, and blood flow; impedance cardiography; vector cardiography; characteristics of transducers and tissue interface; special requirements for the amplification of transducer signals.

Fall, 3 credits, ABCF grading

ESE 575 Advanced VLSI Signal Processing Architecture

This course is concerned with advanced aspects of VLSI architecture in digital signal processing and wireless communications. The first phase of the course covers the derivation of both data transformation and control sequencing from a behavioral description of an algorithm. The next phase reviews the general purpose and dedicated processor for signal processing algorithms. This course focuses on low-complexity high-performance algorithm development and evaluation, system architecture modeling, power-performance tradeoff analysis. The emphasis is on the development of application-specific VLSI architectures for current and future generation of wireless digital communication systems. An experimental/ research project is required.

Prerequisite: ESE 355 or equivalent, ESE 305 or ESE 337 or equivalent, ESE 306 or ESE 340 or equivalent, ESE 380 or equivalent
3 credits, ABCF grading

ESE 580 Microprocessor-Based Systems Engineering I

This course is a study of methodologies and techniques for the engineering design of microprocessor-based systems. Emphasis is placed on the design of reliable industrial quality systems. Diagnostic features are included in these designs. Steps in the design cycle are considered. Specifically, requirement definitions, systematic design implementation, testing, debugging, documentation, and maintenance are covered. Laboratory demonstrations of design techniques are included in this course. The students also obtain laboratory experience in the use of microprocessors, the development of systems, circuit emulation, and the use of signature and logic analyzers.

Fall, 4 credits, ABCF grading

ESE 581 Microprocessor-Based Systems Engineering II

This course is a study of methodologies and techniques for the engineering design of microprocessor-based systems. Emphasis is placed on the design of reliable industrial quality systems. Diagnostic features are included in these designs. Steps in the design cycle are considered. Specifically, requirement definitions, systematic design implementation, testing, debugging, documentation, and maintenance are covered. Laboratory demonstrations of design techniques are included in this course. The students also obtain laboratory experience in the use of microprocessors, the development of systems, circuit emulation, and the use of signature and logic analyzers.

Spring, 4 credits, ABCF grading

ESE 588 Pattern Recognition

Basic concepts of pattern recognition techniques are introduced, including statistical pattern recognition, syntactic pattern recognition, and graph matching. Topics on Bayes decision theory, parametric and nonparametric techniques, clustering techniques, formal languages, parsing algorithms, and graph-matching algorithms are covered.

Prerequisite: Stochastic processes and data structures

Spring, 3 credits, ABCF grading

ESE 591 Industrial Project in OEMS Engineering

A student carries out a detailed design of an industrial project in OEMS engineering. A comprehensive technical report of the project and an oral presentation are required.

Prerequisite: Permission of Graduate Program Director and instructor

Fall, 3 credits, ABCF grading

ESE 597 Practicum in Engineering Internship

This course is for part-time and full-time graduate students, relating to their current professional activity. Participation is in private corporations, public agencies, or non-profit institutions. Students will be required to have a faculty advisor as well as a contact in the outside organization to participate with them in regular consultations on their project. Students are required to submit a final written report to both. The maximum credit that can be accepted toward the M.S. degree is 3.

Fall, spring, and summer, 1-3 credits, S/U grading

May be repeated for credit

ESE 599 Research Master's Students

Fall and spring, 1-12 credits, S/U grading
May be repeated for credit

ESE 610 Seminar in Solid-State Electronics

Current research in solid-state devices and circuits and computer-aided network design.

Fall and spring, 3 credits, ABCF grading

ESE 670 Topics in Electrical Sciences

Varying topics selected from current research topics. This course is designed to give the necessary flexibility to students and faculty to introduce new material into the curriculum before it has attracted sufficient interest to be made part of the regular course material. Topics include biomedical engineering, circuit theory, controls, electronics circuits, digital systems and electronics, switching theory and sequential machines, digital signal processing, digital communications, computer architecture, networks, systems theory, solid-state electronics, integrated electronics, quantum electronics and lasers, communication theory, wave propagation, integrated optics, optical communications and information processing, instrumentation, and VLSI computer design and processing.

Fall and spring, 3 credits, ABCF grading
May be repeated for credit

ESE 691 Seminar in Electrical Engineering

This course is designed to expose students to the broadest possible range of the current activities in electrical engineering. Speakers from both on and off campus discuss topics of current interest in electrical engineering.

Fall and spring, 1 credit, S/U grading
May be repeated for credit

ESE 697 Ph.D. Practicum in Teaching

The course provides hands-on experience in classroom teaching. Other activities may include preparation and supervision of laboratory experiments, exams, homework assignments and projects. Final report that summarizes the activities and provides a description of the gained experience and a list of recommendations is required.

Prerequisite: G5 status and permission of Graduate Program Director

Fall and spring, 3 credits, ABCF grading

ESE 698 Practicum in Teaching

Fall and spring, 1-3 credits, S/U grading
May be repeated for credit

ESE 699 Dissertation Research on Campus

Prerequisite: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab
Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

ESE 700 Dissertation Research off Campus-Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will

take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, and summer, 1-9 credits,
S/U grading

May be repeated for credit

ESE 701 Dissertation Research off Campus-International

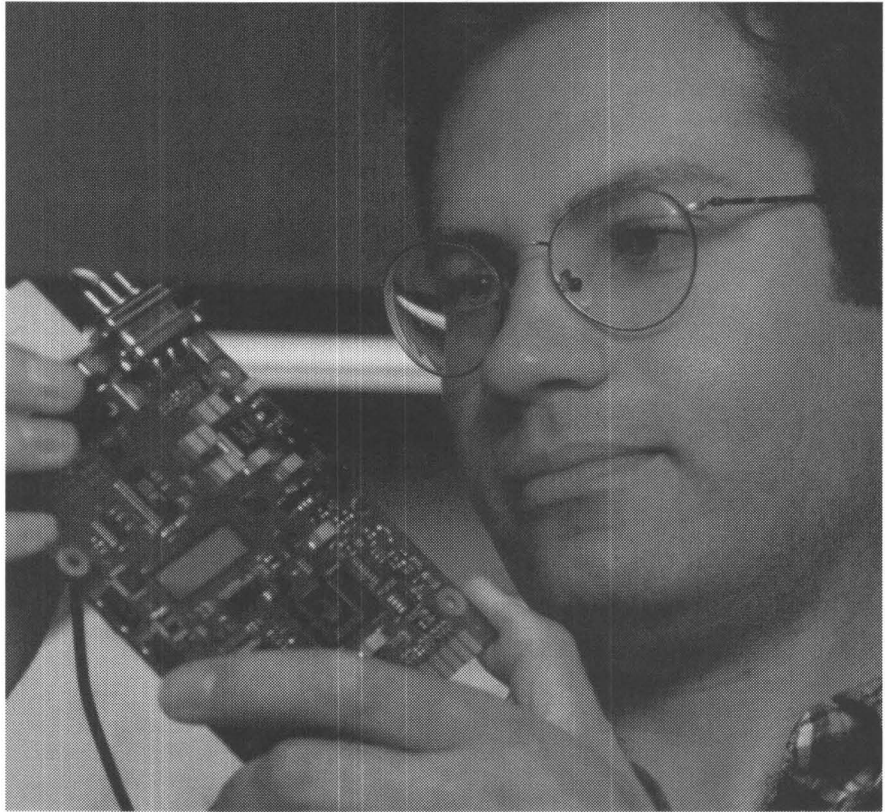
Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits,
S/U grading

May be repeated for credit

ESE 800 Full Time Summer Research

0 credits, S/U grading



English (EGL)

Chairperson: Stephen Spector, Humanities Building 2020 (631) 632-9833

Graduate Program Director: Joaquin Martinez-Pizarro, Humanities Building 2089 (631) 632-7784

Graduate Secretary: Janet Meckley, Humanities Building 2087 (631) 632-7373

Degrees awarded: M.A. in English; Ph.D. in English

Stony Brook's Department of English, in the College of Arts and Sciences, is known for scholarship and teaching. Over the past few years, faculty members have published more than 40 books of criticism, fiction, and poetry. Among the many awards individuals have won are the Pulitzer Prize, the National Book Critics' Circle Award, Guggenheim fellowships, Fulbright research and teaching fellowships, and National Endowment for the Humanities fellowships and grants. Five faculty members have received both the Chancellor's and the President's Award for Excellence in Teaching, two have been appointed SUNY Distinguished Teaching Professors, and one has been named SUNY Distinguished Professor. Supplementing the resources of the English department's staff are campus institutes with which the department is affiliated. The Humanities Institute provides a place for interdisciplinary and theoretical work, offers an annual graduate student seminar, and sponsors an ongoing lecture series and annual conferences of international speakers.

Students enrolled in the Master of Arts program pursue a course of study that includes courses in historical periods, literary genres, topics in gender, race, and cultural studies, and various writing workshops. The program offers students the opportunity to broaden as well as deepen their knowledge of literature while also developing their own writing skills. This course of study leads to the Master of Arts degree and requires 30 credits, including a master's thesis, for completion.

Students enrolled in the Ph.D. program pursue a course of study that is designed, in large part, around individual interests and that moves from a broad-based survey to a more narrowly focused specialization. Eleven courses are required of each student. EGL 600, The Discipline of Literary Studies, must be taken during the first fall semester of study, as it introduces students to the variety of approaches to literature represented in current criticism. Students select their remaining

courses in consultation with faculty advisors; these courses are intended to strengthen the student's literary background and theoretical knowledge, and further define chosen areas of inquiry. To accommodate the latter goal, students may take courses in other departments with approval from the graduate director. While pursuing the Ph.D. in English, students may also earn an interdisciplinary graduate certificate in women's studies, cultural studies, or composition studies.

Corresponding to the pattern of study that underlies the Ph.D. program are the oral examination and the special field conversation that all students take. The first, a three-hour general examination taken at the end of the fifth semester, enables each student to concentrate on three literary periods or two literary periods and one issue, genre, or theory relevant to the student's interests. The two-hour special field conversation, conducted in the sixth semester, focuses on the student's intended area of research and fosters the bibliographical and methodological skills needed to compose the dissertation proposal.

Ph.D. students receiving financial support teach one course each semester. Teaching assignments are varied and flexible. Teaching assistants teach courses in composition or introductory courses in literature and assist professors in large lecture courses. During their first semester of teaching writing at Stony Brook, students must enroll in the Teaching Practicum, which provides them with pedagogical theory and teaching supervision. All Ph.D. students on financial support must be registered as full-time students.

Admission

Applicants for admission to all graduate programs in English should submit all materials by January 15 for fall semester admission. In all cases, admission is determined by the graduate admissions committee of the department under guidelines established by the Graduate School. Applicants are admitted on the basis of their total records, and there are no predetermined quantitative criteria

that by themselves ensure a positive or negative decision. There is mid-year admission to the M.A. program but not the Ph.D. program. The deadline for spring M.A. admission is October 1.

About the Graduate Record Examination

All applicants to the Stony Brook University are required to take the general aptitude portion of the Graduate Record Examination (GRE). The English Department does not require applicants to take the subject test.

Our admissions committee will review an applicant's file when all documents have been received. This includes the GRE score. Therefore, it is to the student's advantage to take the exam at the earliest opportunity. We do not admit provisionally. Information about testing dates can be obtained by contacting the Educational Testing Service at www.gre.org. While we have no set cut-off score for admission, we pay special attention to the score on the verbal and analytical writing sections of the examination.

Admission to the M.A.T. in English 7-12

The M.A.T. in English 7-12 is administered by the School of Professional Development. Individuals interested in this program should refer to the School of Professional Development's section in this bulletin.

Admission to the M.A. Program in English

The following, in addition to the minimum Graduate School requirements, are required for admission to the M.A. program:

- A. A bachelor's degree from a recognized institution;
- B. An average of at least B in the last two years of undergraduate work;
- C. An official transcript of all undergraduate work;
- D. Letters of recommendation from three instructors;

E. The applicant's score on the Graduate Record Examination (GRE) General Test, required of all students by the Graduate School;

F. A sample of recent scholarly or critical writing;

G. Acceptance by both the Department of English and the Graduate School.

Admission to the Ph.D. Program in English

The following, in addition to the minimum Graduate School requirements, are required for admission to the Ph.D. program:

A. A bachelor's degree from a recognized institution;

B. An average of at least B in the last two years of undergraduate work;

C. An official transcript of all undergraduate work and of any graduate work that may have been done;

D. Letters of recommendation from three instructors;

E. The applicant's score on the Graduate Record Examination (GRE) General Test, required by the Graduate School of applicants in all departments;

F. A sample of recent scholarly or critical writing;

G. Proficiency in a foreign language equivalent to two years of college work;

H. Acceptance by both the Department of English and the Graduate School.

Faculty

Distinguished Professor

Kaplan, E. Ann⁵, Director of the Humanities Institute. Ph.D., 1970, Rutgers University: Literary and film theory; feminist studies; modern American literature; 19th-century American literature; postcolonial British literature; film.

Levy, Jonathan², Ph.D., 1966, Columbia University: Playwriting; theatre for children; dramatic criticism; Italian Renaissance drama.

Professors

Belanoff, Patricia, Ph.D., 1982, New York University: The teaching of composition and literature; rhetoric; Old English.

Huffman, Clifford C.¹, Ph.D., 1969, Columbia University: The Renaissance; Shakespeare.

Kenny, Shirley Strum, President of the University. Ph.D., 1964, University of Chicago: Restoration and 18th-century British drama.

Martinez-Pizarro, Joaquin⁵, Ph.D., 1976, Harvard University: Literary history of the Middle Ages; classical and medieval backgrounds; comparative studies.

Manning, Peter, J., Chairperson. Ph.D., 1968, Yale University: 19th-century British literature.

Munich, Adrienne, Ph.D., 1976, City University of New York: Victorian literature, art, and culture; feminist theory and women's studies.

Olster, Stacey^{3,4}, Ph.D., 1981, University of Michigan: American studies; 20th-century literature; Asian literature; literature in relation to history and politics; popular culture; Pynchon.

Rosen, Carol, Ph.D., 1975, Columbia University: Dramatic theory and criticism; dramaturgy; comparative modern drama; Renaissance drama and Shakespeare.

Spector, Stephen, Ph.D., 1973, Yale University: Old and Middle English literature; history of the English language; the Bible; intolerance in medieval literature; Christianity and Judaism; drama through Shakespeare; manuscript study and bibliography; the "other" in medieval literature and society.

Associate Professors

Bashford, Bruce, Ph.D., 1970, Northwestern University: Literary theory and the history of criticism; rhetoric and the teaching of composition; the logic of interpretation and critical argument; humanism.

Cooper, Helen, Ph.D., 1982, Rutgers University: 19th-century British literature; 20th-century Black British literature and film; Caribbean, African, and Indian literatures; feminist theory; colonial discourse theory; cultural studies.

Dunn, Patricia A., D.A., 1991, University at Albany: Composition and rhetoric; English education; disability studies.

Haralson, Eric, Ph.D., 1993, Columbia University: 19th- and 20th-century British and American literatures; men's studies; Henry James.

Hutner, Heidi, Ph.D., 1993, University of Washington: Restoration and 18th-century studies; colonial and postcolonial discourse; women writers; women's studies; eco-feminism.

Lindblom, Kenneth, Director of the English Teacher Education Program. Ph.D., 1996, Syracuse University: English education; theory, history and practice of composition-rhetoric; discourse pragmatics.

Scheckel, Susan, Graduate Program Director. Ph.D., 1992, University of California, Berkeley: 19th-century American literature and culture.

Assistant Professors

Marshik, Celia, Ph.D., 1999, Northwestern University: British and transatlantic modernism, women's studies.

Newman, Andrew, Ph.D., 2004, University of California, Irvine: Early American literatures; literacy theory; comparative literatures of contact.

Phillips, Rowan Ricardo, Ph.D., 2002, Brown University: Poetry; African-American literature; Caribbean literature; the writing of poetry.

Robinson, Benedict, Ph.D., 2001, Columbia University: Early modern literature and culture; representations of Islam; religion and literature; Shakespeare; Milton.

Wakankar, Milind, Ph.D., 2002, Columbia University: Post-colonial literature and theory; vernacular literatures.

Lecturer

Videbaek, Bente, Undergraduate Program Director. Ph.D., 1992, Northwestern University: Renaissance drama and theater; Scandinavian literature.

Affiliated Graduate Faculty

(Faculty members from other departments who may serve as "inside" members of English Ph.D. exam committees.)

Mary Jo Bona (European Languages): Italian American studies, ethnic American women writers, theories of race and ethnicity.

Roman de la Campa (Hispanic Languages and Literature): Latin American and Caribbean literature; contemporary critical theory.

Krin Gabbard (Comparative Studies): Film; psychoanalysis; jazz.

Fred Gardaphe (European Languages): Italian American studies; theories of race and ethnicity.

Lorenzo Simpson (Philosophy): Critical race theory; Frankfurt school; cosmopolitanism.

Tracey Walters (African Studies): African-American, African diasporic writers.

Number of teaching, graduate, and research assistants, fall 2005: 39

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1993. Recipient of the President's Award for Excellence in Teaching, 1993

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1991

3) Recipient of the President's Award for Excellence in Teaching, 1987

4) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1988

5) Joint appointment, Comparative Literature

6) Recipient of the President's Award for Excellence in Teaching as Part-time Faculty, 2003 and the Students' Choice Award for Most Influential Professor, 2004

Degree Requirements

Requirements for the M.A. Degree

In addition to the minimum requirements of the Graduate School, the following are required:

A. Course Requirements

A master's degree in English requires ten three-credit graduate courses completed with a 3.0 overall grade point average, competence in one foreign language, and submission of a master's thesis. Of the ten courses, one must be in the history and structure of the

English language and one must be in rhetoric or composition theory (including problems in the teaching of composition); courses previously taken on the undergraduate level and passed with a grade of B or better may be accepted as fulfilling these requirements. Students will sign up for three credits of thesis research while writing a master's thesis. The other seven courses must include one course on literature before 1700 and one course after 1700, and courses in at least two of the following topic areas:

583: Topics in Theory

584: Topics in Genre Studies

585: Topics in Cultural Studies

586: Topics in Gender Studies

587: Topics in Race, Ethnic, or
Diaspora Studies

588: Writing Workshop

Note: Topic courses may be repeated as long as content varies. Courses run through the School of Professional Development are not accepted for English M.A. requirements.

B. Independent Studies

Only one course numbered EGL 599, Independent Studies, will be permitted to count toward the total courses required for the degree of Master of Arts in English. EGL 599 cannot be elected during the student's first semester of work toward the master's degree. EGL 599 may be elected during the second semester only if the student has a B+ average in the first semester and has no Incompletes at the time of registering for EGL 599. A proposal for a 599 course should be submitted in writing to the faculty member under whose direction the student plans to study. This proposal must be submitted before the end of the semester previous to that in which the student will register for EGL 599. The proposal must be approved in writing by both the directing faculty member and the graduate program committee of the English Department before the student registers for EGL 599.

C. Foreign Language Requirement

Competence in one foreign language may be satisfied by having completed the second year of a foreign language at the undergraduate level within the past five years with a grade of B or better,

or by examination arranged by the English department. The following languages are automatically accepted for fulfilling this requirement: Greek, Latin, Hebrew, French, German, Italian, Russian, Spanish, Hindu, and Bengali. Other languages relevant to a student's graduate program may be approved upon petition to the graduate program committee.

D. Master's Thesis

Students enroll for EGL 598 while writing a master's thesis of 30 to 40 pages under the guidance of a thesis advisor (chosen by the student with approval of the graduate director) and an additional faculty member chosen by the student and the advisor. A final copy of the thesis and written approvals from the advisor and reader must be submitted by the last day of classes in the semester in which the student graduates. Students must be registered in the semester in which they graduate.

Transfer Credit and Standards of Performance in English at the M.A. Level

The department permits the transfer of six hours of credit in suitable graduate work done elsewhere that resulted in a grade of B or better. The student must, however, make special application after admission. In all coursework done at Stony Brook, an average grade of B is the minimum required, but no more than two grades below B- will be permitted. The time limit for completion of the M.A. degree is three years for full-time students and five years for part-time students. Any student who plans not to enroll in classes for a semester must apply for an official leave of absence; failure to do so will lead to a lapse in enrollment. To re-apply, the student must pay a \$500 readmission fee.

Requirements for the Ph.D. Degree

In addition to the minimum requirements of the Graduate School, the following are required:

A. Course Requirements

The minimum course requirement for students in the doctoral program is 11 courses, including at least seven 600-level seminars. No course with a grade below B- may be used to satisfy course requirements. In order to continue in the program, students must maintain

an average grade of B or better in all coursework, and no more than two grades below B- will be permitted. No transfer credit is accepted at the seminar level.

One of the seven seminars the student must satisfactorily complete is the proseminar, EGL 600, The Discipline of Literary Studies. Students must take this course in their first fall semester in the program.

While the majority of courses for the Ph.D. requirements must be taken in the English department, students may, in consultation with their advisors, take courses of an equivalent level in other departments or programs. Requests must be approved in writing by the Director of Graduate Studies.

It is assumed that students entering the Ph.D. program will have studied Chaucer, Shakespeare, Milton, and a variety of literary periods in their B.A. or M.A. programs. However, students with a variety of backgrounds are welcome into the Ph.D. program; those without the kind of broad-based knowledge outlined above will work out a suitable program of study with their advisors.

Students with teaching assistantships must pass the Teaching Practicum in their first semester of teaching in the Writing program.

B. Foreign Language Requirements

Students must complete one of two options:

Option I: Students must, on examination, demonstrate ability to translate writings of moderate difficulty in two foreign languages appropriate to the area of study, and hence ability to make use of relevant literary and scholarly writings in those languages. Students can satisfy this requirement by obtaining a grade of B or higher in a 500-level reading/translation course (e.g., FRN 500, GER 500). Other language courses offered to fulfill this requirement will need the approval of the graduate program director.

Option II: Students must, on examination, demonstrate (1) ability to read, understand, and speak well one living foreign language, or ability to read and understand well one classical language appropriate to the area of study, and (2) knowledge of the major literature of that language in the original language, and hence ability to make full use of

the literature of another language. This option can be satisfied by passing a half-hour oral examination conducted in the language on the major literary figures or works of the language. Students should consult the graduate program director about setting up such an examination. Passing the reading and/or comprehensive examination at the M.A. level shall not be sufficient evidence that the student has met Option II.

The following languages are automatically accepted for fulfilling the language requirement: Greek, Latin, Hebrew, French, German, Italian, Russian, and Spanish. Other languages relevant to a student's graduate program may be approved upon petition to the graduate program director.

Students will not be permitted to take the Special Field Conversation without first satisfying the foreign language requirement. Students choosing Option I must satisfy one language requirement before taking the General Examination and the second before taking the Special Field Conversation.

C. General Examination

The general examination is a three-part, three-hour oral with three examiners. Two parts of the examination must focus on different literary periods of approximately 100 years each, and the third will either address another literary period or engage a problem or area of special interest (e.g., a genre, issues, or a line of theoretical inquiry).

In consultation with their examiners, students will offer reading lists for this examination that outline the area of inquiry for each part of their exam. Because one of the purposes of the exam is to give students the opportunity to make sense of their lists, the period lists may or may not vary from the traditional literary historical divisions of the anthologies. Whereas one student may follow traditional texts for a literary period, another may choose to study noncanonical texts within a traditional chronological range, while another may redefine the range (e.g., 1750-1850 or 1850-1945 instead of the 18th century, 19th century, or 20th century).

Taking this examination brings students a step closer to entering a profession in which one writes and publishes scholarship and constructs and teaches courses. To promote this kind of professional development, to facilitate students' focus, and to

enhance the conversations that make up the examinations:

1. For the first part, the student will submit to his or her committee, at least two weeks prior to the exam, a 15 to 30 page paper related to a particular period or problem area. In most cases, this will be a revised seminar paper, and will include a bibliography. The paper is not intended as additional work, but rather as a way for the student to organize an approach to one of the lists. During the exam, the paper will serve as a springboard for discussion of the entire period or area being examined.

2. For the second part, the student will submit to his or her committee, at least two weeks prior to the exam, a syllabus and bibliography of background reading for an advanced undergraduate course in a particular period or problem area. Questions regarding pedagogical and theoretical approach, as well as inquiries into criteria of selection and content, will help to initiate and focus discussion of the entire period or area being examined.

3. For the third part, the student may simply invite questions without using one of the above devices, or may submit another paper or syllabus (or some other piece of writing agreeable to the committee) as a means of generating and directing discussion of the entire list.

The examination committee will consist of a chairperson selected by the student and two other faculty members appointed by the graduate program director in consultation with the chairperson. The committee must be formed no later than the student's fourth semester in the program (preferably earlier), and the exam must be taken before the end of the fifth semester. In consultation with his or her chairperson, the student may choose to take this exam in two parts. All three committee members must sign all three of the reading lists at least one month prior to the examination. The student must submit to the graduate director the signed reading lists along with a memo, stating the names of the members on the committee, one month before the exam.

Each of the three parts will be judged separately as either pass or fail. Each failed part may be retaken one additional time, no later than a year after the original examination.

It is the responsibility of the examination committee chairperson to inform the Graduate Office in writing of the date, time, and place of the examination two weeks before the examination.

D. Special Field Conversation

This conversation will be based on a written rationale and a reading list prepared by the student with the advice and approval of the student's chosen committee, and approved by the graduate program director at least one month before the conversation. The focus of the conversation will be the topic that the student has chosen for his or her dissertation; thus, the reading list will embrace the various kinds of text that the student must engage in order to begin writing. All three members of the committee will be chosen by the student. Two members must be from the English Department.

Students must contact the graduate director six weeks prior to the date they wish to schedule the conversation to fill out the necessary papers. The conversation will be scheduled by the Graduate Office. Within one week following the special field conversation, the student, in consultation with the director, will write a summary of the important issues in the conversation and submit it to the graduate program committee.

All the doctoral requirements described above must be completed before a student is allowed to schedule the special field conversation.

E. Advancement to Candidacy

After successful completion of the Special Field Conversation, the student is recommended to the dean of the Graduate School for advancement to candidacy.

F. Dissertation

No later than the beginning of the seventh semester, students will prepare a written statement setting out the scope and method of the dissertation and submit it to their dissertation director, two other members of the department who will serve as readers, and a reader from outside the department. After the student's director has conferred with the other readers and the dissertation committee has approved the proposal, the student will submit the proposal and the signed dissertation contract to the

graduate director for approval. Students should contact the Graduate Office of the department for details on how to submit the proposal.

The four readers of the dissertation must recommend acceptance of the dissertation before it can be approved by the Graduate School. Students will present the results of dissertation research at a colloquium convened for that purpose by the Department of English, which will be open to interested faculty and graduate students.

G. The Dissertation Defense

At least eight weeks before the Graduate School's deadline for submitting the completed dissertation, the student will submit to his or her readers what is intended to be the final draft of the dissertation. No more than four weeks after that, if the readers have agreed that the dissertation is ready to be defended, the director will schedule the defense. (This is distinct from the actual acceptance of the dissertation, which can take place only at the defense itself.)

H. Teaching Program

Training in teaching is stressed by the department, and every student should expect to teach as part of the doctoral program. Teaching assistants instruct in a variety of courses including composition and introductions to poetry, fiction, and drama; tutor in the Writing Center; and assist in large lecture courses. An important part of the teaching experience is the Practicum in Teaching, required of all teaching assistants.

I. Residency Requirement

The Graduate School requires at least two consecutive semesters of full-time graduate study beyond the baccalaureate. Students will be considered in full-time residence during any semester in which they (1) are taking at least one 500-level course or 600-level seminar or are, in the opinion of the graduate program committee, properly preparing for the special field oral examination; (2) are holding no position other than that required under the teaching program; or (3) are registered for EGL 699 Dissertation Research or EGL 690, Directed Reading for Doctoral Candidates, for three, six, nine, or 12 credit hours, depending on the number of other courses being

taken, and the teaching assignment. The total of all these credits and teaching hours is to be no more than 12 for G3, nine for G4, and six for G5 students.

J. Advising and Review of Student's Progress

Each incoming student will meet with an assigned advisor before the start of classes to plan his or her first semester's coursework. The student will also meet with his or her advisor in November and May before preregistration for each semester's courses. At the end of the first year, each student will select his or her own advisor and inform the Graduate Office in writing of the advisor's name. Students will meet at least once each semester with advisors to plan their coursework.

Each spring semester, the graduate program committee will review each student's progress and determine whether the student may proceed with doctoral studies, may continue if certain requirements are met, or may not continue in the doctoral program because of unsatisfactory work. In order to retain financial support, teaching assistants must maintain a 3.5 GPA, in addition to satisfying the program requirements described above.

Matters Pertaining to All Advanced Degrees in English

A. Extension of time limits: Extensions of time limits are granted at the discretion of the graduate program director of the department and the dean of the Graduate School and are normally for one year at a time.

B. Incompletes: The graduate program committee has established as sufficient grounds for the granting of Incompletes either a student's medical emergency or an emergency arising within a student's family. All other requests require a special petition to the instructor.

C. Graduate courses in the 500 series are open to all graduate students. Courses in the 600 series are normally open only to students admitted to study for the Ph.D. degree, although M.A. students with adequate preparation and background can sometimes be admitted with the permission of the instructor. All graduate courses normally carry three credits.

Each course in the 500 and 600 series to be offered in a given semester will

be described by the instructor in some detail in a special departmental announcement prepared and distributed toward the end of the semester prior to that in which it is to be offered. None of the courses numbered 690-699 can be taken to satisfy the requirement of seven seminars as stated in the sections outlining course requirements for the English Department. Courses run through the School of Professional Development are not accepted for the requirements of the degree.

Advising

There are a number of problems that the preceding explanations make no attempt to cover; students are encouraged to raise individual questions about the graduate program with the graduate program director in English.

Courses

EGL 501 Studies in Chaucer

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 502 Studies in Shakespeare

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 503 Studies in Milton

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 505 Studies in Genre

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs
May be repeated for credit

EGL 506 Studies in Literary Theory

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 509 Studies in Language and Linguistics

Prerequisite: Enrollment in the English M.A., Ph.D., M.A.T., or Composition Studies Certificate programs

EGL 510 Old English Language and Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 515 Middle English Language and Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 520 Studies in the Renaissance

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 525 17th-Century Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 530 Studies in Restoration Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 535 Studies in Neoclassicism

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 540 Studies in Romanticism

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 545 Studies in Victorian Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 547 Late 19th-Century British Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 550 20th-Century British Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 555 Studies in Irish Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 560 Studies in Early American Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 565 19th-Century American Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 570 20th-Century American Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 575 British and American Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 582 Drama Workshop

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 583 Topics in Theory

Changing issues in theoretical approaches to literature, culture, or writing.

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 584 Topics in Genre Studies

Changing issues in the historical study of particular genres, such as the novel, lyric poetry, film, drama, etc.

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 585 Topics in Cultural Studies

Changing issues in the interdisciplinary study of culture, including literature, popular culture, discourse studies, media studies, etc. Focus is on the analysis of historical contexts and on methods derived from contemporary cultural theory.

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 586 Topics in Gender Studies

Changing historical or theoretical focus on issues in gender studies, sexuality, queer studies, or women's writing.

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 587 Topics in Race, Ethnic, or Diaspora Studies

Changing historical or theoretical focus on issues of race or ethnicity, on U.S., British, or global ethnic literatures, or on experiences, histories, or theories of colonization, decolonization, empire, globalism, or diaspora.

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 588 Writing Workshop

Changing focus on various forms of writing, including poetry, drama, fiction, the essay, etc.

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs and permission of instructor

EGL 592 Problems in Teaching Writing or Composition

This course provides an overview of writing pedagogy as applied to tutoring in a Writing Center or in an English classroom. Included in the course is fieldwork in the campus Writing Center.

Prerequisite: Enrollment in the English M.A., Ph.D., M.A.T., or Composition Studies Certificate programs
Fall, 3 credits, ABCF grading

EGL 593 Problems in Teaching Literature

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 594 Contexts of Literary Study

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 597 Practicum in Methods of Research

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs

EGL 598 Thesis Research

Research and writing of M.A. thesis supervised by faculty advisor.

Prerequisite: Completion of 15 credits and permission of instructor

Fall, spring, and summer, 1-3 credits, S/U grading

May be repeated for credit

EGL 599 Independent Study

Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs and permission of instructor

May be repeated for credit

EGL 600 Proseminar: The Discipline of Literary Studies

Pro-seminar: Introduction to critical analysis, including theoretical and methodological approaches, and an orientation to the profession both in the academy and other careers. Faculty members will speak on their own scholarship and professional experiences.

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
3 credits, ABCF grading

EGL 601 Problems in History and Structure of the English Language

A survey of the English language from its historical beginnings through the present.

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
3 credits, ABCF grading

EGL 602 Problems in Bibliography, Editing, and Textual Criticism

An introduction to the study of manuscripts and printed books, with special emphasis on editorial and textual problems and decisions.

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
3 credits, ABCF grading

EGL 603 Problems in Literary Theory and Criticism

A seminar on any of the current theoretical approaches to texts.

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
3 credits, ABCF grading
May be repeated for credit

EGL 604 Problems in Literary Analysis

An introduction to the explication of texts.

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
3 credits, ABCF grading
May be repeated for credit

EGL 605 Problems in Convention and Genre

An examination of literary types and categories.

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
3 credits, ABCF grading
May be repeated for credit

EGL 606 Period and Tradition

An examination of the major issues that pertain to particular historical literary periods.

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
3 credits, ABCF grading
May be repeated for credit

EGL 607 Individual Authors

In-depth study of specified writers, from Old English to Contemporary World Literatures in English.

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
3 credits, ABCF grading
May be repeated for credit

EGL 608 Problems in the Relationship of Literature to Other Disciplines

This seminar will encourage the interdisciplinary focus of our program by examining the intersection between textual studies and other forms of inquiry.

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
3 credits, ABCF grading
May be repeated for credit

EGL 611 Critical Theory

A seminar on influential theoretical approaches to texts.

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
3 credits, ABCF grading
May be repeated for credit

EGL 612 Theories in Composition

This course explores the relationship between reading and writing skills, the differences between speech production and writing production, and the relationship between literacy, culture, and language politics.

Prerequisite: Enrollment in the English Ph.D. program or the Composition Studies Certificate program
Spring, alternate years, 3 credits, ABCF grading

EGL 613 Research in Composition

This course provides an introduction to the nature of empirical research in Composition Studies. Students will survey landmark research studies, learn how to read research reports critically, and conduct a mini-research project in their own classrooms or tutoring situations to analyze underlying causes of students' writing problems.

Prerequisite: Enrollment in the English Ph.D. program or the Composition Studies Certificate program
Spring, alternate years, 3 credits, ABCF grading

EGL 614 Topics in Composition and Writing

This course can be a directed reading in particular areas of interest for classroom teachers, or a pilot study to prepare for the Ph.D. dissertation in Composition Studies. The shape of the course will be geared to the needs of those enrolled.

Prerequisite: Enrollment in the English Ph.D. program or the Composition Studies Certificate program
3 credits, ABCF grading
May be repeated for credit

EGL 690 Directed Readings

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor
May be repeated for credit

EGL 695 Methods of Teaching English

Prerequisite: Enrollment in the English Ph.D. program or permission of instructor

EGL 697 Practicum in Teaching English Literature

Teaching workshop for introductory courses in poetry, fiction, and drama.

Prerequisite: EGL teaching assistants only
3 credits, S/U grading

EGL 698 Practicum in Teaching Writing

Students take the seminar in conjunction with teaching a section of WRT 101. This course provides hands-on experience and instruction in the basics of writing pedagogy, including designing writing assignments, sequencing assignments, motivating writing, writing skill development and evaluating writing. Students will also be given a preliminary

overview of the major theories driving composition pedagogy.

Prerequisite: Matriculation in a graduate program
Fall, 3 credits, S/U grading

EGL 699 Dissertation Research on Campus

Prerequisites: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab; enrollment in the English Ph.D. program or permission of instructor
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

EGL 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor
Fall, spring, and summer
1-9 credits, S/U grading
May be repeated for credit

EGL 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

EGL 800 Summer Research

0 credits, S/U grading
May be repeated

European Languages, Literatures, and Cultures (GER, RLF, RLI, SLV, DLG, DLF, DLI, DLL, DLR)

Chairperson: Nicholas Rzhevsky, Humanities Building 1055 (631) 632-7440

Graduate Program Director: Mary Jo Bona, Humanities Building 1144 (631) 632-7440

Graduate Secretary: Joan Vogelle, Humanities Building 1055 (631) 632-7440, 632-7442

Degrees awarded: M.A. in Germanic Languages and Literature; M.A. in Romance Languages and Literature; M.A. in Slavic Languages and Literature; D.A. in Foreign Languages (French, German, Italian, Russian) [M.A. program in German and D.A. program are temporarily suspended.]

The department, within the College of Arts and Sciences, offers a wide variety of programs emphasizing study of the European languages, literatures, and cultures, courses in pedagogical methodology, supervised teaching experience, and advanced training for careers related to international affairs. The department is committed to providing the best possible graduate education: two of its members have been named Distinguished Professor and eight have received the Chancellor's Award for Excellence in Teaching. The proximity of numerous cultural institutions such as the Center for Italian Studies on campus, the Goethe House in New York, the Kosciuszko Foundation, the New York Public Library, and the Harriman Institute of Columbia University, enhance graduate study in the department.

The programs have been designed with today's career opportunities in mind. Students are encouraged to shape a personal curriculum, drawing on other departments engaged in issues pertinent to pedagogy and European cultural history, such as Comparative Studies, History, Linguistics, Philosophy, Political Science, and Theatre Arts. The department supports exchange programs with France, Germany, Russia, Poland, and Italy.

More detailed information is available from the department office and on the Internet at www.sumysb.edu/eurolangs. Part-time study is permitted; most graduate courses are offered during the late afternoon or evening. Our advisors work closely with students in designing a program to meet individual needs.

Degree Programs

M.A. Curriculum

The M.A. curriculum for each language program is designed to introduce students to research in European languages, literatures, and cultures leading to the D.A. or Ph.D. degrees, and to prepare

students for teaching on the college, university, or secondary school level, as well as for careers involving international expertise. Students specialize in one of the offered languages, literary histories, and cultures, or create a combined program (i.e., two Romance languages) with the help of their advisors. Most courses are conducted in the target language. Experienced teaching assistants are encouraged to design and teach advanced courses on the undergraduate level. A carefully developed advising system enables students to tailor specially structured programs to suit their individual needs and interests.

M.A. Program in Romance Languages

The Department offers an M.A. in Romance Languages with possible interdepartmental concentrations in French and Spanish, Italian and Spanish, and French and Italian. The curriculum is formulated according to the individual student's needs. It is a flexible program that suits students who wish to go on to doctoral work as well as those who wish to terminate their studies with the master's degree. There are two possible tracks:

Track A, Literature and Culture: Designed for students who wish to follow a traditional M.A. program or intend to proceed toward further study on the D.A. or Ph.D. level. Typically students design a curriculum that includes literature, linguistics, and culture courses in one of the Romance languages or in a combination of two Romance languages. This track gives the students a choice of writing a Master's Thesis or passing a Comprehensive Examination to qualify for the degree.

Track B, Language Pedagogy for Secondary School Teachers: For students who have completed provisional requirements to teach languages in secondary schools and are required by state regulations to complete a master's degree. The track is specifically designed for

those students who have completed the Teacher Preparation Program in Foreign Languages at the undergraduate level. It allows secondary school teachers to further concentrate in the target language and culture they teach or in a combination of two Romance languages. A cornerstone of the program is faculty mentorship. Upon completing 12 hours of graduate work, each student designs a course of study. Upon completing all coursework, the student develops an independent research topic under mentor supervision. All courses are offered no earlier than 5:30 p.m. to meet the time constraints of secondary school teachers.

Graduate courses in other fields and the School of Professional Development (SPD) program are open to qualified students. Departmental students are encouraged to take courses in related areas. With the permission of their advisor, students may obtain six credits outside the program.

M.A. Programs in Germanic and Slavic

See course requirements below. [Program temporarily suspended.]

M.A.T. Program in French 7-12, German 7-12, Italian 7-12, Russian 7-12

Consult the SPD section in this bulletin.

D.A. Program in Foreign Languages (Program Temporarily Suspended)

The program leading to the Doctor of Arts degree provides pedagogical training in European languages, literatures, and cultures. It is appropriate for those interested in teaching on the secondary school, junior college, college or university level, as well as for potential specialists in language laboratories, media studies, communications, marketing, and others interested in acquiring an in-depth knowledge of the European languages, literatures, and cultures. The course of study is flexible, competency based, and where possible, tailored to individual needs.

The program consists of coursework, research in the major field, practice in areas of professional preparation, demonstration of successful teaching, a comprehensive examination, and a doctoral dissertation or project. Students may elect to specialize in French, German, Italian, or Slavic. Admission is granted to full- and part-time students who have the B.A. or its equivalent.

A more detailed description of the graduate program is available from the departmental office. This information includes specific distribution requirements, fields of specialization, and material pertaining to the preliminary and qualifying examinations. Interested students should request information and application forms as early as possible, especially if they plan to apply for financial aid.

Facilities

The Language Learning and Research Center offers a variety of tutorial tools in the languages taught at the University and includes two computer laboratories, two audio and video laboratories, and two multimedia classrooms. The Center regularly hosts workshops and courses (see listings of courses under the Doctor of Arts program) relating to the intersections between technology and language, literature, and culture learning.

Students are encouraged to take advantage of the on-campus Humanities Institute. The Institute brings leading national and international specialists in the humanities to speak on current issues and provides Stony Brook students with the latest research in culture studies, literature, and the arts.

The holdings of the Frank Melville Jr. Memorial Library include extensive collections in print and other media pertinent to each of the four major language groups taught by the department. The department maintains a high profile in state-of-the-art technologies, including Internet applications of language, literature, and culture pedagogy.

Admission

Admission to the M.A. Programs

For admission to graduate studies in the M.A. programs, the following, in addition to the minimum requirements of the Graduate School, are normally required:

A. A bachelor's degree or its equivalent from a reputable scholarly institution; for the Interdepartmental M.A. curriculum in Romance Languages, a Bachelor's degree or its equivalent with a major in either French, Italian, or Spanish and at least 18 credits in a second language (French, Italian, or Spanish);

B. Three letters of recommendation written by persons qualified to assess the candidate's preparation;

C. For foreign students, a TOEFL;

D. A transcript of undergraduate records;

E. Acceptance by both the department and the Graduate School;

F. Normally a grade average of at least B in the undergraduate major.

Provisional admission may be offered in some exceptional cases.

While it is expected that the applicant demonstrate superior preparation in a European language, an undergraduate major in that language is not required. Students judged to be deficient in language proficiency are required to take remedial courses during the academic year or in the summer.

Foreign students must furnish as much information as possible about their training abroad (official certification degrees, lists of courses taken, and papers submitted, whenever possible), together with letters of recommendation. Each application will be judged individually. Transfer credit for previously taken graduate courses will be assessed by the faculty and approved within the regulations of the Graduate School.

Admission to the D.A. Program in Foreign Languages

In addition to the requirements of the Graduate School, the department requires:

A. A B.A. degree or its equivalent in coursework and credits;

B. Three letters of recommendation from persons qualified to assess the candidate;

C. Results of the Graduate Record Examination (GRE) General Test, and, for foreign students, the TOEFL;

D. Demonstrated proficiency in a European language;

E. Acceptance by both the department and the Graduate School.

Provisional admission may be given to some students not meeting all of the above requirements.

Faculty

Professors

Fontanella, Luigi, Ph.D., Harvard University: Modern Italian literature.

Gardaphé, Fred, Ph.D., Coordinator of Italian American Program. Ph.D., University of Illinois, Chicago: Italian American studies, English literature.

Mignone, Mario B., Coordinator of Italian Program, Director of Center for Italian Studies. Ph.D., Rutgers University: Contemporary Italian literature.

Rzhevsky, Nicholas, Chairperson. Ph.D., Princeton University: Russian and Soviet literature; Russian theatre; ideology.

Associate Professors

Bloomer, Robert K., Director of Undergraduate Studies, Coordinator of the German Program. Ph.D., University of Michigan: Germanic linguistics; morphology; etymology.

Bona, Mary Jo, Director of Graduate Studies. Ph.D., University of Wisconsin, Madison: Italian American studies; English literature.

Fedi, Andrea, Laurea in Lettere e Filosofia, Università di Firenze, Ph.D., University of Toronto: Italian Renaissance literature; historiography.

Franco, Charles, Academic Advisor of Italian Programs, Coordinator of Medieval Studies Program. Ph.D., Rutgers University: Dante; Medieval Italian literature.

Kalinowska-Blackwood, Izabela, Ph.D., Yale University: Russian and Polish literature, culture, and film.

Kerth, Thomas A.³, Ph.D., Yale University: Medieval literature; Middle High German; philology; German poetry.

Reich, Jacqueline, Ph.D., University of California, Berkeley: Modern Italian literature; Italian film studies.

Westphalen, Timothy, Coordinator of the Slavic Languages Program. Ph.D., Harvard University: Russian poetry; Russian symbolism; 19th-century Russian literature; Bakhtin.

Assistant Professors

Jourdain, Sarah, Coordinator of the Teacher Training Program. Ph.D., Indiana University: Pedagogy and teacher training; French language.

Ledgerwood, Mickle, Director of Language Learning Center, Coordinator of French Program. Ph.D., University of North Carolina, Chapel Hill: Education and technology; semiotics; French civilization; Quebec.

Raynard, Sophie, Doctoratès Lettres, Université de Paris IV Sorbonne; Ph.D., Columbia University: French and romance philology.

Sanou, Prosper, Ph.D., University of Minnesota: French language and pedagogy.

Full-Time Lecturers

Balducci, Gioacchino, Dottore in Lingue e Civiltà Orientali, Oriental Institute at the University of Naples: Italian cinema and theatre.

Godfrey, Aaron W., Coordinator of Classics Studies Program. M.A., Hunter College: Latin; Medieval studies.

Marchegiani, Irene, Doctorate, University of Florence, Italy: Pedagogy; Italian language and literature.

Viola, Birgit Grosse-Middledorf, D.A., Stony Brook University: German language and culture; business German.

Watts, Monique, M.A., Stony Brook University: French language.

Part-Time Lecturers

Dolezal, Stana, D.A., Stony Brook University: Eastern European literature and culture; Czech language.

Geisherik, Anna, D.A., Stony Brook University: Foreign language teaching methodology; heritage-learner pedagogy.

Grenkov, Tatyana, Ph.D., Stony Brook University: Comparative studies.

Guida, George, Italian American studies.

Russo-Rumore, Nancy, Professional Diploma, Long Island University, CW Post Campus; M.S. Education, St. John's University: Foreign language teaching methodology.

Taub, Ron, M.A., Hofstra University: Certificate in Administration and Supervision; pedagogy and supervising student teaching.

Schaffer, Ronalee, M.A., Teachers College, Columbia University: French language and culture.

Varuolo, Franco, M.A., Stony Brook University: Italian language and culture.

Affiliated Faculty

Bailyn, John F., Department of Linguistics, Assistant Professor. Ph.D., Cornell University: Slavic linguistics; Russian language and linguistics; syntax.

Bethin, Christina Y.², Department of Linguistics, Professor. Ph.D., University of Illinois, Urbana-Champaign: Slavic linguistics; Russian, Polish, and Ukrainian languages; phonology.

Harvey, Robert⁴, Department of Comparative Studies, Professor; Coordinator of French Languages Program. Ph.D., University of California, Berkeley: Contemporary French and Maghrebian Francophone literature; critical theory; film.

Hurley, E. Anthony, Department of Africana Studies, Associate Professor. Ph.D., Rutgers University: Francophone literature of the Caribbean and Africa; 19th-century French literature.

Petrey, Donald, Department of Comparative Studies, Professor. Ph.D., Yale University: 19th-century French literature; comparative literature; literary theory.

Roncero López, Victoriano, Department of Hispanic Languages, Associate Professor. Ph.D., Universidad Complutense and University of Illinois: Golden Age literature; Quevedo studies, picaresque novel; 16th-century Spanish poetry.

Repetti, Lori, Department of Linguistics, Associate Professor. Ph.D., University of California, Los Angeles: Romance linguistics; Italian dialectology; history of the Italian language.

Silverman, Hugh J., Department of Philosophy, Professor. Ph.D., 1973, Stanford University: Continental philosophy and criticism; contemporary cultural/literary/film theory; history of aesthetic and literary theory; interdisciplinary studies in European philosophy, literatures, and cultures.

Volat, Héléne, Librarian/Lecturer. M.A., Stony Brook University; M.L.S., Long Island University: Humanities biographer; reference librarian; bibliography; research methods.

Emeriti Faculty

Allentuch, Harriet, Ph.D., Columbia University: 17th-century French literature.

Blum, Carol, Ph.D., Columbia University: 18th-century French literature; literature of the French Revolution.

Brown, Frederick, Ph.D., Yale University: 19th- and 20th-century French literature.

Brown, Russell E., Ph.D., Harvard University: Modern German literature; expressionist poetry; Trakl; Brecht; Jahn.

Czerwinski, Edward J., Ph.D., University of Wisconsin: Russian literature; comparative literature; Dostoevsky; Slavic and East European theatre and drama.

Elling, Barbara¹, Distinguished Teaching Professor, Ph.D., New York University: Romanticism; German cultural studies.

Rizzuto, Anthony, Ph.D. Columbia University: 19th- and 20th-century French literature.

Russell, John R., Ph.D., 1966, Princeton University: Rokoko; the novella; computer-assisted instruction.

Tursi, Joseph, Ph.D., CUNY: Italian language and foreign language pedagogy.

Weinreb, Ruth Plaut, Ph.D., Columbia University: 18th-century French literature.

Zimmermann, Eléonore M., Ph.D., Yale University: 17th- and 20th-century French literature; comparative studies.

Number of teaching, graduate, and research assistants, fall 2004: 10

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1973

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1983

3) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1992

4) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1996

5) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1977

Degree Requirements

Requirements for the M.A. Degree in Romance Languages

Track A: Literature and Culture

The M.A. requires a specialization in French, in Italian, or in a combination of two Romance Languages (French, Italian, and Spanish). It requires at least ten three-credit courses (eight courses for students who opt to write a Thesis) to be completed with a grade average of B or better, for a total of 30 credits.

A. Course Requirements

French

1. FRN 501 Contemporary Culture and Civilization (3 credits)

2. FRN 507 Advanced French Composition (3 credits)

3. Eight additional courses (six for students who opt for an M.A. Thesis) chosen in consultation with the advisor to formulate an area of specialization; these courses may include three courses in related disciplines (18-24 credits)

4. Master Thesis (optional) (6 credits)

Total: 30 credits

Italian

1. ITL 501 Contemporary Italian Culture and Civilization (3 credits)

2. ITL 508 Advanced Italian Composition (3 credits)

3. One of the following courses: ITL 507, 511, 512, 513 (3 credits)
Seven additional courses (five for students who opt for an M.A. Thesis) chosen in consultation with an advisor to formulate an area of specialization; these courses may include three courses in related disciplines (15-21 credits)

5. Master Thesis (optional) (6 credits)

Total: 30 credits

Romance Languages

1. Composition and Syntax in the two chosen languages (FRN 507, ITL 508, SPN 515) (6 credits)

2. One of the following Romance Linguistics courses: ITL 513, FRN 513, SPN 503, SPN 504 (3 credits)

3. Seven additional courses in two Romance languages (five for students who opt for an M.A. Thesis) to formulate a major and a minor; these courses are

to be chosen in consultation with the advisors and approved by the respective programs to formulate an area of specialization; these courses may include three courses in related disciplines (15-21 credits)

4. Master Thesis (optional) (6 credits)

Total: 30 credits

B. Language Requirement

Competence at the intermediate level in a language other than the language of specialization, preferably in a second modern Romance language or Latin is required. Students opting for a combination of two Romance languages will automatically satisfy this requirement. This requirement may be fulfilled through a departmental examination or a suitable language course designed for graduate students.

C. M.A. Examination or Thesis (Choice of Option 1 or 2)

1. M.A. Thesis: Students write a Master Thesis under the supervision of a faculty advisor, along with a second faculty member in his or her major program and a third faculty member in a related field. Upon completion of the thesis, the student prepares a formal presentation of the thesis.

2. M. A. Examination: Students who opt not to write a Master's Thesis must complete a four-hour written examination and a one-hour oral examination. The examination is based on a comprehensive reading list in the student's area of specialization. Three faculty members will serve as examiners.

Track B: Language Pedagogy for Secondary School Teachers

The M.A. in Romance Languages for Secondary School Teachers consists of a total of 30 credits. Students will take three core courses (9 credits) and 7 courses (21 credits) in their target language(s). Students must maintain a B average and receive at least a B in their language courses (FRN 507, ITL 508, SPN 515).

A. Course Requirements

Core Courses (9 credits)

1. FLA 540 Language Acquisition for Secondary School Teachers: The course will address specific needs related to teaching a foreign language in a secondary school by emphasizing practical application in language pedagogy (3 credits)

2. DLL 571 Teaching Through Technology (3 credits)

3. FLA 581 Independent Research Project (3 credits)

4. Competence in a foreign language other than the target language

Note: Courses of study for areas of specialization are available for French, Italian, and Romance languages (21 credits):

French

1. FRN 501 Modern French Culture (3 credits)

2. FRN 502 History of French Civilization (3 credits)

3. FRN 507 Syntax and Composition (3 credits)

4. FRN 510 Phonetics (3 credits)

5. One course in literature in French (3 credits)

6. Two elective courses relevant to the program chosen in consultation with the advisor (6 credits)

Total : 21 credits

Italian

1. ITL 501 Modern Italian Culture (3 credits)

2. ITL 502 Italian Cinema (3 credits)

3. ITL 508 Syntax and Composition (3 credits)

4. ITL 511 History of Italian Language or ITL 507 Italian Linguistics (3 credits)

5. One course in literature in Italian (3 credits)

6. Two elective courses relevant to the program chosen in consultation with the advisor (6 credits)

Total: 21 credits

Romance Languages

Students may choose two of the three Romance languages taught at Stony Brook, with one as major and one as minor. Configuration of courses will be developed on an individual basis according to the student's needs. The following courses are required:

1. ITL 513, or FRN 513, or SPN 503, or SPN 504 Romance Linguistics (3 credits)

2. Two of the following: FRN 507, ITL 508, SPN 515 Syntax and Composition (6 credits)

3. Two of the following: FRN 501, ITL 501, SPN 510 Culture (6 credits)

4. Two elective courses relevant to the program chosen in consultation with the advisor (6 credits)

Total: 21 credits

Note: Culture and linguistics courses can be substituted with permission of the department subject to availability.

B. Language Requirement

Competence in a language other than the language of specialization, preferably in a second modern Romance language or Latin is required. Competence will be determined by departmental examination or by completing specific graduate courses approved by the department. Students opting for a combination of two Romance languages will automatically satisfy this requirement. For non-native English language speakers, fluency in English is required.

C. Research Project

Students must complete a Research Project under the supervision of a faculty advisor and subject to approval by a second faculty member in his or her major program and by a third faculty member in a related field. Upon completion, the student prepares a formal presentation of his or her research.

Requirements for the M.A. Degree in German (Temporarily Suspended)

Track A

A. Course Requirements

1. One 19th-century German literature course (3 credits), one 20th-century German literature course (3 credits), GER 545 or 546 (3 credits), GER 557 History of the German Language or GER 539 Contrastive Structures (3 credits), GER 599 Thesis (6 credits)

2. Four additional offerings at the graduate level from courses within the department or, upon prior approval by the department, from those of other departments within the Graduate School (12 credits)

Total: 30 credits

B. Performance

An average of B or higher is required on all graduate courses taken at Stony Brook.

C. M.A. Thesis

Submission of a scholarly essay on a topic and of a standard acceptable to the department is required.

*Track B***A. Course Requirements**

There is no thesis required. All 30 credits can be fulfilled by coursework as follows:

1. GER 504 German Cultural History (3 credits), GER 539 Contrastive Structures or GER 557 History of the German Language (3 credits), one course in older Germanic languages such as GER 558, 562, or 563 (3 credits), one course in 20th-century German literature such as GER 545 or 546 (3 credits)
2. Six additional offerings at the graduate level from courses within the department or, upon prior approval by the department, from those of other departments within the Graduate School (18 credits)

Total: 30 credits

B. Performance

An average of B or better is required for all graduate courses taken at Stony Brook.

Requirements for the M.A. Degree in Slavic (Temporarily Suspended)**A. Course Requirements**

1. Three courses in advanced language and/or linguistic study (9 credits)
2. One course in culture (3 credits)
3. Two courses in Russian literature (6 credits)
4. Four electives in the student's major area with approval of the department (12 credits)

Total: 30 credits

B. Language Proficiency in Russian

The Russian language proficiency requirement may be satisfied by one of the following:

1. Passing an examination;
2. Appropriate coursework in Russian (RUS 311, 312, or equivalent);
3. One semester of study abroad in the Commonwealth of Independent States (C.I.S.) in an approved program such as the SUNY-Albany/MGU Exchange.

C. Second Slavic Language Requirement

This requirement may be satisfied by one of the following:

1. A proficiency examination;
2. Appropriate coursework in the language (i.e., SLV 580, 581);
3. Study abroad in an approved program in Eastern Europe or the C.I.S.

With the approval of the program, a non-Slavic language of Eastern Europe or the C.I.S. may be substituted for the second Slavic language.

D. Thesis or Comprehensive Examination

A master's thesis or comprehensive examination based on a reading list and coursework is required.

Requirements for the D.A. Degree in Foreign Languages (Temporarily Suspended)

A minimum of 36 credits is required, to be distributed as follows: 9 credits in pedagogical and methodological issues related to foreign languages, literatures, and cultures; 9 credits in the language of specialization; 9 credits in culture and literature; and 9 credits to be completed through an Internship or Externship, and a dissertation or project. The dissertation or project may be completed in conjunction with a qualified academic semester or summer study abroad program, teaching practice, or independent research determined in consultation with the principal advisor.

A. Language Proficiency

Upon completion of 24 credits, all candidates will be expected to demonstrate proficiency in the language of specialization. Proficiency may be demonstrated:

1. By written recommendation of a faculty member from the department
2. By formal written examination when the major advisor and D.A. committee deem it necessary

Students who do not pass the examination may request a second testing during the following semester.

B. Practical Experience

All candidates are required to fulfill the following teaching and research assignments during the program:

1. Practicum: The student is given charge of a three-hour section in a beginning or intermediate course. The practicum

takes place after the student has successfully completed training in language, literature, or culture instruction that covers objectives, grading, and testing.

2. Internship or Externship: For the Internship, the student is apprenticed to a professor in charge of a literature, language, or culture course for at least one semester. For the Externship, the student teaches independently but under faculty supervision in a qualified secondary school, college, or university. The Internship or Externship may not precede the practicum.

3. Dissertation or Project: The student explores a research area developed in consultation with his or her advisor.

C. Final Evaluation

The final evaluation is based on the program of study that the candidate has completed. The student is expected to demonstrate mastery of the individual curriculum requirements and a thorough understanding of the components of the program. Final examinations are scheduled twice yearly, in November and April.

1. The final evaluation includes both a written and an oral comprehensive examination covering topics from all areas in the program. The examination is scheduled after the candidate has demonstrated competence in the area of specialization, and in pedagogical and methodological issues. It is the responsibility of the candidate to prepare, with his or her advisor, a reading list that includes the student's area of specialization.

2. Dissertation or Project: Upon successful completion of the comprehensive examination, the candidate, in consultation with his or her advisor, submits a proposal. After the proposal is approved, a committee is appointed in consultation with the program director. This committee includes a supervisor and at least two advisors. At least two faculty members must be from the department and, subject to availability, one may be from outside the department.

Transfer Credit

The D.A. committee may accept six post-M.A. transfer credits earned within the past five years from non-SUNY institutions. Nine credits may be accepted from all SUNY institutions. Under special circumstances and with

approval of the department, additional cross-listed credits may be counted toward the D.A. requirements.

Courses

French Courses

FRN 500 Techniques of Reading for Graduate Research

Through intensive study of language structures and idiomatic usage, with extensive practice in written translation of literary and scholarly texts, candidates for advanced degrees are able to attain the proficiency level of the graduate French reading requirement. Several departments grant exemption from further examination for successful completion of this course. (Not for graduate students in French.)

Spring, 3 credits, ABCF grading

FRN 501 Contemporary Culture and Civilization

Analysis of contemporary French civilization through the study of the development of its historical, cultural, political, and social characteristics. Designed for potential teachers of French at the college level as well as in secondary schools, this course will emphasize and trace the evolution of the character and institutions of contemporary France and French-speaking countries.

Spring, 3 credits, ABCF grading

FRN 502 French Civilization in Its Historical Perspective

In this course, students study historical French civilization concentrating on those features which have created France today and its current culture. Political and social developments are considered as well as major trends in the arts.

Spring, alternative years, 3 credits, ABCF grading

FRN 507 Stylistics (Syntax and Composition)

Stylistic theory and analysis. Problems of syntax and structure. Translations from English to French and French to English of texts from different modes and levels of discourse. Designed to develop and refine written expression in French and analysis of literary texts.

Spring, 3 credits, ABCF grading

FRN 508 Explication de Texte or Introduction to Literary Criticism

This course is designed to develop sensitivity to literary texts. Emphasis will be placed upon weekly explication de texte, beginning with Renaissance literature and proceeding to the modern period, in which analysis will be made of those effects that, taken together, constitute a given author's stylistic pattern.

Spring, 3 credits, ABCF grading

FRN 509 Bibliography and Research Methods

Students learn about the effective use of the library and its resources (reference sources and materials, on-line catalog, use of CD-ROMs and database searching). They are introduced to specialized bibliographies and other tools

essential to their research. A bibliography on a topic related to a special field of interest is required at the end of the course.

Spring, 1 credit, ABCF grading

FRN 510 French Phonetics and Diction

The pronunciation of French with emphasis on intonation and articulation. Theory and practice of linguistic and phonetic factors of the sound system. Coursework includes phonetic transcriptions, recordings, and diagnostic texts. Language laboratory required.

Spring, 3 credits, ABCF grading

FRN 511 Business French

A course designed to provide efficiency in spoken and written business French with an emphasis on bilingual translation. This course will also familiarize students with French business domestically, in the context of the European Union, and in contrast to America. Issues of current importance as well as institutions will be studied. Students will also carry on individual projects such as comparing marketing strategies of an American company in the U.S. and in France or profiling a major French company.

3 credits, ABCF grading

FRN 513 Romance Linguistics

This course examines the linguistic evolution of the Romance languages from the classical period through modern times. The synchronic grammars of Italian, French, and Spanish are examined.

Spring, 3 credits, ABCF grading

FRN 531 Studies in the Classical Theatre

Analysis of classical dramaturgy and some of the major themes of 17th-century tragedy and comedy. Close reading of selected plays by Corneille, Racine, and Moliere.

Spring, 3 credits, ABCF grading

FRN 532 Penseurs, Moralistes, et Mondains

Intensive reading and analysis of selected texts by authors such as Descartes, Pascal, La Fontaine, La Rochefoucauld, La Bruyere, Mme de Sevigne, and Mme de Lafayette. Changing topic.

*Fall or spring, 3 credits, ABCF grading
May be repeated for credit as topic changes*

FRN 541 Studies in 18th-Century French Literature

A study of the major texts in the 18th-century struggle between absolutism and the emerging forces of Enlightenment, as well as readings in preromanticism. In addition to the works of Montesquieu, Voltaire, Diderot, Rousseau, Beaumarchais, and Laclos, other types of writing, such as Bayle's dictionary and the Encyclopedie, are examined.

*Fall or spring, 3 credits, ABCF grading
May be repeated for credit as the topic changes*

FRN 542 Seminar in 18th-Century French Literature

Special topics in 18th-century literature, such as "Representing the French Revolution," "Dialogics in Diderot and Rousseau," "The Concept of the Individual," and "Femme, Cloture, Ecriture," are studied through the works of major writers of the period as well as those of lesser-known figures such as Mme.

de Graffigny, Mme. Riccoboni, Mme. d'Epinay, Olympe de Gouges, and other revolutionaries such as Mirabeau, Saint-Just, Condorcet, and Robespierre.

Spring, 3 credits, ABCF grading

FRN 552 Studies in 19th-Century French Literature

Close reading of selected works by major novelists of the period, such as Balzac, Stendhal, Flaubert, Zola; themes such as Paris versus the provinces, money and decadence; or 19th-century poetry by Baudelaire, Mallarme, Verlaine, and Rimbaud, with an introduction to some important critical approaches to these texts.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

FRN 561 Seminar in 20th-Century French Literature

Broad samplings of texts from throughout the century are critically investigated while the period's literary history is reviewed. Sample authors: Proust, Gide, Sartre, Camus, Sarraute, Duras, Giraudoux, Claudel, Beckett, Butor, Queneau, Valery, Ponge, Char, Cesaire, Bonnefoy.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

FRN 562 Studies in Contemporary Literature

Focused examinations of French literary texts since 1968 and recent francophone writings. How has the novel survived the ceaseless testing of its limits? What is the status of contemporary poetry? Sample authors: Le Clezio, Ben Jelloun, Mallet-Joris, Alexis, Duras, Deguy, Roche, Bonnefoy, Tournier.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

FRN 564 Seminar in Francophone Literature

Close examination of the literatures written in French of the Francophone world outside of France, with special emphasis on the literatures written in French of the Caribbean and Africa. This course will pose and explore questions such as: What is Francophone literature? What is the function of writing in French in a Francophone context? Attention is paid to the issue of critical approaches to these texts. Topics vary from year to year and may include texts from any of the French-speaking territories outside of France. Sample authors: Mariama Ba, Chauvet, Cesaire, Conde, Glissant, Roumain, Schwartz-Bart, Senghor, Werewere-Liking.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

FRN 570 Special Topics in French Literature

Courses given in the past have covered a single author, French women writers, French poetry of 1664-1674 and other topics.

3 credits, ABCF grading

FRN 571 Free Seminars

Courses given in the past have covered a single author, genre, and other topics.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

FRN 581 Independent Individual Studies

Prerequisite: Must be enrolled in a graduate program

Fall, spring, and summer, 1-6 credits, ABCF grading

May be repeated for credit as topic changes

FRN 595 Practicum in Teaching

Fall and spring, 1-3 credits, S/U grading

May be repeated for credit

FRN 599 Thesis Research

Fall and spring, 1-3 credits, S/U grading

May be repeated for credit

FRN 800 Summer Research

May be repeated for credit

German Courses**GER 500 Intensive Reading German**

Intensive introductory German for graduate students in other programs. Practice in reading and translation; German prose; use of dictionaries and reference materials; as much attention as possible to special problems of various disciplines.

Fall and spring, 3 credits, ABCF grading

GER 506 Advanced Stylistics

Advanced stylistics and discourse analysis. Designed to deepen the advanced student's knowledge of the syntax, structure, and stylistic versatility of the German language.

Spring, 3 credits, ABCF grading

GER 539 Contrastive Structures: German-English

Contrastive study of the phonological, morphological, syntactic, and semantic structures of German and English.

Fall, 3 credits, ABCF grading

GER 541 Literature of the Goethe Period

A study of the literature and culture of Germany during Goethe's lifetime, 1749-1832.

Spring, 3 credits, ABCF grading

GER 544 20th-Century German Prose

Major authors of modern German fiction are read and discussed. Texts many include works by Kafka, Mann, Boll, Grass, Wolf, and Handke. The course may also focus on works by a single author.

Fall, 3 credits, ABCF grading

GER 545 20th-Century German Poetry

Intensive reading and discussion of 20th-century German poetry, including works by Rilke, Trakl, Brecht, Benn, and Kirsch. The course may also focus on a single poet or movement in the 20th century.

Spring, 3 credits, ABCF grading

GER 546 20th-Century German Drama

A survey of representative plays of the 20th century, including works by Hauptmann, Hofmannsthal, Kaiser, Sternheim, Toller, Fleisser, Horvath, and Brecht. The course may also focus on the works of a single dramatist.

Fall, 3 credits, ABCF grading

GER 547 Special Author Studies Tutorial

Fall and spring, 3 credits, ABCF grading

May be repeated for credit

GER 548 Special Period Studies Tutorial

Fall and spring, 3 credits, ABCF grading

May be repeated for credit

GER 557 History of the German Language

The development of the German language from Indo-European to modern High German: a representative selection of texts from different periods will be examined.

Fall, 3 credits, ABCF grading

GER 558 Middle High German

An introduction to Middle High German grammar with representative reading from the Middle High German classics.

Fall, 3 credits, ABCF grading

GER 562 Historical Germanic Linguistics

An introduction to the principles and methods of historical linguistics as applied to problems in the Germanic branch of Indo-European (early tribal movements, attempts at dialect grouping, dialect geography, etc.). Part of the course will be devoted to readings in Gothic, Old Norse, and Old High German with a comparison of the morphologies of these languages.

Spring, 3 credits, ABCF grading

GER 581 Independent Study

May be repeated for credit

GER 595 Practicum in Teaching

Fall and spring, 1-3 credits, S/U grading

May be repeated for credit

GER 599 Master's Thesis

May be repeated for credit

GER 601 Special Author

Tutorial to be arranged with appropriate staff member.

Fall and spring, 3 credits, ABCF grading

May be repeated for credit as topic changes

GER 602 Special Period

Tutorial to be arranged with appropriate staff member.

Fall and spring, 3 credits, ABCF grading

May be repeated for credit as topic changes

GER 800 Summer Research**Italian Courses****ITL 500 Reading Italian**

Designed to prepare graduate students to read contemporary research in their respective disciplines published in Italian, the course presents systematic instruction in the fundamentals of reading comprehension and in specialized subject-oriented vocabulary.

Fall or spring, 3 credits, ABCF grading

ITL 501 Contemporary Italy

Analysis of contemporary Italy and its civilization through the study of the development of its historical, cultural, political, and social characteristics. Designed for potential teachers of Italian at the college as well as secondary

school levels, this course emphasizes and traces the evolution of the character and institutions of contemporary Italy.

3 credits, ABCF grading

ITL 502 Special Topics in Italian Cinema

A topics course given in Italian on Italian cinema. Topics may include films of a particular actor, director, genre, theme, or historical period. Semester supplements to the Bulletin contain specific description when course is offered. May be repeated for credit as topic changes.

Prerequisite: Advanced oral and written proficiency in Italian

3 credits, ABCF grading

ITL 507 Italian Linguistics: Diachronic Development and Synchronic Structures

An examination of the linguistic evolution and the synchronic grammars (phonology, morphology, syntax) of standard Italian and some Italo-Romance dialects.

Spring, 3 credits, ABCF grading

ITL 508 Syntax and Composition

This course analyzes and discusses finer points of Italian grammar and investigates diverse writing styles. Students will develop grammatical drills from elementary through advanced levels. Literary masterpieces are translated to demonstrate types of style and possible alternatives in writing.

Spring, 3 credits, ABCF grading

ITL 510 Advanced Conversation and Composition

An examination of Italian in the context of contemporary Italy, with an eye to the effects of globalization and localism on language and culture. Class readings and conversations focus on today's multifaceted Italy, steering clear of stereotyped images and misconceptions.

Spring, 3 credits, ABCF grading

ITL 511 History of the Italian Language

A study of the development of the Italian language beginning with its Latin origins, and continuing through modern times.

Spring, alternative years, 3 credits,

ABCF grading

ITL 512 Italian Dialects

The linguistic structures of the many languages (i.e., "dialects") spoken in Italy are analyzed. Consideration is also given to the sociolinguistic situation.

Spring, alternative years, 3 credits,

ABCF grading

ITL 513 Romance Linguistics

This course examines the linguistic evolution of the Romance languages from the classical period through modern times. The synchronic grammars of Italian, French, and Spanish are examined.

Spring, 3 credits, ABCF grading

ITL 516 Seminar on Dante

The *Vita Nuova*, the *Opere Minori*, and the *Inferno* are studied based on the historical, social, and moral contexts of 13th- and 14th-century Italy. Offered as ITL 516 and CEI 526.

3 credits, ABCF grading

ITL 517 Seminar on Dante

The *Purgatorio* and *Paradiso* are studied based on the historical, social, and moral contexts of 13th- and 14th-century Italy.
Spring, 3 credits, ABCF grading

ITL 518 Boccaccio: Seminar

The course emphasizes the origin of Italian prose fiction as seen through the first attempts at the short story, such as the Novellino, but it deals mainly with Boccaccio's "Decameron" as the perfection of the genre.
Spring, 3 credits, ABCF grading

ITL 522 Seminar in Italian Humanism and Renaissance Literature

Analysis of the works of such writers as Petrarch, Boccaccio, Ariosto, Machiavelli, Castiglione, Aretino, Tasso, and Michelangelo. Study of the relation of the individual works of these writers to broader historical, cultural, and intellectual developments of the period.
Spring, 3 credits, ABCF grading
May be repeated for credit

ITL 541 Studies in 17th- and 18th-Century Italian Literature

A study of baroque and Enlightenment literatures in Italy, which also takes into consideration the development of other, peripheral genres such as opera, philosophy, and scientific prose. Authors examined include Galileo, Marino, Metastasio, Vico, Goldoni, Alfieri, and others. The topics vary from semester to semester, depending on the authors selected.
Spring, 3 credits, ABCF grading
May be repeated for credit

ITL 551 Studies in Italian Romanticism

Italian romanticism is compared with the movement as it took place in other countries, such as England, Germany, and France. The works of Foscolo, Leopardi, and Manzoni are studied in the philosophical and sociological contexts of the period.
Spring, 3 credits, ABCF grading

ITL 552 Studies in the Modern Novel

A study of the development of the Italian novel from Verga to the latest trends. Stress is placed on the major shifts in sensibility occurring at the beginning of the 19th century and after World War II.
Spring, 3 credits, ABCF grading
May be repeated for credit

ITL 562 Studies in Contemporary Literature: Contemporary Italian Poetry: The Quest for Meaning

Studies in 20th-century literature.
Spring, 3 credits, ABCF grading
May be repeated for credit

ITL 571 Free Seminar

Courses given in the past have covered a single author, genre, and other topics.
Spring, 3 credits, ABCF grading
May be repeated for credit

ITL 581 Independent Individual Studies

Fall and spring, alternative years, 1-6 credits, ABCF grading
May be repeated for credit

ITL 595 Practicum in Teaching

Fall and spring, 1-3 credits, S/U grading
May be repeated for credit

ITL 599 Thesis Research

1-6 credits, S/U grading
May be repeated for credit

ITL 800 Summer Research

May be repeated for credit

Russian and Slavic Courses**RUS 500 Reading Russian**

Intensive introductory Russian for graduate students in other programs. Practice in reading and translation; Russian prose; use of dictionaries and reference materials; as much attention as possible to special problems of various disciplines.
Spring, 3 credits, ABCF grading

RUS 504 Introduction to Cultural History

Russian cultural history focusing on recurrent values and ideas. Topics explored include issues of cultural identity, responses to the West and Asia (in such movements as Slavophilism, pan-Slavism, and Eurasian theory), gender, and ethnicity.
Spring, 3 credits, ABCF grading

RUS 508 Russian Authors

A seminar in selected Russian authors, focusing on one or two of the following: Pushkin, Gogol, Dostoevsky, Turgenev, Tolstoy.
Fall, 3 credits, ABCF grading
May be repeated for credit

RUS 509 Dostoevsky and the West

Dostoevsky's major texts viewed in cross-cultural perspective with particular emphasis on literary and philosophical traditions common to Russia and Europe.
Fall, alternative years, 3 credits, ABCF grading

RUS 511 Studies in Literary Genres

A seminar devoted to a specific genre (poetry, novel, short fiction) in Russian literature.
Spring, 3 credits, ABCF grading
May be repeated for credit

RUS 513 19th-Century Russian Literature

A seminar on 19th-century Russian literature. The course deals with prose, poetry, and drama in the context of literary movements and traditions.
Fall, 3 credits, ABCF grading

RUS 514 20th-Century Russian Literature

A seminar in turn-of-the-century, Soviet post revolutionary, and emigre Russian literature. The course deals with prose, poetry, and drama in the context of literary movements and traditions.
Fall, 3 credits, ABCF grading

RUS 520 Russian Syntax

A course in Russian syntax and advanced grammar from various theoretical frameworks.
Fall, alternative years, 3 credits, ABCF grading

RUS 595 Practicum in Teaching

Fall and spring, 1-3 credits, S/U grading
May be repeated for credit

RUS 599 Master's Thesis

May be repeated for credit

RUS 601 Studies in Cultural Genres

Explorations in different forms of Russian cultural representation offered by written texts, the arts, architecture, and popular media such as puppet theatres, the bard tradition, and cinema. Interaction among aesthetic genres will be explored with particular emphasis on the roles of literature in the other arts.
Fall, 3 credits, ABCF grading

RUS 602 Literature and Theatre

The relationship of literature and theatre with specific examples taken from Russian cultural history. The stage adaptations of Stanislavsky, Meyerhold, and contemporary directors will be studied as forms of aesthetic conjunction and as responses to the social-ideological context.
Spring, 3 credits, ABCF grading

RUS 603 Seminar in Cultural Theory

Studies in cultural theory with particular reference to the works of formalism, structuralism, the Tartu school of semiotics, and Bakhtinian theory.
Fall, 3 credits, ABCF grading

RUS 800 Summer Research

May be repeated for credit

SLV 501 Special Topics in Slavic Literature

Special topics in Slavic literature investigating an author, period, genre, or theoretical issue. Designed to provide a forum for advanced research in critical methodology.
Spring, 3 credits, ABCF grading

SLV 502 Problems of Literary Translation

The course addresses theoretical and practical problems of translation from the Slavic languages. Published translations of literary texts as well as translations prepared by participants of the seminar will be compared and analyzed.

Prerequisite: Advanced knowledge of Slavic languages

Spring, alternative years, 3 credits, ABCF grading

SLV 504 Topics in Slavic Culture

Various topics in Slavic culture will be studied including Slavic and Russian literatures and theatre.
3 credits, ABCF grading
May be repeated for credit

SLV 571 Comparative Slavic Linguistics

An investigation of the major West, East, and South Slavic languages with particular attention to their historical development. The course includes comparative and contrastive studies in the areas of phonology, morphology, and syntax.
Fall, 3 credits, ABCF grading

SLV 578 Directed Independent Studies

Fall

*May be repeated for credit***SLV 579 Directed Independent Studies II**

Spring

*May be repeated for credit***SLV 580 Special Topic in Slavic Languages I**

The study of the phonology, morphology, and syntax of a Slavic language other than Russian, e.g., Polish, Czech, Ukrainian, Serbo-Croatian, or Bulgarian. May be repeated if different language studied.

Fall, 3 credits, ABCF grading

*May be repeated for credit***SLV 581 Special Topic in Slavic Languages II**

A continuation of the study of a Slavic language other than Russian. May be repeated if different language is studied.

Spring, 3 credits, ABCF grading

*May be repeated for credit***Language Learning and Research Center Courses****DLF, DLG, DLI, DLR 601 Internship in Foreign Languages**

Students in the Doctor of Arts program assist an instructor as an aide in a literature, culture, or language course on the undergraduate level.

Fall and spring, 1-3 credits, S/U grading

DLF, DLG, DLI, DLR 602 Externship in Foreign Languages

Students in the Doctor of Arts program teach one to three courses at the high school, junior college, or college level under the supervision of a master teacher.

Prerequisite: All other coursework completed

Fall and spring, 1-3 credits, S/U grading

DLF, DLG, DLI, DLR 603 Independent Readings in Foreign Languages

Independent readings on a selected topic in French language or literature.

Fall and spring, 1-6 credits, S/U grading

*May be repeated for credit***DLF, DLG, DLI, DLR 699 Dissertation Research on Campus**

Independent research in French for the Doctor of Arts degree. Open only to candidates for the Doctor of Arts who have passed the preliminary examination.

Prerequisite: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab

Fall, spring, and summer, 1-9 credits, S/U grading

*May be repeated for credit***DLF, DLG, DLI, DLR 700 Dissertation Research off Campus—Domestic**

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, and summer, 1-9 credits,

S/U grading

*May be repeated for credit***DLF, DLG, DLI, DLR 701 Dissertation Research off Campus—International**

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must

receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

*May be repeated for credit***DLL 570 Introduction to Media for Language Teaching**

Course open to non-D.A. graduate students. Gives students an introduction to all of the technology used in teaching languages: audio, video, computer, and internet. Emphasis is on hands-on use and practical applications. Offered as DLL 570 and FLA 570.

Spring, 3 credits, ABCF grading

DLL 571 Foreign Language Technology and Education

Course open to non-D.A. graduate students. Assumes knowledge of material taught in DLL/FLA 570. Addresses more globally and more theoretically the intersection between technology and languages. Issues of cognitive learning theory and educational psychology addressed. Offered as DLL 571 and FLA 571.

Spring, 3 credits, ABCF grading

DLL 572 Practicum in Language Center Directorship

Allows students to work in a state-of-the-art language center and prepare a project dealing with technology and languages.

Spring, 3 credits, S/U grading

DLL 601 Internship in Language Center Directorship

Students work as an Associate Director of Stony Brook's Language Learning and Research Center. They learn about basic accounting, budgeting, and management in a Language Center as well as teach short courses and workshops relating to technology and languages.

Spring, 3 credits, ABCF grading

DLL 602 Externship in Language Center Directorship

As above in DLL 601 except work is done off campus in a Language Center not located at the University.

Spring, 3 credits, S/U grading

Genetics (BGE)

Graduate Program Director: Gerald Thomsen, Centers for Molecular Medicine, Room 348 (631) 632-8536

Graduate Program Coordinator: Kathryn Bell, Life Sciences Building 130 (631) 632-8812

Degree awarded: Ph.D. in Genetics

The Graduate Program in Genetics, an inter-institutional curriculum in the College of Arts and Sciences, is designed to provide training in a broad area of genetics. It offers graduate training in molecular genetics, developmental genetics, genomics and bioinformatics, evolutionary genetics, and human genetics. All students, no matter what their particular interest, are exposed to all areas of specialization offered within the curriculum. This experience ensures that the student will be prepared to take maximum advantage of the broad range of challenges that may be encountered after graduation.

The breadth of the Graduate Program in Genetics makes it likely that the entering predoctoral trainees will come from many varied backgrounds. This enriches the Genetics Program as a whole and enhances student peer interactions. The first year student experience includes laboratory rotations in which the student works in the laboratories of three or four different faculty members. These rotations allow the student to gain firsthand knowledge of the methods and approaches taken by each laboratory and provide a basis for selecting a thesis research advisor. Students have the opportunity to further broaden their knowledge by participating in journal clubs on thematic topics that are offered by faculty, and by taking elective courses from offerings both within and outside the Genetics Program. The specific elective course or courses taken by a student are determined in conjunction with a faculty advisor to best meet the student's particular needs. Trainees participate in two ongoing research seminar series. A student research seminar provides each trainee with a regular opportunity to present his or her work to colleagues and to faculty. Students also attend research seminars given by internal and visiting faculty in order to keep abreast of the latest developments and potential areas of future excitement in the field of genetics.

Facilities

The primary training facilities are Stony Brook University, Cold Spring Harbor Laboratory, and Brookhaven National

Laboratory. Program faculty at Stony Brook are drawn primarily from departments within the College of Arts and Sciences or the School of Medicine. The Life Sciences Building, which houses the Genetics Program office, is home of the Departments of Molecular Genetics and Microbiology, Biochemistry and Cell Biology, Neurobiology and Behavior, and Ecology and Evolution, all of which are represented in the Genetics Program. The University Health Sciences Center, located across the street from the Life Sciences Building, is the primary home for Departments in the School of Medicine, including faculty in the Departments of Medicine, Molecular Pathology and Immunology, Pharmacological Sciences, and Physiology and Biophysics. In addition to these departments, the program also includes faculty in the departments of Applied Mathematics and Statistics, Biomedical Engineering, and Computer Science. An important new facility at Stony Brook is the Centers for Molecular Medicine, a state-of-the-art research building adjacent to the Life Sciences Building. This building houses four interdepartmental thematic research centers: The Centers for Developmental Genetics, Infectious Diseases, Brain and Spinal Cord Research, and Structural Biology. Each of these Centers harbors Genetics Program faculty. The Centers for Molecular Medicine provide both an intellectual and a physical catalyst for facilitating interactions between Stony Brook scientists with common interest in these areas of modern biology, irrespective of their departmental affiliation.

Cold Spring Harbor is a modern, world-renowned research institute that provides numerous unique opportunities for trainees. Although the faculty at Cold Spring Harbor are not organized into departments, there is internationally recognized strength in the areas of Cancer Biology, Neurobiology, Plant Genetics, Structural Biology, and Bioinformatics. The world-class facilities that are available at Brookhaven National Laboratory provide additional unique resources for trainees in the Genetics Program, including the

National Synchrotron Light Source, one of the most unique instruments in the world for probing biological phenomenon. Research faculty at Brookhaven have widely recognized programs in the molecular biology of microbial, plant and animal systems, and have a leading role in the emerging field of Proteomics.

Admission

The Graduate Program in Genetics requires the following in addition to the minimum Graduate School admission requirements:

A. Superior undergraduate performance, which should include some formal training in genetics;

B. Report of Graduate Record Examination (GRE) General Test scores. Note that subject-specific tests (i.e., Biology) are not required, but are helpful additional information when available;

C. Three letters of recommendation;

D. Acceptance by the Graduate Program in Genetics and by the Graduate School.

The program does not require, but prefers to see, evidence of research activity as an undergraduate. Whenever possible, prospective students are encouraged to visit all three institutions for interviews with program faculty.

All students who are accepted into the program are accepted with full support. The support package for the 2005-2006 academic year includes an annual stipend of \$24,000, a full tuition scholarship, and health insurance benefits. This same package is provided each year to continuing students in the program.

Faculty

Distinguished Professors

Grollman, Arthur⁶, M.D., Johns Hopkins University: Mechanisms of DNA repair and mutagenesis in mammalian cells.

Lennarz, William J.², Ph.D., 1959, University of Illinois: Biosynthesis and function of cell surface glycoproteins.

Sternglanz, Rolf⁶, Ph.D., 1967, Harvard University: Yeast molecular genetics.

Wimmer, Eckard⁹, Dr.rer.nat., 1962, Göttingen, Germany: Poliovirus replication and picornaviral pathogenesis.

Professors

Bahou, Wadie⁵, M.D., 1980, Massachusetts Medical Center: Human genetics; gene therapy.

Bar-Sagi, Dafna³, Ph.D., 1984, Stony Brook University: Role of ras oncogenes in cell proliferation; signal transduction.

Bell, Michael⁴, Ph.D., 1976, University of California, Los Angeles: Evolutionary genetics.

Benach, Jorge³, Ph.D., 1971, Rutgers University: Infectious disease immunology.

Bliska, James B.³, Ph.D., 1988, University of California, Berkeley: Molecular and cellular basis of bacterial-host cell interactions.

Bogenhagen, Daniel⁶, M.D., 1977, Stanford University: Molecular biology of oocyte development.

Brown, Deborah², Ph.D., 1987, Stanford University: Structure and function of sphingolipid and cholesterol-rich membrane domains.

Citovsky, Vitaly², Ph.D., 1987, Hebrew University, Jerusalem: Nuclear transport and intercellular communication in plants.

Carter, Carol A.³, Ph.D., 1972, Yale University: Retroviral viral assembly and post-assembly events.

Chen, Wen-Tien⁵, Ph.D., 1979, Yale University: Cancer invasion and angiogenesis.

Dykhuisen, Daniel⁴, Ph.D., 1971, University of Chicago: Causes of natural selection in microorganisms.

Eanes, Walter⁴, Ph.D., 1976, Stony Brook University: Genetic variation in natural populations.

Fisher, Paul⁶, M.D., Ph.D., 1980, Stanford University: DNA replication; nuclear architecture; nuclear transport.

Furie, Martha B.³, Ph.D., 1980, Rockefeller University: Molecular basis of cell-cell and cell-substrate interactions.

Gergen, J. Peter², Ph.D., 1982, Brandeis University: Regulation of transcription and the genetic control of development.

Hayman, Michael J.³, Ph.D., 1973, National Institute for Medical Research, London: Mechanism of transformation by retroviral oncogenes; erythroid differentiation.

Hearing, Patrick³, Ph.D., 1980, Northwestern University: Adenovirus regulation of cellular proliferation and gene expression; vectors for human gene therapy.

Katz, Eugene³, Ph.D., 1969, University of Cambridge: Genetic studies on *Dictyostelium discoideum*.

Malbon, Craig⁶, Ph.D., 1976, Case Western Reserve University: Signal transduction and gene regulation in differentiation and development.

Mandel, Gail¹, Ph.D., 1977, University of California, Los Angeles: Regulation of gene expression in the nervous system.

Marcu, Kenneth B.², Ph.D., 1975, Stony Brook University: Immunoglobulin gene expression and recombination.

Mendell, Nancy¹¹, Ph.D., 1972, University of North Carolina, Chapel Hill: Biostatistics.

Reich, Nancy⁸, Ph.D., 1983, Stony Brook University: Signal transduction and activation of gene expression by cytokines; cellular defense responses to viral infection.

Rubin, Clinton⁹, Ph.D., 1983, Bristol University: Physical factors influencing bone, cell, and tissue kinetics; treatments.

Schechter, Nissim², Ph.D., 1970, Western Michigan University: Molecular biology of nerve development and regeneration.

Skiena, Steven¹², Ph.D., 1988, University of Illinois: Computational biology and informatics.

Smith, Steven², Ph.D., 1985, University of California, Berkeley: Structural biology.

Associate Professors

Bingham, Paul², Ph.D., 1979, Harvard University: Regulation of differentiation; transposable elements; regulation of splicing.

Dean, Neta², Ph.D., 1988, University of California, Los Angeles: Protein trafficking in yeast.

Frohman, Michael⁶, M.D., Ph.D., 1985, University of Pennsylvania: Early mammalian development.

Futcher, A. Bruce³, D.Phil., 1981, University of Oxford: Control of cell division in eukaryotic cells.

Hollingsworth, Nancy², Ph.D., 1988, University of Washington: Meiotic chromosome synapsis, recombination, and segregation in yeast.

Holdener, Bernadette², Ph.D., 1990, University of Illinois: Genetics of mammalian development.

Kernan, Maurice¹, Ph.D., 1990, University of Wisconsin: Molecular basis of mechanical senses.

Kisker, Caroline⁶, Ph.D., 1994, Free University of Berlin, Germany: Structure/function relationships of macromolecules using crystallography and biochemical methods.

Konopka, James³, Ph.D., 1985, University of California, Los Angeles: Cell growth and development in yeast; pheromone signal transduction.

Leatherwood, Janet³, Ph.D., 1993, Johns Hopkins University: Cell cycle control of DNA replication.

Mackow, Erich⁵, Ph.D., Temple University: Rotavirus and hantavirus pathogenesis; virus directed cell signaling and transcriptional responses.

Moll, Ute⁸, M.D., 1985, University of Ulm: Tumor suppressor genes; role of p53 in human cancer.

Prives, Joav⁶, Ph.D., McGill University: Regulation of surface receptors in muscle cells.

Reinitz, John¹¹, Ph.D., 1988, Yale University: Computational biology; modeling of gene regulatory networks.

Schindelin, Hermann², Ph.D., 1994, Free University of Berlin, Germany: Structure/function relationships of macromolecules using crystallography and biochemical methods.

Thomsen, Gerald², Graduate Program Director. Ph.D., 1988, Rockefeller University: Vertebrate embryo development.

Assistant Professors

Bharathan, Geeta⁴, Ph.D., 1993, University of Arizona: Plant development and evolution.

Canli, Turhan¹³, Ph.D., 1993, Yale University: Biopsychology; neural and genetic basis of emotion and cognition.

Carpino, Nicholas³, Ph.D., 1997, Stony Brook University: Positive and negative regulation of T cell receptor signaling.

Cohen, J. Craig¹⁴, Ph.D., 1976, Ph.D., University of Mississippi Medical Center: Molecular genetics and physiology; gene therapy.

Colognato, Holly⁶, Ph.D., 1999, Rutgers University: Extracellular matrix in the brain; roles during development and during neurodegeneration.

Crawford, Howard⁶, Ph.D., 1993, University of Texas Southwestern Medical Center at Dallas: Pancreatic cancer.

Hadjiargyrou, Michael⁹, Ph.D., 1992, City University of New York: Human molecular genetics; functional genomics.

Hearing, Janet C.³, Ph.D., 1984, Stony Brook University: Replication and maintenance of the Epstein-Barr virus genome in tumor cells.

Hsieh, Jen-Chih², Ph.D., 1994, Duke University: The molecular mechanism of Wnt signaling.

Karzai, Wali², Ph.D., 1995, Johns Hopkins University: Structure and function of RNA-binding proteins and biochemical studies of the SmpB-SsrA quality control system.

Neiman, Aaron², Ph.D., 1994, University of California, San Francisco: Developmental regulation of the secretory pathway.

Sirotkin, Howard¹, Ph.D., 1996, Albert Einstein: Specification and patterning of the neural plate; vertebrate developmental genetics.

Takemaru, Ken-Ichi⁶, Ph.D. Graduate University for Advanced Studies, Japan: Wnt signaling in development and disease.

Thanassi, David³, Ph.D., 1995, University of California, Berkeley: Biogenesis of bacterial adhesion organelles.

True, John⁴, Ph.D., 1995, Duke University: *Drosophila* melanin patterning; developmental genetics and natural selection.

Tsirka, Stella⁶, Ph.D., 1989, Aristotelian University of Thessaloniki, Greece: Tissue plasminogen activator in the mammalian hippocampus; neuronal-microglial interactions.

White, Thomas¹², Ph.D., 1994, Harvard Medical School: Gap junction functions defined by genetic diseases and gene knockouts.

Zong, Wei-Xing³, Ph.D., 1999, UMDNJ-Robert Wood Johnson Medical School: Molecular regulation of apoptotic and necrotic cell death.

Adjunct Faculty at Cold Spring Harbor Lab

Cline, Hollis, Professor. Ph.D., 1985, University of California, Berkeley: Neuronal development and plasticity.

Dubnau, Josh, Assistant Professor. Ph.D., 1995 Columbia University: Learning; memory; genetics; behavior.

Enikolopov, Grigori, Associate Professor.

Ph.D., 1978, USSR Academy of Sciences: Signal transduction in neurons.

Hannon, Greg, Professor. Ph.D., 1992, Case Western Reserve University: Growth control in mammalian cells.

Hatchwell, Eli, Investigator. M.D., 1985, University of Cambridge; Ph.D., 1995, University of Oxford: Sporadic human genetic disease.

Hirano, Tatsuya, Professor. Ph.D., 1989, Kyoto, Japan: Higher order chromosome structure and function.

Huang, Z. Josh, Associate Professor. Ph.D., 1994, Brandeis University: Neuroscience; experience-dependent development of the neocortex; mouse genetics; neurotrophins.

Jackson, David, Associate Professor. Ph.D., 1991, East Anglia, England: Plant development; genetics, cell-to-cell mRNA, and protein trafficking.

Joshua-Tor, Leemor, Professor. Ph.D., 1990, Weizmann: Structural biology and molecular recognition.

Krainer, Adrian R., Professor. Ph.D., 1986, Harvard University: Mammalian mRNA splicing; regulation of alternative splicing; biochemistry of spliceosome assembly and RNA cleavage-ligation; origin and evolution of introns.

Lazebnik, Yuri, Professor. Ph.D., 1986, St. Petersburg State University: Apoptosis; caspases; cancer chemotherapy; proteases.

Lowe, Scott, Professor. Ph.D., 1994, Massachusetts Institute of Technology: Apoptosis; anti-cancer therapy resistance.

Lukowitz, Wolfgang, Assistant Professor. Ph.D., 1996, University of Tübingen: Genetics, development, plant biology; gene expression, signal transduction; plants.

Malinow, Roberto, Professor. M.D., 1984, New York University: Synaptic transmission and plasticity in rodent hippocampus.

Martienssen, Robert, Professor. Ph.D., 1986, University of Cambridge: Plant developmental genetics; transposable elements; chloroplast biogenesis.

McCombie, Richard, Professor. Ph.D., 1982, University of Michigan: Computational molecular biology.

Mills, Alea, Associate Professor. Ph.D., 1997, University of California, Irvine: Functional genomics; tumorigenesis; development.

Mittal, Vivek Assistant Professor. Ph.D., 1994, Jawaharlal Nehru University: Tumor-mediated neovascularization; Id transcription factors; transcription profiling; RNA interference; dendritic cells.

Muthuswamy, Senthil, Assistant Professor. Ph.D., 1995, McMaster University: Understanding cancer initiation using 3-D epithelial structures.

Neuwald, Andrew, Associate Professor. Ph.D., 1987, University of Iowa: Classification and modeling of protein domains; protein structure and function prediction.

Powers, Scott, Associate Professor. Ph.D., 1983, Columbia University: Cancer gene discovery; cancer diagnostics and therapeutics; cancer biology.

Sebat, Jonathan, Assistant Professor. Ph.D., 2002, University of Idaho: Copy number variation; segmental duplication; genetics; neurogenetics; ROMA; microarray.

Skowronski, Jacek, Associate Professor. M.D., Ph.D., 1981, Lodz, Poland: HIV genes and signal transduction in T cells.

Spector, David, Professor. Ph.D., 1980, Rutgers University: Functional organization of the mammalian cell nucleus.

Stenlund, Arne, Associate Professor. Ph.D., 1984, Uppsala, Sweden: DNA replication of bovine papillomas.

Stillman, Bruce, Professor. Ph.D., 1979, Australian National: Eukaryotic DNA replication and its control.

Tansey, William, Associate Professor. Ph.D., 1991, University of Sydney: Cell cycle; gene regulation.

Timmermans, Marja, Associate Professor. Ph.D., 1996, Rutgers University: Plant development.

Tully, Timothy, Professor. Ph.D., 1981, University of Illinois: Genetics of memory formation in *Drosophila*.

VanAelst, Linda, Associate Professor. Ph.D., 1991, Leuven, Belgium: Role of Ras in mammalian cell transformation.

Wigler, Michael H., Professor. Ph.D., 1978, Columbia University: Signal transduction and growth control in eukaryotes.

Xu, Rui-Ming, Professor. Ph.D., 1990, Brandeis University: Structural biology; protein-RNA interactions.

Zhang, Michael, Professor. Ph.D., 1987, Rutgers University: Computational biology and genome informatics.

Zhong, Yi, Professor. Ph.D., 1991, University of Iowa: Neurophysiology; *Drosophila*; learning and memory; neurofibromatosis; signal transduction.

Research Faculty at Brookhaven National Laboratory

Anderson, Carl W., Geneticist. Ph.D., 1970, Washington University: Molecular biology of adenovirus assembly; protein synthesis.

Burr, Benjamin, Geneticist. Ph.D., 1969, University of California, Berkeley: Transposable genetic elements in maize.

Burr, Frances, Botanist. Ph.D., 1968, University of California, Berkeley: Transposable genetic elements in maize.

Dunn, John J., Senior Microbiologist. Ph.D., 1970, Rutgers University: Transcription, processing, and translation of RNA.

Freimuth, Paul, Associate Biochemist. 1986, Columbia University: Mechanism of adenovirus entry into cells; role of cell adhesion molecules.

Fu, Dax, Assistant Professor. Ph.D., 1996, Mayo Graduate School of Medicine: Structures of representative channel and transporter proteins.

Studier, F. William, Senior Biophysicist. Ph.D., 1963, Caltech: Genetics and physiology of bacteriophage T7.

Number of teaching, graduate, and research assistants, fall 2005: 65

- 1) Department of Neurobiology and Behavior
- 2) Department of Biochemistry and Cell Biology
- 3) Department of Molecular Genetics and Microbiology
- 4) Department of Ecology and Evolution
- 5) Department of Medicine
- 6) Department of Pharmacological Sciences
- 7) Department of Oral Biology and Pathology
- 8) Department of Pathology
- 9) Department of Orthopaedics
- 10) Department of Computer Sciences
- 11) Department of Applied Mathematics and Statistics
- 12) Department of Biophysics and Physiology
- 13) Department of Psychology
- 14) Department of Pediatrics, Neonatology

Degree Requirements Requirements for the M.A. Degree

The Graduate Program in Genetics normally does not accept a student whose goal is a master's degree. In exceptional instances, a student already in the graduate program may be awarded an M.A. degree upon completing an approved course of study, including a minimum of 30 graduate credit hours, passing a comprehensive examination, presenting and defending a research thesis, and fulfilling the minimum requirements of the Graduate School. A student must achieve an overall 3.0 grade point average in all graduate course taken at Stony Brook to receive a degree.

Requirements for the Ph.D. Degree

In addition to the requirements of the Graduate School, the following are required:

A. Course Requirements

1. Molecular Genetics (HBM 503/BMO 503/MCB 503)
2. Graduate Genetics (BGE 510)
3. Graduate Biochemistry (MCB 520)
4. Cell Biology (MCB 656)
5. Graduate Student Seminar in Genetics (BGE 531) must be taken each semester.
6. Three semesters of Journal Club (BGE 691) typically taken during the first and second years of study. Students select from thematic journal club topics that are organized each semester by fac-

ulty at the different institutions. This exercise provides important training in critical analysis of the literature while also allowing students to broaden their knowledge base on selected topics of interest.

7. An elective course approved by the program director. Typically these courses are in the Biological Sciences (e.g., Developmental Biology, MCB 657; Immunology, HBP 533; Microbiology, HBM 640; or Molecular Evolution, BEE 565), but courses may also be taken in other relevant areas (e.g., Computer Sciences, Bioengineering).

8. Two semesters of Laboratory Rotation in Genetics (BGE 530). Students will generally work in the laboratories of three or four different faculty members during the first year. The particular laboratories are determined by students based on their interactions with individual faculty and must be approved by the graduate program director.

9. Integrity in Science (GRD 500). This required one-semester course on ethics is typically taken in the spring semester of the student's first year.

10. Requirements for any specific student, in addition to those enumerated above, that will be beneficial due to a student's prior training and/or area of specialization will be determined by the program director and executive committee in conjunction with the student and appropriate advisory committee.

B. Comprehensive (Preliminary) Examination

At the beginning of the fourth semester, students will take a written comprehensive (preliminary) examination covering all areas of genetics.

C. Thesis Proposal Examination

After successful completion of the comprehensive (preliminary) examination, the student prepares a written proposal for the thesis research project. This proposal has a format of a grant application, including information of the background and significance of the project, a detailed research plan, and any preliminary results that the student has generated that indicate the feasibility of the project. This written proposal is orally defended before a thesis proposal examination committee. This committee does not include the student's thesis advisor, but is selected by the student in conjunction with his

or her advisor and program director. The thesis proposal defense should occur during the fifth semester of graduate study. Generally, the faculty who participate in a student's thesis proposal examination committee then join with the thesis advisor to form the student's thesis advisory committee.

D. Advancement to Candidacy

After successful completion of all required and elective courses, the comprehensive (preliminary) examination, and the thesis proposal examination, the student will be recommended to the Graduate School for advancement to candidacy.

E. Ph.D. Dissertation

The research for the Ph.D. dissertation is conducted under the supervision of the thesis advisory committee. Upon approval of the completed dissertation by this committee, a formal public oral defense of the dissertation is scheduled, at which the student presents his or her findings and is questioned by members of the examining committee and by other members of the audience.

F. Teaching Requirement

It is expected that each graduate student completing a doctoral degree will have functioned as a teaching assistant during at least two semesters of his or her graduate career (BIO 600).

G. Residence Requirement

The University requires at least two consecutive semesters of full-time graduate study. The demands of the course of study necessitate a longer period of residence.

Courses

BGE 510 Graduate Genetics

This course investigates fundamental aspects of the transmission and expression of genetic information in prokaryotic and eukaryotic systems. The course is organized in a way that allows the students to appreciate the breadth of genetics research, while also gaining an in-depth understanding of selected important topics. Students explore the use of both classical and molecular genetic approaches to understand biological processes in genetics model systems including yeast, flies, worms, mouse, and man.

Spring, 3 credits, ABCF grading

BGE 530 Laboratory Rotation

The student rotates through laboratories of four different genetics program faculty members during the first year. The selection of the laboratories is made by the student, in con-

junction with individual faculty, and with the approval of the program director. By taking part in ongoing projects, the student will learn experimental procedures and techniques and become acquainted with research opportunities in the participating programs.
*Fall and spring, 1-8 credits, S/U grading
May be repeated twice for credit*

BGE 531 Graduate Student Seminar in Genetics

Students have the opportunity to present their research to other students and faculty on an annual basis. Students in the first or second year will present brief seminars as part of a one-day symposium with all of their classmates. Advanced students present research seminars as part of a weekly research seminar series that is attended by faculty and students. Although the first and second year students do not present in this weekly seminar series, they should attend these seminars as it provides an excellent mechanism for learning about current areas of research interest.

*Fall and spring, 0-1 credits, S/U grading
May be repeated for credit*

BGE 550 Genetics Outside Seminar

Outside seminars and special topics courses in areas relating to genetic studies.

*1-4 credits, ABCF grading
May be repeated for credit*

BGE 599 Graduate Research

Original investigation undertaken with the supervision of a member of the program.

*Fall and spring, 1-9 credits, S/U grading
May be repeated for credit*

BGE 691 Readings in Genetics

Journal Club on thematic topics in different areas of current genetics research.

*Fall and spring, 1 credit, ABCF grading
May be repeated for credit*

BGE 699 Dissertation Research on Campus

*Prerequisite: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab
Fall, spring, and summer, 1-9 credits, S/U grading*

May be repeated for credit

BGE 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and the Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

BGE 701 Dissertation Research off Campus-International

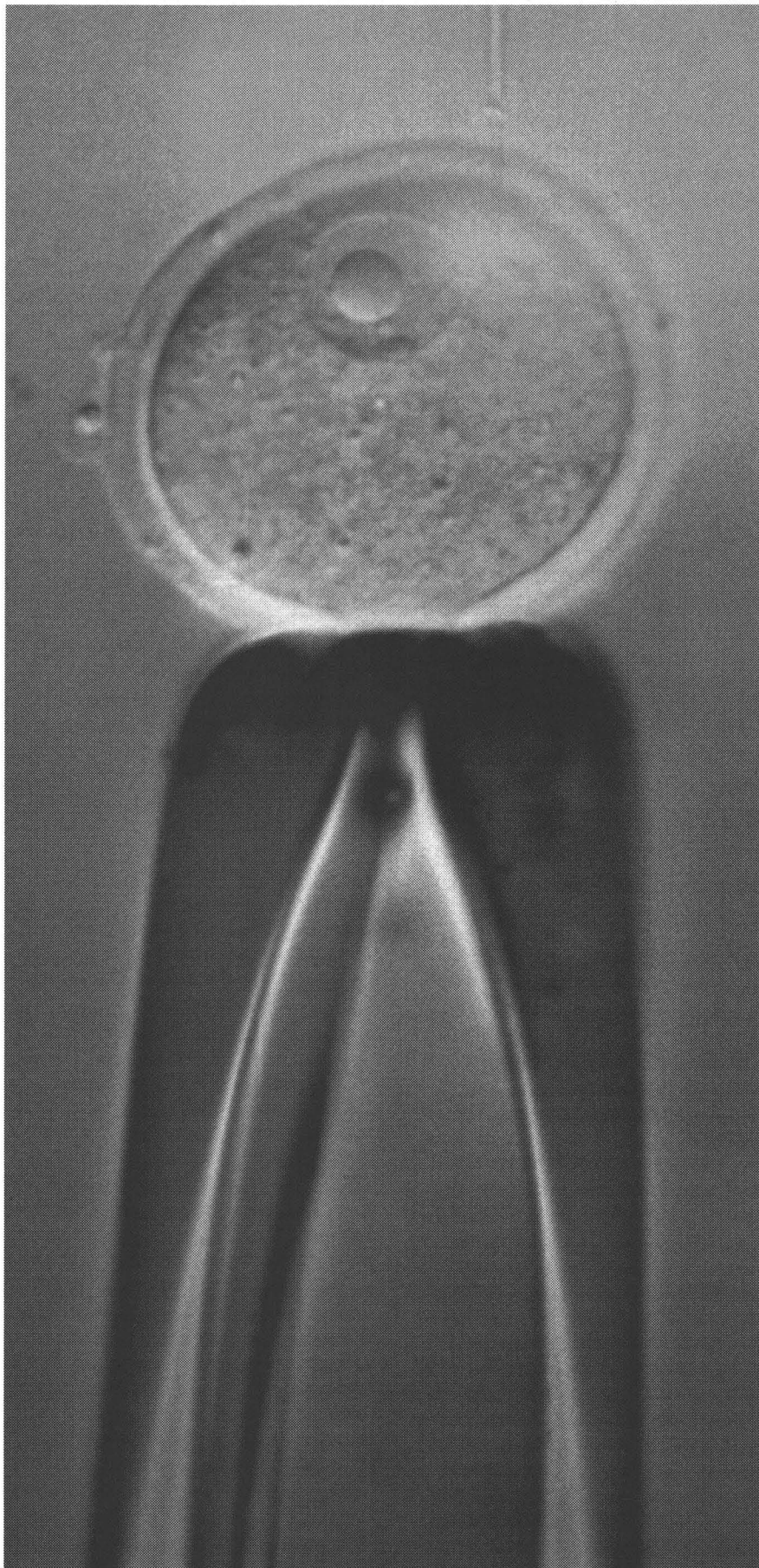
Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

BGE 800 Summer Research

May be repeated for credit



Geosciences (GEO)

Chairperson: Teng-fong Wong, Earth and Space Sciences Building 252 (631) 632-8139

Graduate Program Director: Lianxing Wen, Earth and Space Sciences Building 230 (631) 632-1726

Graduate Coordinator: Loraetta Budd, Earth and Space Sciences Building 255 (631) 632-8554

Degrees awarded: M.S. in Geosciences; Ph.D. in Geosciences

As the core discipline examining Earth's natural processes and materials, Geosciences boasts unparalleled diversity. Spurred by urgent scientific and social questions, ranging from environmental concerns to the origin and evolution of the planet itself, the Geosciences are experiencing remarkable growth, with excellent career opportunities. The Geosciences encompass many disciplines including geology, geochemistry, and geophysics, and its interdisciplinary nature fosters natural links not only with chemistry and physics, but also with environmental science, materials science, engineering, biology, and health fields. Developments in technology and new innovative approaches have transformed graduate study in many areas within Geosciences, and students participate in research utilizing state-of-the-art instrumentation and facilities.

Graduate students may choose among degree programs with emphasis in different areas in Geosciences. Ph.D. and M.S. thesis-based programs are offered with concentrations in areas including seismology and tectonics, mineral and rock physics, crystal chemistry, geochemistry, petrology, and sedimentary geology (described in more detail below). There is also a non-thesis M.S. program in hydrogeology focused primarily on training professionals in environmentally related fields. Also offered is an M.A. in Teaching Earth Science, which leads to provisional certification for teaching earth science in secondary schools of New York State.

The Department of Geosciences occupies a modern, well-equipped building that houses extensive experimental and analytical labs, faculty and graduate student offices, numerous computers and workstations, a machine shop, an electronics support group, and the Geosciences Resource Room. The Mineral Physics Institute, the Long Island Groundwater Research Institute (LIGRI), the Marine Sciences Research Center (MSRC), and nearby Brookhaven National Laboratory offer additional support and laboratory facilities for graduate student research. In particular,

the National Synchrotron Light Source (NSLS) at Brookhaven offers unparalleled opportunities for faculty and graduate students to perform unique experiments requiring high-intensity X-rays and is only 20 miles away.

Areas of Emphasis in Graduate Study and Research

The Department's philosophy has been to pursue excellence by concentrating its research initiatives in specific areas of the Geosciences. Graduate students benefit from greater focus and also enjoy close interaction with faculty members. A distinctive aspect of graduate study in the Geosciences department is the opportunity for collaborative research, often involving several faculty members. The department's extensive state-of-the-art computers, laboratory facilities and modern instrumentation have helped to foster a well-earned reputation for observational, experimental, multi-faceted approaches to Geosciences research. Cooperative programs with other departments, nearby institutions, and national laboratories provide access to unique facilities (e.g., NSLS).

Seismology, Tectonics, and Shallow Surface Geophysics

A primary focus in seismology and tectonics is the determination of detailed three dimensional earth structure, from the core to the surface, and related studies on the dynamics that drives mantle convection, deformation of the lithosphere, and plate tectonics in general. Particular emphasis is placed on interdisciplinary research and collaboration, where inferences made from seismological, geodynamic, and geodetic investigations are integrated with findings from the fields of mineral and rock physics, geochemistry, and petrology. Areas of specific focus in seismology include inner core structure, anisotropy, and attenuation, outer core structure, core-mantle boundary structure, upper mantle structure, strong ground motion studies, earthquake source parameter studies, and theoretical studies on seismic

wave propagation. Investigations in tectonophysics include the coupling between mantle convection and lithospheric dynamics, the development of the kinematics, mechanics, and seismicity within plate boundary deformation zones, and the inference of mantle flow beneath the lithosphere. Current projects involve using earthquake and space geodetic data to infer the deformation fields and employing numerical, analytical, and analog modeling to understand surface geodynamical observations, ranging from geoid, topography, plate motions and surface deformations in the global and regional scales to the partitioning of strain and tectonic implications at geometrically complex plate margins. All of these projects emphasize the use of integrated seismic, structural, geodetic, and field data to understand the structure, composition, and dynamics of the Earth's interior, as well as the driving forces for plate movements and deformations. The topics in shallow surface geophysics include field geophysical surveys of glaciotectonic deformation of Long Island sediments using ground penetrating radar, electrical resistivity, seismic reflection, and refraction as well as borehole geophysics.

Mineral and Rock Physics

Research in these fields focuses on the investigation of the structure and composition of the Earth, geophysical properties of Earth materials, and the mechanical behavior of the crust and mantle. An important emphasis is the study of high-pressure and high-temperature phases and assemblages, particularly those of relevance to the mantle. In situ measurement of elastic properties, compressibility, and determination of crystal structure complement studies of high-pressure phase relations for constraining models for Earth's mantle and equations of state for mantle phases. Specific projects include determination of ultrasonic wave velocities of minerals and rheological determination of the strength of minerals at the pressure and temperature

conditions of the Earth's mantle to depths greater than 500 km. Research initiatives in these areas are closely linked to the activities of the Mineral Physics Institute at Stony Brook and the NSF Consortium for Materials Properties Research in Earth Sciences (COMPRES). Facilities available in the Department of Geosciences and the Mineral Physics Institute include equipment for ultrasonic interferometry, Brillouin spectroscopy, and multi-anvil apparatus for experiments at high pressure and temperature; these are all integrated with synchrotron X-ray sources at the NSLS. Complete single-crystal and powder X-ray diffraction facilities and transmission electron microscopy and electron diffraction are available. Another important area of study is rock physics, fluid flow, and earthquake mechanics. Experimentally and theoretically based, this program focuses on brittle fracture, mechanical compaction of porous rock, strain localization, frictional instability, and hydromechanical behavior. The rock mechanics laboratory includes a triaxial press, an acoustic emission system, and permeameters.

Crystal Chemistry and Crystallography

The department has a strong background in the study of earth materials at the atomic and molecular level, and in using the results of these studies to interpret the properties of materials constituting Earth from crust to core. Two centers of excellence, the Center for Environmental Molecular Sciences (CEMS) and the Mineral Physics Institute (MPI), concentrate on the behavior of upper crustal and Earth's Interior, respectively. Both employ a wide range of structural probes, some located in the department and others located at national and international synchrotron X-ray and neutron facilities. Within the department, extensive facilities for single-crystal and powder X-ray diffraction, with capabilities for in situ high-temperature and high-pressure studies exist. Projects emphasize crystal structure studies on oxides, hydroxides, sulfides, carbonates, and silicates, including characterization of phase transitions, ordering phenomena, and ion exchange. Convenient access to the Brookhaven National Laboratory and the National Synchrotron Light Source (NSLS) provides opportunities for unique experiments requiring a high-intensity X-ray source. Other projects utilize X-ray

absorption spectroscopy to examine local structure in minerals and neutron diffraction for studies of hydrous phases. Many of the department's faculty are actively engaged in the design and construction of the next generation of beamlines required for high pressure and environmental investigations. These facilities are being designed with the requirements of the Stony Brook and wider national and international user base in mind. This work is complemented by electron diffraction using the department's transmission electron microscope.

Geochemistry

There are broad opportunities for graduate study and research in many areas of geochemistry. Major initiatives exist in isotope and trace-element geochemistry, aqueous and hydrothermal geochemistry, geochemistry of mineral/fluid interfaces, and theoretical and experimental geochemistry of mineral-melt systems. All programs have a strong experimental foundation, and many integrate experimental work with field studies.

Specific areas of research utilizing trace elements and radiogenic isotopes include evolution of Archean and Phanerozoic crust and geochronology of lithologic assemblages. These integrate with petrologic studies of sedimentary, metamorphic, and igneous terranes throughout the world. Research involving the chemistry and structure of sulfide and carbonate mineral surfaces are among the programs in low-temperature aqueous geochemistry; these include emphasis on geocatalysis, crystallization and trace element incorporation mechanisms, as well as the role of sulfides in the origin of life. Field-related studies focus on fluid chemistry in active hydrothermal systems. Research on silicic melts combines theoretical and experimental approaches for characterizing speciation and crystal-melt equilibria, and also for examining nucleation and growth. Closely related experimental studies focus on phase equilibria, solid-solution models, and the development of geothermometers and geobarometers, including applications in field studies.

Experimental and analytical work makes use of the department's electron microprobe, transmission electron microscope, thermal ionization mass spectrometers, FT-IR, Mössbauer lab, DCP and ion chromatography labs,

X-ray diffraction facilities, and three synthesis and experimental petrology labs. Additional work uses facilities in other Stony Brook departments, including NMR spectrometers located in the Department of Chemistry, as well as facilities at nearby Brookhaven National Laboratory, including the NSLS.

Petrology

Opportunities for graduate study and research in petrology range from atomic-scale investigations, for example, dealing with the structure of glasses, to global questions regarding the relationships of magmatic suites to large-scale mantle and crustal processes. Projects include spectroscopic and quantum chemical approaches for examining mechanisms of volatile dissolution and crystal nucleation in melts and experimental investigations of the effects of pressure, temperature, and volatile composition on stabilities of minerals and melts, with corresponding development of thermodynamic models. Field and laboratory work are integrated in some studies. Experiments are being applied to Martian meteorites.

This work is supported by experimental facilities that contain controlled-atmosphere gas-mixing furnaces, cold-seal bombs, piston-cylinder apparatus, internally heated pressure vessels, as well as multi-anvil apparatus for experiments at high temperature and pressure conditions. Analytical facilities include an electron microprobe, a transmission electron microscope, thermal ionization mass spectrometers, a Mössbauer lab, and X-ray diffraction facilities.

Sedimentary Geology

Research initiatives in sedimentary geology at Stony Brook integrate geochemistry with field, petrologic, and stratigraphic studies. Trace element and isotopic studies of terrigenous sedimentary rocks provide information on their provenance, age, and composition, which yield insight to broader issues of crustal evolution, including sediment subduction, growth of continental crust and the sedimentary mass, and recycling of sedimentary rocks. Carbonate rocks and their diagenesis are another important area of research that utilizes a wide range of approaches. Petrography is combined with microanalytical techniques for trace elements and both stable and radiogenic isotopes to reconstruct the diagenetic environments and the

physicochemical characteristics of paleohydrologic systems. Emphasis is also placed on the quantitative modeling of rock-water interaction. A strong component of fieldwork is common for studies of both clastics and carbonates. Analytical facilities include the department's electron microprobe, optical and cathodoluminescence petrography and electron microscopy facilities, a mass spectrometry lab, a Mössbauer lab, DCP and ion chromatography labs, X-ray diffraction facilities, and a variety of facilities at the NSLS.

Hydrogeology

The M.S. program with a concentration in hydrogeology is designed to give those with a B.S. degree in physical sciences a solid foundation of theoretical and practical graduate training emphasizing the physical and geochemical aspects of hydrogeology. Coursework and a final research project totaling 30 graduate credits are arranged to accommodate working professionals, with most courses taught in the evenings. A formal thesis is not required. Coursework includes groundwater hydrology, aqueous geochemistry, rock and soil physics, numerical hydrology, statistics and probability, and organic contaminant hydrology. Final research projects are arranged individually with faculty supervisors and are designed to give students experience in field, laboratory, or theoretical approaches.

Admission

For admission to the Graduate Program in Geosciences, the following, in addition to the Graduate School requirements, are required:

A. A bachelor's degree in one of the earth or space sciences or in biology, chemistry, physics, mathematics, or engineering;

B. A minimum average of B for all undergraduate coursework and a B average for courses in the sciences;

C. Results of the Graduate Record Examination (GRE) General Test;

D. Acceptance by both the Department and the Graduate School.

In special cases, a student not meeting requirements A and B may be admitted on a conditional basis. Upon admission, the student will be informed of the requirements that must be satisfied for termination of this status.

Distinguished Professors

Lindsley, Donald H., *Emeritus*. Ph.D., 1961, Johns Hopkins University: Application of phase equilibrium studies of silicate and oxide minerals to metamorphic and igneous petrology.

Weidner, Donald J., Ph.D., 1972, Massachusetts Institute of Technology: Structure of the Earth's interior as revealed by seismic waves and laboratory determinations of physical properties.

Distinguished Service Professors

Hanson, Gilbert N., Ph.D., 1964, University of Minnesota: Application of radiometric and geochemical methods to petrologic and tectonic problems.

Liebermann, Robert C., Ph.D., 1969, Columbia University: Mineral physics; elastic and anelastic properties of rocks and minerals and their applications to the Earth's interior.

Professors

Davis, Daniel M., *Undergraduate Program Director*. Ph.D., 1983, Massachusetts Institute of Technology: Quantitative geophysical modeling of fold and thrust belts; geodynamic modeling of the state of stress in the lithosphere.

Holt, William E., *Graduate Program Director*. Ph.D., 1989, University of Arizona: Seismotectonics; kinematics and dynamics of crust and mantle deformation; earthquake source parameter studies.

McLennan, Scott M., Ph.D., 1981, Australian National University: Geochemistry of sedimentary rocks; sedimentary petrology.

Nekvasil, Hanna, Ph.D., 1986, Pennsylvania State University: Experimental and thermodynamic investigations of mineral/melt equilibria in silicic magmas.

Parise, John, Ph.D., 1980, James Cook University of North Queensland: Synthesis and characterization of zeolites for use as selective catalysts; characterization using normal X-ray and neutron diffraction techniques; investigation of crystallizing gels using small-angle neutron scattering; structural modeling of silicates.

Reeder, Richard J., Ph.D., 1980, University of California, Berkeley: Low-temperature geochemistry; mineralogy; crystal chemistry.

Schoonen, Martin A.A., Ph.D., 1989, Pennsylvania State University: Kinetics and thermodynamics of low-temperature and hydrothermal water-rock interaction; theoretical geochemical modeling; geochemistry of natural waters.

Wong, Teng-fong, Ph.D., 1980, Massachusetts Institute of Technology: Experimental rock physics; fault mechanics.

Associate Professors

Wen, Lianxing, Ph.D., 1998, California Institute of Technology: Mantle rheology and dynamics; seismic structures of the Earth's mantle; new techniques for calculating viscous flow and seismic wave propagation.

Assistant Professors

Phillips, Brian, Ph.D., 1990, University of Illinois at Urbana-Champaign: Aqueous geochemistry; NMR spectroscopy; mineralogy and structural chemistry of silicates and other oxides.

Rasbury, E. Troy, Ph.D., 1998, Stony Brook University: Sedimentary geochemistry; geochronology; chronostratigraphy.

Lecturer

Stidham, Christiane Wilson, Ph.D., 1999, University of California, Berkeley: Geophysics.

Affiliated Faculty

Distinguished Professor

Aller, Robert C.¹, Ph.D., 1977, Yale University: Marine geochemistry; early marine diagenesis.

Distinguished Service Professor

Krause, David W.², Ph.D., 1982, University of Michigan: Vertebrate paleontology; mammalian evolution, including primates.

Professors

Bokuniewicz, Henry J.¹, Ph.D., 1976, Yale University: Marine geophysics.

Cochran, J. Kirk¹, Ph.D., 1979, Yale University: Marine geochemistry; use of radionuclides as geochemical tracers; diagenesis of marine sediments.

Flood, Roger D.¹, Ph.D., 1978, Massachusetts Institute of Technology, Woods Hole Oceanographic Institution: Marine geology; sediment dynamics; continental margin sedimentation.

Harbottle, Garman³, Ph.D., 1949, Columbia University: Nuclear chemistry; archeology.

Associate Professor

Forster, Catherine A.², Ph.D., 1990, University of Pennsylvania: Vertebrate paleontology; systematics; functional morphology.

Research Associate Professors

Chen, Jiuhua⁴, Ph.D., 1994, Institute of Materials Structure Science, KEK: Mineral physics; mantle petrology; application of synchrotron radiation to earth sciences.

Li, Baosheng⁴, Ph.D., 1996, Stony Brook University: Mineral physics; elasticity of minerals; high-pressure research.

Vaughan, Michael T.⁴, Ph.D., 1979, Stony Brook University: Experimental geophysics; crystallography; synchrotron X-ray studies.

Assistant Professor

O'Leary, Maureen², Ph.D., 1997, Johns Hopkins University: Vertebrate paleontology; phylogenetic systematics; mammalian evolution.

1) Marine Sciences Research Center

2) Department of Anatomical Sciences

3) Brookhaven National Laboratory

4) Mineral Physics Institute

Degree Requirements

The Department of Geosciences offers programs leading to the M.A.T., M.S., and Ph.D. degrees in the Geosciences. The Master of Arts in Teaching degree in Earth Science is a non-thesis degree for which all requirements can be completed in three semesters.

The M.S. degree with concentration in Hydrogeology is a non-thesis M.S. with most courses offered at times appropriate for working professionals.

The M.S. degree in Geosciences with thesis is typically not a terminal degree. Many students seeking Ph.D. candidacy first earn an M.S. degree.

Students become candidates for the Ph.D. in Geosciences by completing preparatory work leading to successful completion of the Ph.D. preliminary examination. Students are urged to obtain a more detailed description of procedures from the *Geosciences Graduate Handbook*.

Final responsibility for adhering to degree requirements and meeting all deadlines rests solely with the student.

Requirements for the Ph.D. Degree in Geosciences

Advancement to Ph.D. candidacy is gained after the successful completion of the Ph.D. preliminary examination. The examination is the culmination of an evaluative process that begins when the student arrives at Stony Brook. In particular, the faculty seek evidence of scientific creativity, originality, vigor, and flexibility, along with the basic background knowledge, skills, and critical faculties needed to carry out advanced independent research in the student's chosen field. The minimum residence requirement is two consecutive semesters of graduate study. There is no language requirement.

A. Course Requirements

Course requirements are flexible and are determined in consultation with the student's academic advisory committee at the beginning of studies. Academic advisory committees are assigned to students at the time of their arrival at Stony Brook, and the composition of the committee may be changed at the student's request, with the approval of the graduate program director. During their first two years in the program, students generally take one to three courses per semester. In addition, they

participate in appropriate formal and informal seminars. During their first fall semester, all students must take GEO 500, Geosciences Research Seminar. In addition, all students must register for GEO 696, Geoscience Colloquium, and GEO 697, Geoscience Seminar, each semester, and GEO 600, Practicum in Teaching, at least once. Among the courses offered are:

GEO 503 Mineral Equilibria

GEO 507 Petrogenesis

GEO 514 Physical Hydrogeology

GEO 515 Geohydrology

GEO 517 Crystal Chemistry

GEO 518 Carbonate Sediments

GEO 519 Geochemistry of Natural Waters

GEO 521 Isotope and Trace Element Geology

GEO 524/MAR 524 Organic Contaminant Hydrology

GEO 526 Low-Temperature Geochemistry

GEO 533 Geochemistry of the Solid Earth

GEO 550 Global Tectonics

GEO 551 Physics of the Earth I

GEO 552 Physics of the Earth II

GEO 556 Solid-State Geophysics

GEO 564/AMS 562 Numerical Hydrology

GEO 573 Hydromechanical Behavior of Geomaterials

A number of other courses are offered periodically according to student demand, either in a formal classroom setting or as Directed Studies (GEO 585). These include the following courses:

GEO 505 Experimental Petrology Laboratory

GEO 506 Theoretical Petrology

GEO 508 Rock-Forming Minerals

GEO 522 Planetary Sciences

GEO 528 Carbonate Geochemistry

GEO 531 Crystalline Solids

GEO 532 Solid-State Geochemistry

GEO 535 Regional Structure and Tectonics

GEO 542 Inverse Theory

GEO 562/MAR 562 Early Diagenesis of Marine Sediments

GEO 567 Sedimentary Rocks and Crustal Evolution

GEO 570 Earthquake Mechanics

GEO 571 Mechanics of Geologic Materials

GEO 572 Advanced Seismology

Specialized, advanced seminars are offered periodically by various faculty members. These include the following courses:

GEO 603 Topics in Petrology

GEO 605 Topics in Sedimentary Geology-Paleontology

GEO 607 Topics in Geophysics

GEO 609 Topics in Mineralogy and Crystallography

B. Research Projects

Each student must complete two individual research projects with separate faculty members as part of the requirements leading up to the Ph.D. qualifying exam. One of these projects can be an M.S. thesis. The requirements for each of these papers are determined by the individual professors with whom the research is carried out. When working on such a project, students register for either GEO 590 or 599 Research, after consultation with the appropriate professor. A research paper or M.S. thesis completed before arriving at Stony Brook may substitute for one of the two research papers required before orals, if it is approved for that purpose by the graduate committee.

C. Ph.D. Preliminary Examination

The preliminary examination consists of the preparation and oral defense of a thesis proposal. There are three separate steps in this procedure: (1) submission of a proposal abstract to the graduate committee, who then selects an examining committee, (2) submission of the thesis proposal to the examining committee, and (3) oral defense of the proposal.

D. Thesis Proposal Abstract

A one-page document stating the most essential aspects of the student's proposed thesis, the thesis proposal abstract must be signed by three faculty members before being given to the

graduate committee. One of the three faculty members must be identified as a potential sponsor, meaning that he or she is tentatively willing to be the student's thesis advisor. This implies no commitment, either on the part of the professor or the student.

Upon receipt of the abstract, the graduate committee selects the members of the student's Ph.D. preliminary examination committee and sets a deadline (usually six weeks) for the submission of the thesis proposal to the examination committee. This committee is to consist of five scientists holding Ph.D. degrees who are experts in fields related to the proposal, at least four of whom must be members of the department.

E. Thesis Proposal

The Ph.D. thesis proposal specifies the scientific rationale for the proposed thesis work, the relevant work done thus far, and the techniques and effort required to reach the research objective. When the thesis proposal is completed, copies are given to each member of the examination committee. Within a week of receiving the proposal, the examination committee will meet to determine whether or not the thesis proposal is defensible. If it is not deemed defensible, the student is informed as to whether a resubmittal will be permitted. If the thesis proposal is deemed acceptable, the examination committee sets a date for the Ph.D. preliminary examination.

F. Oral Preliminary Examination

The student gives a short public presentation of the thesis proposal, after which there is a closed oral examination. Although much of the questioning inevitably focuses on the proposed thesis work, any topic in the geosciences and related fields may be covered in the questioning. At the end of the examination, the student and any others present who are not part of the preliminary examination committee are excused. The committee will then judge whether the student has demonstrated the ability to conceive, plan, and carry out original research.

The examination committee has a range of options open to it. It may vote to deny Ph.D. candidacy, either with or without a second opportunity to pass the Ph.D. preliminary examination. It may vote to accept the proposal, but fail the student on other grounds. In

doing so, the examination committee may either bar a second opportunity to take the exam, require specific remedial actions, or schedule a second opportunity to take the examination. The committee has the option to vote to reconvene in order to re-evaluate its decision, based upon actions the student has taken in response to the examination committee's recommendations.

The examination committee may also vote to pass the student contingent upon changes in or rewriting of the proposal. It is free to establish any mechanism it deems necessary to affirm whether or not its requirements have been met. All decisions must be agreed to by a majority vote and must be conveyed in writing to the graduate program director and to the student.

When the graduate program director has been informed by the chairperson of the examination committee that the student has passed the Ph.D. preliminary examination, the department recommends to the Graduate School that the student be advanced to Ph.D. candidacy.

G. Teaching Requirement

All graduate students must register for GEO 600, Practicum in Teaching, at least once, as outlined in Course Requirements on the preceding page.

H. Dissertation

The Ph.D. dissertation is the document summarizing the original scientific research in recognition of which the Ph.D. candidate seeks the doctoral degree. The University has very specific rules about the format of the thesis, but the nature of its scientific content is at the discretion of the student, his or her advisor(s), and the Ph.D. thesis defense committee. In many cases, the thesis consists of a linked set of published or soon-to-be-published scientific papers.

When informed by the student's advisor that the thesis is ready to be defended, the graduate committee selects a Ph.D. thesis defense committee. The defense committee consists of five or six members, a majority of whom must be members of the department. One defense committee member, other than the thesis advisor, is appointed as committee chairperson by the graduate committee. Within two weeks of receiving the thesis, the defense committee chairperson polls the committee members to ascertain

that the thesis is actually defensible. If it is, the defense committee chairperson formally schedules the oral defense.

I. Ph.D. Thesis Oral Defense

The student makes a public presentation of the major results of the thesis. There is then a closed session, during which the student is examined primarily, but not exclusively, on the dissertation topic. The committee has the option of voting to accept the thesis, reject it, or accept it with revisions. If the thesis is accepted with required revisions, the committee will decide the mechanism for determining compliance with its requirements. Voting is by majority.

Requirements for the M.S. Degree with Thesis in Geosciences

The M.S. in Geosciences with thesis is typically a nonterminal degree completed by some students before seeking Ph.D. candidacy. All requirements for the M.S. degree must be completed within a period of three years after entry. There are no residence or language requirements.

A. Course Requirements

Students must successfully complete a program of 30 graduate credits, including a minimum of 18 credits in approved academic courses. A student must achieve a 3.0 overall grade point average in all graduate courses taken at Stony Brook to receive a degree.

B. M.S. Thesis

An M.S. thesis proposal of no more than two pages must be submitted to the graduate committee at the end of the first year. The proposal must be signed by two faculty members, one of whom must be designated as a potential sponsor of the research and research advisor. After the proposal has been accepted, the student may proceed with the preparation of the M.S. thesis.

When the M.S. thesis is nearing completion, the student's advisor asks the graduate committee to appoint a defense committee. This committee consists of three experts in the field who hold Ph.D.s, at least two of whom must be members of the program faculty. Within two weeks of receiving the thesis, the defense committee decides whether the thesis is defensible. If it is, then an oral thesis defense is scheduled.

The M.S. thesis defense consists of a short public presentation of the major results of the thesis. This is followed by a closed examination that may cover any topic within the student's general field of study, but generally concentrates upon the thesis topic. The thesis defense committee may vote to accept the thesis, return it to the student for revisions, or reject it outright.

Requirements for the M.S. Degree with Concentration in Hydrogeology

The non-thesis M.S. with a concentration in Hydrogeology requires a total of 30 credits. Of these 30 credits, at least 21 credits must be in the required and approved courses and at least six credits must be in approved research. A minimum overall grade point average of B is required. Students are required to complete the four core courses in category A; one course from category B (if a student is deficient in either writing or communication skills, computer programming, or statistics); and one, two, or three courses from category C. There are no residence or language requirements.

Category A

GEO 515 Geohydrology

GEO 564/AMS 562 Numerical Hydrology

GEO 526 Low-Temperature Geochemistry

GEO 519 Geochemistry of Natural Waters

Category B

AMS 576 Statistical Methods for Social Scientists

EST 588 Technical Communication for Management and Engineering

Category C

GEO 573 Hydromechanical Behavior of Geomaterials

GEO 521 Isotope and Trace Element Geology

GEO 524/MAR 524 Organic Contaminant Hydrology

EST 593 Risk Assessment

EST 595 Principles of Environmental Systems Analysis

EST 596 Simulation Models for Environmental Waste Management

EST 597 Waste Management: Systems and Principles

CEY 503 Environmental Law

CEY 509 Man, Environment, and Health

Research

In addition to formal coursework, the curriculum for the M.S. with concentration in Hydrogeology includes a minimum of six credits of research, either GEO 590 or 599, after consultation with the appropriate professor. This research is to be carried out over a period of two or more semesters, and will be designed through a mutual consultation between the student and one or more members of the participating faculty. The purpose of the research is to give the student experience at solving hydrogeological problems. It may utilize field, laboratory, or theoretical approaches. The program of research will culminate in a written report to be approved by three designated faculty.

Requirements for the M.A.T. Degree in Earth Science

The Master of Arts in Teaching Earth Science leads to provisional certification for teaching earth science in secondary schools in New York State. It also prepares the student for the examination for permanent certification. There is no residence requirement. Students must complete at least one year of college-level study of a foreign language. Students in the M.A.T. program must register through the School of Professional Development.

A. Formal Coursework

Students are required to complete with an average grade of B or higher 15 credits in earth science courses and 27 credits in pedagogical courses and teaching experience. The departmental M.A.T. advisor, in consultation with the student, will determine a set of earth science courses for the M.A.T. degree in Earth Science.

B. Recommendation of the Department for the M.A.T.

When all program requirements are completed, the departmental M.A.T. advisor will consult with the director of the Science Education Program to determine whether all state-mandated

education courses have been completed. If they conclude that all requirements have been met, they will inform the associate dean of the School of Professional Development that the requirements for provisional certification have been fulfilled and recommend to the dean of the Graduate School that the M.A.T. degree should be granted.

C. Time Limit

Although full-time students can complete all requirements for the M.A.T. degree within three semesters, part-time students will require additional time to complete the degree requirements.

Courses

GEO 500 Geosciences Research Seminar

Meetings in which first-year graduate students and undergraduates with senior standing learn about the research activities of the Geosciences faculty.

Fall, S/U grading

GEO 502 GIS for Geologists

A practical introduction to geographic information system software. Participants learn to use direct measurement and mathematical techniques to compute the location of features and gain practical experience in rendering imagery and tabular geographic data as layers on maps. The course consists of two three-hour sessions per week for the first five weeks of semester, which include fieldwork, lectures, demonstrations and software-based analysis of data.

Fall, every year, 1 credit, ABCF grading

GEO 503 Mineral Equilibria

Covers the basics of the application of the principles of chemical thermodynamics to the resolution of geochemical and petrological problems. Begins with the first law and continues through phase transitions, properties of fluids, definitions of fugacity and activity of major and trace elements in fluids and molten solutions; configurational entropies; models quantifying nonideal mixing in solid solutions. Additional topics include interpretation of calorimetric studies and/or solubilities of minerals in aqueous solutions.

Prerequisites: Physical chemistry and thermodynamics or permission of instructor
Fall, alternate years, 3 credits, ABCF grading

GEO 505 Experimental Petrology Laboratory

The course is designed to give the student experience in some or all of the following techniques of experimental petrology: evacuated silica-glass tube experiments, one-atmosphere quenching experiments (with and without controlled atmospheres), 1- to 5-kbar hydrothermal systems (using oxygen buffers where necessary), gas-media experiments up to 7 kbar, and solid-media, piston-cylinder experiments.

Requirements: Completion of a project

involving several of the above techniques; written report

Prerequisite: Permission of instructor
Spring, alternate years, 1 credit,
ABCF grading

GEO 506 Theoretical Petrology

Theory of phase diagrams, Schreinemaker's rules, heterogeneous equilibria, experimental systems of petrologic interest, and properties of solutions.

Prerequisites: Metamorphic and igneous petrology and physical chemistry or thermodynamics, or permission of instructor
Spring, 3 credits, ABCF grading

GEO 507 Petrogenesis

Discussion of the origin and evolutionary history of selected types of igneous and metamorphic rocks by integrating the principles of heterogeneous phase equilibria, trace-element and isotopic geochemistry, crystal chemistry, and geologic occurrence.

Fall, 3 credits, ABCF grading

GEO 508 The Rock-Forming Minerals

Study of the crystal chemistry, intracrystalline cation distribution (homogeneous equilibria) stability, and paragenesis of the rock-forming minerals. Special emphasis is placed on amphiboles, feldspars, micas, and pyroxenes.

Fall, 3 credits, ABCF grading

GEO 511 Computer Programming for the Geosciences

An introduction to object-oriented programming in Java for geoscience students. Participants are required to develop interactive programs to serve as educational or research tools pertaining to topics within the geosciences. These programs, or applets, include a graphical user interface that enables users to control parameters and observe results. The applets are posted on the Web.

Prerequisite: Geosciences graduate standing
Spring, 3 credits, ABCF grading

GEO 514 Introduction to Physical Hydrogeology

Surface hydrology. Principles of groundwater flow. Well hydraulics. Geology of groundwater occurrence. Water quality and groundwater contamination. Hydrologic site evaluation.

Spring, 3 credits, ABCF grading

GEO 515 Geohydrology

Dynamics of fluids in porous media. Fundamentals of physical hydrogeology. Quantitative analysis of regional groundwater system and well hydraulics. Introduction to numerical simulation techniques. Hydrodynamic dispersion and basic concepts of contaminant transport.

Spring, 3 credits, ABCF grading

GEO 517 Crystal Chemistry

The structure/property/composition relationships in solids. An introduction to the common structure types and how they illustrate principles useful in understanding more complex solid-state materials. Applications of modern scattering techniques to the study of solids, particularly Earth materials, are also included.

Fall, 3 credits, ABCF grading

GEO 518 Carbonate Sediments

An intensive study of the formation, deposition, lithification, and diagenesis of carbonate sediments. Lectures and seminars emphasize principles of carbonate deposition, facies relationships, and chemistry. Laboratories emphasize binocular and petrographic analysis of recent and ancient carbonates.

Spring, alternate years, 4 credits,
ABCF grading

GEO 519 Geochemistry of Natural Waters

A comprehensive quantitative treatment of the processes controlling the chemistry of polluted and unpolluted surface and groundwaters. Topics covered include thermodynamics and kinetics of water-rock interaction; mineral solubility; chemical speciation; redox reactions; adsorptions; carbonate chemistry; and speciation, mobility, and toxicity of metal ions. Based on a knowledge of these processes, the chemical composition of a wide variety of surface and groundwaters is interpreted. Water-quality criteria and their application are also discussed.

Spring, 3 credits, ABCF grading

GEO 520 Glacial Geology

History of glaciation on earth, formation and dynamics of glaciers and ice sheets; processes of glacial erosion and deposition; and the nature of glacial sediments and landforms particularly relating to the development of Long Island.

Prerequisite: Physical Geology
Spring, 3 credits, ABCF grading

GEO 521 Isotope and Trace Element Geology

Application of radiogenic isotopes and trace elements to the petrogenesis of igneous, metamorphic, and sedimentary systems including water-rock interaction in diagenetic and hydrothermal systems. Evaluation of radiogenetic techniques for determining the ages of rocks and minerals.

Spring, alternate years, 3 credits,
ABCF grading

GEO 522 Planetary Sciences

The chemical, physical, and petrologic properties of meteorites are reviewed. These data and data for the moon and the terrestrial planets are used to form a picture of the origin, chemical evolution, and accretion of planetary material.

Fall, 3 credits, ABCF grading

GEO 524 Organic Contaminant Hydrology

There are a host of chemical, biological, and physical processes that affect the transport and fate of organic chemicals in natural waters. This course concerns understanding these processes and the structure-activity relationships available for predicting their rates. The major focus of this class is on contaminant hydrology of soil and aquifer environments, and includes the principles behind remediation and containment technologies. This course is offered as both MAR 524 and GEO 524.

Prerequisite: GEO 526 or MAR 503 or permission of instructor
Spring, 3 credits, ABCF grading

GEO 526 Low-Temperature Geochemistry

Fundamental principles of chemical thermodynamics and kinetics, including isotope effects, as they pertain to geochemical processes occurring in surface and near-surface environments. Consideration is also given to mass transfer process and reaction pathways.

Fall, 3 credits, ABCF grading

GEO 528 Carbonate Geochemistry

Examination of the mineralogical and chemical characteristics of the rock-forming carbonates with emphasis on stabilities in the geological environments. Includes study of phase relations; trace and minor element chemistries; and mechanisms of growth, dissolution, and replacement. Use of current research techniques as applied to carbonate minerals.

Fall, alternate years, 3 credits, ABCF grading

GEO 531 Crystalline Solids

Principles of symmetry, single-crystal, and powder X-ray diffraction techniques and elements of crystal structure determination are considered. Use of crystallographic data in the study of mineral systems. Laboratory in diffraction techniques includes extensive use of digital computers.

Fall, alternate years, 3 credits, ABCF grading

GEO 532 Solid-State Geochemistry

The application of crystallographic techniques to problems in mineral chemistry. Concepts of the crystalline state, order-disorder, atom radii, chemical bonding, atom coordination, solid solutions, and physical properties of minerals. Emphasis on silicate and sulfide crystal structures.

Fall, alternate years, 3 credits, ABCF grading

GEO 533 Geochemistry of the Solid Earth

A brief overview of basic principles of geochemistry, including origin of the elements, geochemical and cosmochemical classification of the elements, and a geochemical perspective of the periodic table. This is followed by an examination of the compositions and chemical interactions among the major geochemical reservoirs of the solid earth, including core, upper and lower mantles, oceanic and continental crust, and the sedimentary shell of the Earth.

Prerequisite: Graduate standing or permission of instructor
Spring, even years, 3 credits, ABCF grading

GEO 535 Regional Structure and Tectonics

Formation and development of continental crust in Phanerozoic mountain belts. The structure and origin of ocean crust, magmatic arcs, and continental margin sequences are studied using geophysical, geochemical, and geologic data from ancient and modern examples.

Fall, alternate years, 3 credits, ABCF grading

GEO 540 Solid Earth Geophysics

An overview of solid earth geophysics. Topics include earthquake and exploratory seismology, gravity, magnetics, geochronology, and heat flow. There is an emphasis on how all of these techniques shed light on the nature of the Earth's interior and dynamics.

Prerequisite: Physical geology, undergraduate physics and calculus
Fall, 3 credits, ABCF grading

GEO 542 Inverse Theory

Introduction to the basic concepts of inverse theory and its application to the study of the internal structure of the Earth and related problems.

Fall, alternate years, 3 credits, ABCF grading

GEO 543 Stratigraphy

The history and practice of defining units layered rocks and interpreting their spatial relationships. Topics include the basis for the geologic time scale, lithostratigraphic versus chronostratigraphic units, biostratigraphy, magnetostratigraphy, facies patterns and Walther's law, subsurface stratigraphy, and the application of stratigraphy to geological problems. One three-hour laboratory per week. Laboratory work emphasizes practical techniques in stratigraphy.

Prerequisite: GEO 546 or undergraduate mineralogy and petrology

Fall, 4 credits, ABCF grading

GEO 546 Mineralogy and Petrology

An introduction to mineralogy and petrology, including crystallography, crystal chemistry, mineral identification, and the processes that govern the formation of igneous and metamorphic rocks. Two three-hour laboratories per week.

Prerequisite: Undergraduate physical geology and one year of undergraduate chemistry
Spring, 4 credits, ABCF grading

GEO 549 Structural Geology

Principles of structural geology, including the recognition and the mechanics crustal structural features. Topics include folding and faulting, stress and strain, and the nature of brittle and ductile lineations and foliations in the crust. One three-hour laboratory per week.

Prerequisite: Undergraduate physical geology
Spring, 4 credits, ABCF grading

GEO 550 Global Tectonics

Geological, geochemical, and geophysical evidence related to the concepts of plate tectonics and mantle convection. Kinematics and dynamics of plate motions. Origin of first-order crustal structures of continents and ocean basins. Geochemical and thermal evolution of the Earth.

Spring, 3 credits, ABCF grading

GEO 551 Physics of the Earth I

Study of the internal structure and properties of the Earth as revealed by field and laboratory investigations. Topics include the rotation and figure of the Earth, gravity anomalies, solid-earth tides, geomagnetism and paleomagnetism, electromagnetic induction, and heat flow and the Earth's present and past thermal states. May be taken independently of GEO 552.

Fall, 3 credits, ABCF grading

GEO 552 Physics of the Earth II

Study of the Earth's structure and properties based on evidence from seismology and high-pressure geophysics. Topics include fundamental principles of elastic wave theory, body and surface wave propagation in layered media, earthquake source mechanisms, free oscillations of the Earth, and rheological

properties of the Earth's interior. May be taken independently of GEO 551.

Fall, alternate years, 3 credits, ABCF grading

GEO 556 Solid-State Geophysics

Application of lattice dynamics and equations of state of solids to studies in high-pressure, high-temperature geophysics. Reviews experimental data from physical acoustics, static and shock wave compression, and theoretical results from finite strain and atomistic models.

Prerequisites: GEO 551 and 552 or permission of instructor

Spring, 3 credits, ABCF grading

GEO 562 Early Diagenesis of Marine Sediments

The course treats qualitative and quantitative aspects of the early diagenesis of sediments. Topics include diffusion and adsorption of dissolved species; organic matter decomposition and storage; and diagenesis of clay materials, sulfur compounds, and calcium carbonates. The effects of bioturbation on sediment diagenesis are also discussed. This course is offered as both MAR 562 and GEO 562.

Prerequisite: Permission of instructor

Fall, alternate years, 3 credits, ABCF grading

GEO 564 Numerical Hydrology

Numerical solution methods for the equations of incompressible flow in porous media with special emphasis on groundwater flow. Finite difference and finite element methods for steady-state and transient flows-boundary conditions, range of validity and stability of the numerical schemes, and numerical artifacts. The approach is hands on, with example problems being computed. This course is offered as both GEO 564 and AMS 562.

Prerequisite: AMS 526 or permission of instructor

Fall, alternate years, 3 credits, ABCF grading

GEO 567 Sedimentary Rocks and Crustal Evolution

An examination of major and trace elements and isotopic composition of terrigenous sedimentary rocks within a framework of tracing the composition and evolution of the continental crust. Emphasis is placed on interpreting sedimentary compositions in terms of provenance and sedimentary history (e.g., weathering, diagenesis, recycling). Relationships between sediment composition and tectonic setting is also examined.

Spring, 3 credits, ABCF grading

GEO 570 Earthquake Mechanics

A survey of fundamental mechanics aspects of earthquake rupture; reviews concepts of fracture mechanics, elastodynamics, and experimental rock mechanics. Topics include state of stress in the lithosphere, theoretical models of earthquake instability, energetics of faulting, representation of dynamic elastic field generated by earthquakes, and relation of seismic signals to the kinematics and dynamics of seismic source.

Prerequisite: GEO 552 or permission of instructor

Spring, alternate years, 3 credits, ABCF grading

GEO 571 Mechanics of Geologic Materials

Elastic, thermal, and anelastic properties of geological materials. The course emphasizes a thermodynamic characterization of these properties including irreversible thermodynamics and nonhydrostatic thermodynamics. Specific applications to the Earth's environment are discussed.

Prerequisites: GEO 551, 552, or permission of instructor

Fall, alternate years, 3 credits, ABCF grading

GEO 572 Advanced Seismology

Course is intended to expose the student to topics that are at the forefront of current seismological research. Examples include wave propagation in heterogeneous media, earthquake source studies, tsunami generation, and seismic network data analysis.

Prerequisite: GEO 552

Fall, alternate years, 3 credits, ABCF grading

GEO 573 Hydromechanical Behavior of Geomaterials

Fundamentals of the hydromechanical behavior of soil and rock in relation to hydrogeology and geotechnical engineering. Topics include hydraulic permeability and storage capacity of soil and rock; structure and fabric of soil; soil elasticity and plasticity; consolidation, subsidence, and slope stability; rock fracture mechanics; hydraulic and contaminant transport in fractured media.

Prerequisites: GEO 309 and GEO 515, or permission of instructor

Fall, alternate years, 3 credits, ABCF grading

GEO 581 Coastal Engineering Geology

Concepts of the mechanics of earth materials and the physics of surficial processes with applications to the coastal environment and engineering. This course is also offered as MAR 581.

Prerequisites: Enrollment in MESP or OEN program, or permission of instructor

Fall, 3 credits, ABCF grading

GEO 585 Directed Studies

Special studies directed by various faculty members.

Fall, spring, and summer, 1-3 credits, ABCF grading

GEO 588 Geological Field Methods for Earth Science Teachers

Geologic mapping techniques, geochemical analytical approach, and hydrological methodologies applied in the field to examples on Long Island. These approaches are designed for developing research projects for secondary students in earth science.

Prerequisite: Permission of instructor
Summer, 3 credits, ABCF grading

GEO 589 Research for Earth Science Teachers

This course is intended to provide earth science teachers or students in the M.A.T. in Earth Science program an opportunity to obtain research experience. A written report is required.

Prerequisite: Permission of instructor
Summer, 1-3 credits, ABCF grading

GEO 590 Research Project

Independent research
 Fall, spring, and summer, 1-12 credits,
 ABCF grading
 May be repeated for credit

GEO 599 Research

Independent research for those students
 established in a research group.
 1-12 credits, S/U grading
 May be repeated for credit

GEO 600 Practicum in Teaching

Fall and spring, 0-3 credits, S/U grading
 May be repeated for credit

GEO 603 Topics in Petrology

Fall and spring, 1-3 credits, ABCF grading
 May be repeated for credit

**GEO 605 Topics in Sedimentary Geology--
Paleontology**

Fall and spring, 1-3 credits, ABCF grading
 May be repeated for credit

GEO 607 Topics in Geophysics

Fall and spring, 1-3 credits, ABCF grading
 May be repeated for credit

**GEO 609 Topics in Mineralogy and
Crystallography**

Fall and spring, 1-3 credits, ABCF grading
 May be repeated for credit

GEO 696 Geoscience Colloquium

A weekly series of research seminars pre-
 sented by visiting scientists as well as by the
 faculty. Required every semester of all geo-
 science graduate students.
 Fall and spring, S/U grading
 May be repeated for credit

GEO 697 Geoscience Seminar

Presentation of preliminary research results
 and current research problems by students
 and faculty. Required every semester of all
 geoscience graduate students.
 Fall and spring, S/U grading
 May be repeated for credit

GEO 698 Geoscience Special Seminar

A weekly series of specialized seminars in
 which graduate students and faculty discuss
 specific topics within the subgroups of geology.
 Research is reviewed, these are discussed.
 Fall and spring, S/U grading
 May be repeated for credit

GEO 699 Dissertation Research on Campus

Independent research for Ph.D. degree. Open
 only to candidates for the Ph.D. who have
 passed the preliminary examination.
*Prerequisite: Advancement to candidacy
 (G5); major portion of research must take
 place on SBU campus, at Cold Spring
 Harbor, or at Brookhaven National Lab*
 Fall, spring, and summer, 1-9 credits,
 S/U grading
 May be repeated for credit

**GEO 700 Dissertation Research off Campus--
Domestic**

*Prerequisite: Must be advanced to candi-
 dacy (G5); major portion of research will
 take place off campus, but in the U.S. and/or
 U.S. provinces (Brookhaven National Lab
 and Cold Spring Harbor Lab are considered
 on campus); all international students must
 enroll in one of the graduate student insur-
 ance plans and should be advised by an
 International Advisor*
 Fall, spring, and summer, 1-9 credits,
 S/U grading
 May be repeated for credit

**GEO 701 Dissertation Research off Campus--
International**

*Prerequisite: Must be advanced to candidacy
 (G5); major portion of research will take
 place outside the U.S. and/or U.S. provinces;
 domestic students have the option of
 the health plan and may also enroll in
 MEDEX; international students who are
 in their home country are not covered by
 mandatory health plan and must contact
 the Insurance Office for the insurance
 charge to be removed; international students
 who are not in their home country are
 charged for the mandatory health insurance
 (if they are to be covered by another insur-
 ance plan, they must file a waiver by the
 second week of classes; the charge will only
 be removed if the other plan is deemed com-
 parable); all international students must
 receive clearance from an International
 Advisor*
 Fall, spring, and summer, 1-9 credits,
 S/U grading
 May be repeated for credit

GEO 800 Summer Research

May be repeated for credit

School of Health Technology and Management

Dean: Craig A. Lehmann, Health Sciences Center Level 2, Room 400 (631) 444-2251

Associate Dean: Deborah T. Firestone

Associate Dean for Graduate Studies: Richard Johnson

Assistant Deans: Eleanor Kra, Administration; Karen Joskow Mendelsohn, Academic Affairs

American demographics, economics, and technological advances in diagnostics, treatment, and therapy have combined to create an environment in the 21st century in which patients are diagnosed earlier; are more likely to survive disease or trauma; live longer; participate in ambulatory-based treatment; and assume a more participatory role in their own health care. The School of Health Technology and Management is dedicated to provide students with the necessary knowledge and skills to practice their profession and competently meet the diverse and complex needs of individuals within a variety of health care settings.

The School offers baccalaureate, master's, and doctoral degrees in clinical and non-clinical areas that include clinical laboratory sciences, cytotechnology, health science, occupational therapy, physician assistant, physical therapy, respiratory care, athletic training, and health care policy and management.

Health care is ever changing and the School is constantly reviewing and expanding program offerings in order to meet the demands of the population and health care market. The School's primary focus is to educate the future workforce of New York State and the region, as well as develop national and international leaders in health care.

Additional program and admissions information can be found in the Health Sciences Center Bulletin and online at www.hsc.stonybrook.edu/sohtm.

Graduate programs in the School of Health Technology and Management:

Health Care Policy and Management Program (MS)

Department Chair, Alan Leiken, Health Sciences Center, Level 2, Room 418, (631) 444-3243

Program Director, Nanci Rice, Health Sciences Center, Level 2, Room 417, (631) 444-3198

Advanced Certificate Program in Health Care Management

Program Director: Alan Leiken

Occupational Therapy Program (BS/MS)

Program Director, Donna Costa, Health Sciences Center, Level 2, Room 438, (631) 444-8126

Physical Therapy Program (DPT)

Department Chair, Richard Johnson, Health Sciences Center, Level 2, Room 419, (631) 444-3250

Physician Assistant Program (MS)

Department Chair, Paul Lombardo, Health Sciences Center, Level 2, Room 424, (631) 444-3191

Hispanic Languages and Literature (SPN)

Acting Chairperson: Román de la Campa, Frank Melville Jr. Memorial Library N3015 (631) 632-6935/9668

Graduate Program Director: Lou Charnon-Deutsch, Frank Melville Jr. Memorial Library N3018 (631) 632-6031

Graduate Secretary: Sarah Battaglia, Frank Melville Jr. Memorial Library N3017 (631) 632-6935

Degrees awarded: M.A. in Hispanic Languages and Literature; M.A. in Teaching Spanish; M.A. in Romance Languages and Literature (Spanish); Ph.D. in Hispanic Languages and Literature

The Department of Hispanic Languages and Literature, in the College of Arts and Sciences, offers different curricula leading to the degrees of Doctor of Philosophy and Master of Arts. A candidate for the Ph.D. degree engages in research leading to a dissertation. The M.A. degree may emphasize either literary research or language teaching. Part-time study is permitted with graduate courses usually offered during the late afternoon.

Admission Requirements

Besides filing the official graduate application forms, the prospective student must provide transcripts covering all previous college-level studies. This usually includes a bachelor's degree with a major in Spanish, three letters of reference, and a sample of written work (an essay or term paper). GRE scores, while not required, are taken into consideration. The department urges students to take it, but students with strong academic records who do not will be considered for admission.

International applicants must score at least 550 on the Test of English as a Foreign Language (TOEFL) and must show that they have the necessary funds to finance their education (living expenses plus tuition). It is strongly recommended that applicants take the TOEFL exam in their country of origin. An applicant whose qualifications seem deficient may be admitted on a part-time basis as a Graduate School special student (GSP) through the School of Professional Development.

All students who do not speak English as a native language, any new or transfer Ph.D. students, supported master's students, and students for whom the TOEFL has been waived as a requirement for admissions must take the English proficiency exam or SPEAK (Speaking Proficiency English Assessment Kit) test. SPEAK scores lower than 55 may require a student to take an ESL class(es) or be ineligible to teach. A recent TSE or IELTS exam can be substituted for the SPEAK test. The ESL Program from the Linguistics

Department gives this exam, which is administered by appointment only. Students must score at least 55 points or higher to satisfy Stony Brook's English proficiency requirements.

Teaching Assistantships (TAs)

The Department of Hispanic Languages and Literature has a yearly allocation of teaching assistantships for its graduate students. Each year, the assistantships are awarded to the most promising applicants.

Teaching assistants are assigned to teach one section of a course each semester. During the first semester of their assistantship, they are required to attend an orientation session and a practicum given by the department in order to provide instruction in the methodology of language teaching. In the performance of their teaching duties, teaching assistants must conform to the program and University regulations regarding examinations, class attendance, textbooks, office hours, grading systems, and syllabi.

Meetings with a supervisor and a coordinator of language courses are regularly scheduled and attendance is mandatory. Written evaluations of each TA's teaching performance are done periodically by the department. Renewal of assistantships will depend upon compliance with the regulations listed above.

Teaching assistantships are renewable for a maximum of three years for Ph.D. students entering with an M.A. or equivalent, or four years for Ph.D. students entering with a B.A. or equivalent. Students who are ABD (all but dissertation) may be eligible for a fifth year in certain circumstances. Renewal is subject to passing the qualifying examination and satisfactory course grades and teaching. There is a limited opportunity for summer teaching at an appropriate stipend. Other fellowships, loans, and work-study programs are available.

Several W. Burghardt Turner fellowships are awarded each year to promising minority students who hold American citizenship.

Faculty

Professors

Charnon-Deutsch, Lou^{1,3,4}, *Acting Chairperson*. Ph.D., 1978, University of Chicago: 18th- and 19th-century Peninsular literature; feminist theory; women writers.

De la Campa, Román^{1,2,3}, Ph.D., 1976, University of Minnesota: Latin American and Caribbean literature; contemporary critical theory.

Read, Malcolm K., Ph.D., 1978, University of Wales: Sociology of literature; literary theory; Marxism and psychoanalysis.

Roncero-López, Victoriano, Ph.D., 1988, University of Illinois, Champaign; 1987, Universidad Complutense de Madrid: 15th- to 17th-century literature of Spain; historiography; European humanism; modern theory.

Lastra, Pedro, *Emeritus*. Ph.D., 1967, Universidad de Chile: Modern and contemporary Spanish-American literature.

Vasvari, Louise¹, *Emeritus*. Ph.D., 1969, University of California, Berkeley: Medieval literature; translation theory; literature and linguistics; romance philology.

Associate Professors

Klein-Andreu, Flora, *Emeritus*. Ph.D., 1972, Columbia University: Linguistic meaning; language evolution and variation; relation between theory and research methods.

McKenna, James B., *Emeritus*. Ph.D., 1965, Harvard University: 20th-century Hispanic culture and literature.

Vera-León, Antonio, Ph.D., 1987, Princeton University: 19th- and 20th-century Latin American and Caribbean literature.

Vernon, Kathleen M.⁴, Ph.D., 1982, University of Chicago: 20th-century Hispanic cinema and culture.

Assistant Professors

Elías-Ulloa, José, Ph.D., 2005, Rutgers University: Phonology and contact of indigenous languages and Latin American Spanish.

Flesler, Daniela, Ph.D., 2001, Tulane University: Contemporary Spanish literature; postcolonial theory; cultural studies.

Ordoñez, Francisco, Ph.D., 1997, Graduate Center, CUNY: Syntax; morphology; dialectology.

Polit-Dueñas, Gabriela, Ph.D., 2002, New York University: Contemporary Latin American literature; gender and critical theories.

Visiting Assistant Professor

Pérez-Melgosa, Adrián³, Ph.D., 1995, University of Rochester: Film and literature in the Americas; cultural studies; film studies.

Director of the Spanish Language Program

Ruiz-Debbe, Lilia, Ph.D., 1997, University of Geneva, Switzerland: Applied linguistics; second language research; language pedagogy.

Lecturers

Rzhevsky, Tatiana G., M.A., 1981, University of Illinois: Spanish language and literature; foreign language pedagogy.

Segura, Eduardo, M.A., 1997, Stony Brook University: Hispanic languages and literature.

Number of teaching, graduate, and research assistants, fall 2005: 19

1) Recipient of the State University Chancellor's Award for Excellence in Teaching

2) Recipient of the State University Chancellor's Award for Excellence in Research

3) Comparative Literature

4) Women's Studies

5) Language Learning and Research Center

Degree Requirements

Before registering for each semester, students should consult with a member of the graduate committee of their program to schedule an approved combination of courses. All new M.A. or Ph.D. students are required to meet with the graduate program director during the first week of classes in order to fill out information sheets. Normally, for the M.A., three or four semesters of full-time study are required. For the Ph.D., the number of semesters necessary before advancement to candidacy varies (see below). A minimum of two consecutive semesters of full-time graduate study in residence is required for the Ph.D. It is recommended that the number of Independent Studies not exceed two. However, this is determined on an individual level.

Undergraduate courses may also be considered as part of a full-time course load, but do not count toward a graduate degree. Since undergraduate courses are not covered by a tuition waiver, students must pay for such courses. Graduate reading proficiency courses (FRN 500, ITL 500, POR 500) fulfill the language requirement and count toward a full-time course load but not toward a graduate degree. According to University requirements, a minimum of a B average must be maintained in all graduate coursework. After taking the practicum (SPN 691),

students may choose to enroll in SPN 693 as part of a required 12-credit load until they reach the point where their full-time credit load is nine credits. Equivalent courses taken at other universities may be certified as fulfilling specific required courses in this department, but only six graduate course credits of any kind may be transferred.

M.A. in Hispanic Languages and Literature

The curriculum leading to the Master of Arts degree may be terminal or may be combined with Doctor of Philosophy program. In addition to proficiency in Spanish and English, reading knowledge in a third language is required. There is a general requirement of 36 graduate credit hours. At least 30 of these credits must consist of the following courses: (1) a minimum of one course in linguistics, (2) SPN 691, Practicum in the Teaching of Spanish Language, (3) SPN 509, Literary Theory (or another theory course), (4) a minimum of two courses in Peninsular literature at the 500 level, and (5) a minimum of two courses in Latin American literature at the 500 level.

After completion of 30 graduate credit hours, a student must either take a basic comprehensive examination or complete a thesis/project. Each of these options is equivalent to six graduate credit hours. Students working on a part-time basis should complete all requirements within five years after their first regular graduate registration.

The M.A. comprehensive examination is based on a reading list consisting of 75 titles: 50 in the field of major emphasis (Spanish Peninsular or Spanish-American) and 25 in the minor field. The student, with the advice of the graduate program director, will choose three members of the graduate faculty to form the examining committee, with one of them to act as chairperson. The examination consists of five hours of written work: three on the field of major emphasis and two on the minor field.

The M.A. thesis is written under the supervision of a member of the graduate faculty with the advice of a second reader.

The M.A. thesis does not require an oral defense. The recommended length for an M.A. thesis is between 70 and 100 pages, including notes and bibliog-

raphy. Regulations regarding the writing of the M.A. thesis are the same as those applicable to the Ph.D. dissertation. These regulations are contained in the book *Guide to the Preparation of Theses and Dissertations*, available on the Graduate School Web site.

M.A. in Hispanic Languages and Literature with a Concentration in Hispanic Linguistics

Students must complete 36 credits, consisting of (1) at least 30 credits of coursework (see list of required courses); (2) a comprehensive examination (three credits); and (3) either a research project and report (three credits) or an additional three credits of coursework. Students must demonstrate proficiency in English, Spanish, and another language and must achieve a grade point average of B or higher in all graduate courses taken. The student's program must be arranged in consultation with the advisor in Hispanic linguistics.

Required Courses

- A. LIN 530 Introduction to Linguistics
LIN 522 Phonetics
LIN 521 Syntax or LIN 527 Structure of English
An additional course in linguistics
- B. SPN 583 Contrastive Phonology
SPN 503 Semantics of Spanish Grammar or SPN 504 Contrastive Analysis
SPN 501 History of the Spanish Language
SPN 505 Spanish Dialectology and Sociolinguistics
- C. SPN 512 Medieval Spanish Literature

M.A. in Romance Languages

The M.A. in Romance Languages is offered for students who wish to follow a traditional M.A. Program with the intention of possibly proceeding toward further study on the Ph.D. level. Its flexibility allows students to design a curriculum that includes studies in literature, linguistics, or cultural studies in a combination of two Romance languages. This M.A. gives the students a choice of writing a Master's Thesis or passing a Comprehensive Examination to qualify for the degree. For further information contact the Department of European Languages.

M.A. in Teaching Spanish

The Master of Arts in Teaching Spanish is offered in conjunction with the School of Professional Development (SPD) and the Professional Education Program (PEP). This degree is designed as a course of study leading to New York State certification for teaching Spanish in secondary schools, grades 7-12. The M.A.T. normally entails a minimum of three semesters of study including courses on literature, linguistics and culture, professional education courses, and a supervised student teaching experience. In order to be eligible for admission to the M.A.T. in Spanish program, students must have completed an academic major in Spanish or its equivalent with a minimum cumulative GPA of 3.0 overall in a bachelor's degree program.

The program consists of 44 required credits of coursework: a minimum of 29 credits of education coursework and 15 credits in the Spanish content area. Teacher candidates are also required to participate in 100 hours of field experience prior to their student teaching placement. A full description of the education courses and field experience may be found in this bulletin under the School of Professional Development.

Students select their five Spanish content area courses in consultation with the Graduate Director. Upon approval of the Graduate Director, additional courses may become part of the students content area but those listed below are the most suitable for the M.A.T. program:

- SPN 501 Spanish Historical Linguistics
- SPN 502 Methods in Linguistics Research
- SPN 503 Spanish Linguistics
- SPN 504 Contrastive Analysis
- SPN 505 Spanish Dialectology and Sociolinguistics
- SPN 510 Hispanic Culture (a repeatable topics course)
- SPN 515 Spanish composition and stylistics
- SPN other 500-level courses in literature (in consultation with the Graduate Director)
- SPN 691 Practicum in Teaching Spanish

Doctor of Philosophy

The Ph.D. degree is the highest teaching and research degree offered by the University. The Ph.D. prepares the recipient for an academic career at the level of the four-year college and/or research university, or for other careers in humanistic study, research, and writing. The entering graduate student who is considering working toward a Ph.D. should immediately consult with the graduate director to plan a broad program of reading and coursework in all areas offered by the department.

The total number of required credits for the Ph.D. degree is usually 48 (16 courses). These 16 courses include the 12 general requirements specified below and four courses of the student's choosing. Each student is also required to take at least one graduate-level course outside of the department (this course may, upon consultation with the graduate program director, be used to satisfy one of the general requirements). While this sets a general standard for Ph.D. coursework, each student's actual plan of study will continue to be developed on an individual basis. The exact number and type of required courses will be determined based on the student's transcript and performance during his or her first semester(s) at Stony Brook. For example, exemptions from particular subareas may be granted depending on the student's prior study, while in cases of less-than-adequate preparation in any period of Peninsular or Latin American literature (which will vary in the cases of students coming from Spanish, Latin American, or North American universities) the student will be required to take additional coursework.

Required Courses

- A. Linguistics/Pedagogy (a minimum of two courses)
 - Applied Linguistics
 - History of the Spanish Language
 - Translation
 - Practicum
- B. Theory/Applied Theory (a minimum of three courses)
 - SPN 509 Literary Theory
 - Applied Theory (two courses)

Note: Courses qualify as applied theory if approximately 50 percent of the course material is drawn from critical and/or theoretical texts.

- C. General Literary Corpus (6 courses)

Note: A minimum of one course from each subarea to be tested in the comprehensive examination. Courses from area B (above) may be included, depending on content, but no one course may be used to satisfy both requirements B and C.

- D. Special Field (2 seminars)
 - These courses may be taken as independent studies, but generally only after the student has fulfilled requirements A, B, and C. The goal of these courses is to prepare papers for presentation and publication that may also serve as the basis for part of the thesis.

Sample of a four-year study plan for the Ph.D.:

- 1st year: Fall, 12 credits (including SPN 691)
Spring, 12 credits (including SPN 693)
- 2nd year: Fall, 9 credits
Spring, 9 credits
- 3rd year: Fall, 6 credits
Spring, comprehensive exam
- 4th year: Fall and Spring, thesis

Language Requirements

In addition to proficiency in Spanish and English, the Ph.D. student must demonstrate a reading knowledge of two languages among French, Latin, Portuguese, Italian, German, Catalán, Basque, and another language if related to the field chosen for the dissertation. The student is urged to demonstrate a reading knowledge of this language by the beginning of his or her second year of full-time study; he or she is required to fulfill both language requirements prior to being advanced to candidacy. A language requirement may be fulfilled by (1) passing the Princeton Graduate School Foreign Language Test (GSFLT), (2) successful completion (grade of B or higher) of a graduate reading course or regular graduate course in the foreign language, or (3) passing a special reading examination administered under the supervision of the Department of Hispanic Languages and Literature. If option three is chosen, the student should consult

with the graduate program director, who, along with the department chairperson, will designate an appropriate examiner. Texts will be assigned for the examination, during which a dictionary may be used for the translation of sight passages.

Qualifying Examination

The qualifying examination is an instrument designed to give the entire faculty of the department an opportunity to evaluate the student's academic abilities and promise. The exam seeks to assess the student's sensitivity to literature, capacity to deal critically with the text, and ability to express him- or herself cogently. Elaborate bibliographical information regarding the texts, while not discouraged, is not required.

The qualifying examination is only offered once a year, at the beginning of the fall semester. Students who wish to be confirmed as Ph.D. students must take and pass the qualifying examination (1) at the beginning of their third semester if they enter the program with a B.A. or M.A. in Spanish in the fall; (2) at the beginning of their fourth semester if they enter with a B.A. in the spring; (3) at the beginning of their second semester if they enter with an M.A. or its equivalent in the spring.

The department selects six texts and submits the list to the student not later than four months before the exam. It consists of (1) six hours of written work; the student answers four of six questions, omitting the one that he or she has selected for the oral presentation; each response is expected to be a minimum of four typed, double spaced pages; at least two of the responses must be written in Spanish; and (2) an oral presentation of some 20 minutes on the selected text; notes may be used, but the student should not read from a text. The oral presentation must be given in Spanish. Following the presentation, the faculty will ask questions.

Students who pass the qualifying exam are automatically admitted to the Ph.D. program. Students who do not pass the exam will be allowed to finish their master's degree but will not be permitted to advance to the Ph.D. program. Students are informed of the results of the exam only after all students have finished the oral portion of the exam. Traditionally,

the chairperson or the graduate program director informs students privately about the exam results, and later meets with each student in order to discuss the results.

Procedure for Renewing Teaching Assistantships

All teaching assistants (M.A., Ph.D.) are evaluated by the department as a whole to determine whether their teaching assistantships will be continued during the second year. This evaluation will be conducted according to the following criteria, which include but go beyond the strict grade point average: (1) previous intellectual experience, both general and in the area of Hispanism: breadth of courses taken in related fields, and other features that can help to determine the quality of each student. If the recent experience (i.e., the work done while at Stony Brook) is significantly better or worse than the student's previous experience, this shall be taken into consideration; (2) serious research capacity of each student as demonstrated by papers written for courses; (3) theoretical capacity of each student, as demonstrated by papers written for courses; (4) writing and speaking ability in the Spanish language; and (5) quality of each student as a teaching assistant.

The graduate committee receives evaluations from each faculty member who has worked with the student. The committee may also reread term papers written for courses. Students holding Incompletes will inevitably find themselves at a disadvantage in the process of evaluation.

Third-year support for all students will be automatic provided that students remain in good academic standing and have received adequate written reviews of their teaching.

Comprehensive Examination

The student, with the advice of the graduate program director, will choose five members of the Hispanic department faculty, one of whom will act as chairperson of the committee for his or her comprehensive examination. The comprehensive examination is an oral exam based on a list of texts chosen by the student in conjunction with all members of his or her committee who must formally approve the lists. The total (minimum) number of texts for the exam will be 60. The Spanish

portion will include six books in each of four categories and a minimum of six theoretical texts; the Latin American section will include eight books in each of three categories and a minimum of six theoretical texts. In selecting the lists, students should strive for balance among genres. After obtaining the written approval of each member of his or her exam committee, the student will submit his or her list to the graduate director, who will then approve the list or suggest modifications if necessary. This process must be completed one month before the proposed date for the exam.

Categories for Comprehensive Exam

- I. Peninsular
 - a. Medieval to Early Renaissance
 - b. Renaissance and Baroque
 - c. 18th and 19th centuries (up to the Generation of '98)
 - d. 20th and 21st centuries
- II. Latin America
 - a. Colonial
 - b. 19th Century and Modernism
 - c. Contemporary

The oral comprehensive exam will last a total of three hours, with approximately an hour and a half devoted to each section with a brief break between the two sections. The exam will be conducted in Spanish or English. Upon satisfactory completion of both sections of the exam, the student will be granted ABD status.

Dissertation Proposal

During the comprehensive exam, students will be expected to announce the topic of their dissertation and their dissertation advisor. The dissertation proposal will be presented to each member of the dissertation committee within three months following successful completion of the comprehensive exam. The proposal should be composed of three parts: (1) an introduction and description of the project consisting of approximately 10 to 20 pages; (2) a table of contents listing proposed chapters; and (3) a detailed bibliography of primary and critical sources. A copy of the proposal containing the signatures of the dissertation committee should also be forwarded to the graduate director.

Dissertation Committee

The student forms a dissertation committee with the advice of the graduate program director. This committee reviews the prospectus, the open draft, and the final draft of the dissertation. There will normally be five members: a dissertation director, who will be the first reader; a second reader; and three others (one of whom must be from outside the department). The dissertation director and student will arrange a date and a time for the defense with the committee and will take care of all necessary paperwork. A faculty member other than the dissertation director will preside as chairperson at the oral defense.

Dissertation

The initial draft of the dissertation is given first to the director of the dissertation (or the director and codirector as the case may be). After the approval of the director(s), each member of the dissertation committee should be provided with his or her own corrected draft of the dissertation and given at least one month to read it and make comments. The length of the dissertation should be a minimum of 225 pages, including notes and bibliography.

When the dissertation is nearing completion, the director of the dissertation and the student will jointly agree on a date for the defense. The candidate and/or the director will inform in writing the members of the defense committee, the graduate program director, and the graduate secretary of the defense date. Candidates should be aware that the department will not ordinarily reimburse outside readers for their travel to the defense or the cost of postage and other expenses related to the defense. In cases where the outside reader cannot attend the defense, arrangements must be made for the reader to submit questions or comments to be read in absentia.

The defense will consist of two parts. The first part, lasting normally about 30 minutes, consists of an oral presentation of the dissertation. The public is welcome to this portion of the defense. Following the presentation, each member of the examining committee will have an opportunity to ask questions and make final suggestions regarding the dissertation. The candidate shall bring a final draft of the dissertation to the defense, not the final copy to be carried subsequently to the Graduate

School, in case the committee suggests last minute changes. The candidate should also bring a rough draft of the dissertation abstract to the defense, which has been previously approved by the graduate director and submitted to the Graduate School. The abstract is to be written in English and should not exceed 350 words. The abstract should consist of a short statement of the student's research, a brief exposition of the methods and procedures employed in gathering data, and a condensed summary of the dissertation's conclusion.

Following the dissertation period, the candidate and any others not on the dissertation committee will be asked to leave the room while deliberations are made. If all members agree to accept the dissertation, they will sign the final version of the sign-off sheet or signature sheet, which the candidate will bring to the defense (together with the appropriate pen, which must use black permanent ink). This document must also be shown to the graduate secretary of the department so that the "Clearance for Graduation" form may be typed and forwarded to the Graduate School.

All members of the department, including graduate students, should be notified at least three weeks prior to the date and time of the public defense.

Courses

Spanish Courses

Courses described as repetitive are topic courses that may be taken an indefinite number of times as long as the topic varies. Other courses may not be repeated.

SPN 500 Reading Spanish

Through an intensive study of language structures and idiomatic usage, with extensive practice in written translation of literary and scholarly texts, candidates for advanced degrees are able to obtain the proficiency level of the graduate Spanish reading requirement. Several programs grant exemption from further examination for successful completion of this course (not for M.A. or Ph.D. candidates in Spanish).

Spring, 3 credits, ABCF grading

SPN 501 Historical Linguistics

General processes of language change, as exemplified by the development of the Romance languages, with particular reference to Spanish.

Spring, 3 credits, ABCF grading

SPN 502 Methods in Linguistics Research

Methods for elicitation and collection of linguistic data and their analysis. Relation

between theory and research design, and between qualitative and quantitative analysis. Introduction to commonly used tests of statistical significance, and to reasoning and argumentation from limited data.

Spring, 3 credits, ABCF grading

SPN 503 Spanish Linguistics

Major issues related to the general structure of the Spanish language (phonetics, phonology, morphosyntax, semantics, etc.).

Spring, 3 credits, ABCF grading

May be repeated for credit

SPN 504 Contrastive Analysis: Spanish and English

Topics vary, and may include linguistic interference and its basis and manifestations, in-depth discussion of specific syntactic/semantic areas with reference to possible Spanish/English interference, major phonological differences between Spanish and English and consequent learning difficulties, and nonlinguistic factors that may affect learning in different groups in different situations.

Spring, 3 credits, ABCF grading

May be repeated for credit

SPN 505 Hispanic Dialectology and Sociolinguistics

Major theoretical issues involved in analysis of geographical and social variation and with the principal methods used in its investigation, as applied to varieties of Spanish, Portuguese, Catalan, and Galician.

Spring, 3 credits, ABCF grading

May be repeated for credit

SPN 510 Hispanic Culture

An introduction to the essential aspects of Peninsular and, or Latin American cultures and civilizations, designed to provide incoming graduate students with sufficient background to undertake the advanced study of Hispanic languages and literature.

Spring, 3 credits, ABCF grading

May be repeated for credit

SPN 515 Spanish Composition and Stylistics

Theory and practice of problems in composition and translation with revision of difficult points in advanced Spanish grammar. Classroom analysis and discussion. Required for Doctor of Arts (DLS) students; also useful for M.A. and Ph.D. students.

Spring, 3 credits, ABCF grading

SPN 523 Golden Age Literature

Major literary works within the Renaissance and/or baroque periods are read and analyzed in depth, and their interrelation with the cultural context is discussed.

Spring, 3 credits, ABCF grading

May be repeated for credit

SPN 562 19th-Century Spanish-American Literature

Major authors and literary works of the period. Readings will be analyzed and discussed in depth, and their interrelation with the cultural context will be discussed.

Spring, 3 credits, ABCF grading

May be repeated for credit

SPN 582 The Hispanic Tradition in the United States

A general historical analysis of the influence of Hispanic culture in the United States as a consequence of the continuous interaction between Spanish- and English-speaking people. Special attention is given to cultural manifestation in a bicultural setting.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

SPN 585 Caribbean Literature

A course devoted to major writers and works of the Caribbean area. Readings will be analyzed in relation to cultural contexts.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

SPN 588 Directed Master's Research

For work toward the M.A. thesis or preparation for the M.A. comprehensive examination only. This course is mainly intended for students who are not continuing toward the Ph.D.

*Fall and spring, 1-6 credits, ABCF grading
May be repeated for credit*

SPN 595 Directed Independent Individual Studies

For M.A. and Ph.D. candidates only. Requires a written proposal signed by the faculty member involved and the approval of the graduate program director and the departmental chairperson. No more than a total of nine credits may be applied toward a Spanish graduate degree or combination of degrees.

*Fall and spring, 1-6 credits, ABCF grading
May be repeated for credit*

SPN 609 Literary Theory

A study of the most outstanding methods of analysis and literary research, and a survey of major works pertaining to the study of literature. A required course for students in the Spanish Ph.D. program.

Spring, 3 credits, ABCF grading

SPN 612 Topics Seminar

A seminar course designed primarily for doctoral students. The topic will be chosen by the professor from any of the major areas of Hispanic literature and linguistics required of all Ph.D. students. Ph.D. students must take from two to four of these seminars depending on their previous preparation.

*Fall and spring, 3 credits, ABCF grading
May be repeated for credit*

SPN 613 Medieval Literature

Major literary works of the medieval period will be read and discussed in depth, and their interrelation with the cultural context analyzed.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

SPN 628 Cervantes

Miguel de Cervantes' works are read, analyzed, and discussed in depth. A required course for Ph.D. students. Advanced D.A. and M.A. students are accepted. A bilingual course: readings and discussions in both Spanish and English.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

SPN 641 19th-Century Spanish Literature until the Generation of 1898

Major literary works of the period are read and analyzed in depth, and their interrelation with the cultural context is discussed.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

SPN 643 20th-Century Spanish Literature

Major literary works of the period will be read, analyzed, and discussed in depth, and their interrelation with the cultural context will be discussed.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

SPN 652 Colonial Spanish-American Literature

Major authors and literary works of the period. Readings will be analyzed and discussed in depth, and their interrelation with the cultural context explored.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

SPN 669 Spanish-American Modernism

A course devoted to major authors and literary works of the modernistic period (1880-1916) in Spanish America. Readings are analyzed and discussed. A required course for Ph.D. students. Advanced D.A. and M.A. students are accepted.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

SPN 671 20th-Century Spanish-American Literature

A course devoted to major authors and literary works of the period. Readings will be analyzed and discussed in depth, and their interrelation with the cultural context discussed.

*Fall or spring, 3 credits, ABCF grading
May be repeated for credit*

SPN 681 Directed Readings

For students who have completed all doctoral requirements and wish to dedicate themselves to full-or part-time preparation for the comprehensive examination.

*Fall and spring, 1-9 credits, S/U grading
May be repeated for credit*

SPN 691 Practicum in the Teaching of Spanish Language

Theory and practice of language teaching. Applied methodology and linguistics in classroom situations. A required course for teaching assistants.

Fall, 3 credits, ABCF grading

SPN 693 Practicum in the Teaching of Spanish Language

This course is to be taken in conjunction with the student's teaching assignment. Each week's discussion centers on problems of applied linguistics or grammar. Discussion will also be focused on methodology (audio-lingual method, pattern drills, language laboratory, and preparation of examinations).

*Fall and spring, 3 credits, S/U grading
May be repeated for credit*

SPN 699 Dissertation Research on Campus

For students who have already passed the Ph.D. comprehensive examination and need to devote their time to preparation of their dissertation.

*Prerequisites: Ph.D. comprehensive examination completed and advanced to candidacy (G5); permission of the dissertation director, graduate program director, or department chairperson; major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

SPN 700 Dissertation Research off Campus—Domestic

*Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

SPN 701 Dissertation Research off Campus—International

*Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

SPN 800 Summer Research

May be repeated for credit

D.A. in Foreign Language: Spanish**DLS 699 Dissertation Research on Campus**

*Prerequisite: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab
Fall, spring, and summer, 1-6 credits, S/U grading*

DLS 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor
 Fall, spring, and summer, 1-9 credits, S/U grading
 May be repeated for credit

DLS 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if other plan is deemed comparable); all international students must receive clearance from an International Advisor
 Fall, spring, summer, 1-9 credits, S/U grading
 May be repeated for credit

Portuguese Courses**POR 500 Reading Portuguese**

Systematic instruction in the fundamentals of reading comprehension and in specialized subject-oriented vocabulary.
 Spring, 3 credits, ABCF grading

POR 575 Luso-Brazilian Readings

Major literary works from 19th- and 20th-century Portugal and Brazil, especially narratives.
 Spring, 3 credits, ABCF grading
 May be repeated for credit

Language Learning and Research Center Courses**DLL 570 Introduction to Media for Language Teaching**

Course open to non-DA graduate students. Gives students an introduction to all of the technology used in teaching languages: audio, video, computer, and internet. Emphasis is on hands-on use and practical applications. Offered as DLL 570 and FLA 570.
 Spring, 3 credits, ABCF grading

DLL 571 Foreign Language Technology and Education

Course open to non-D.A. graduate students. Assumes knowledge of material taught in DLL/FLA 570. Addresses more globally and more theoretically the intersection between technology and languages. Issues of cognitive learning theory and educational psychology addressed. Offered as DLL 571 and FLA 571.
 Spring, 3 credits, ABCF grading

DLL 572 Practicum in Language Center Directorship

Allows students to work in a state-of-the-art language center and prepare a project dealing with technology and languages.
 Spring, 3 credits, S/U grading

DLL 601 Internship in Language Center Directorship

Students work as an Associate Director of Stony Brook's Language Learning and Research Center. They learn about basic accounting, budgeting, and management in a Language Center as well as teach short courses and workshops relating to technology and languages.
 Spring, 3 credits, ABCF grading

DLL 602 Externship in Language Center Directorship

As above in DLL 601 except work is done off-campus in a Language Center not located at the University.
 Spring, 3 credits, S/U grading

History (HIS)

Chairperson: Ned Landsman, Ward Melville Social and Behavioral Sciences Building N-309 (631) 632-7510/7500

Graduate Program Director: Young-sun Hong, Ward Melville Social and Behavioral Sciences Building N-311 (631) 632-7490/7561

Graduate Program Coordinator: Pat Klosowicz, Ward Melville Social and Behavioral Sciences Building S-303 (631) 632-7490

Degrees awarded: M.A. in History; Ph.D. in History; M.A.T. in Social Studies Education

The Department of History has a faculty of 28 distinguished researchers and teachers. Each year 12 to 15 students are admitted into the doctoral program and four to six students into the terminal master's program. The department has 118 full- and part-time graduate students. The History Department also offers an M.A.T. Program in Social Studies Education in conjunction with the School of Professional Development.

While the department has strength in a number of traditional areas of historical study, it also has a long tradition of comparative, interdisciplinary, and theoretically informed research. The graduate program has been structured around four areas of thematic inquiry—1) Women, Gender, Sexuality, and Reproduction; 2) Nation, State, and Civil Society; 3) Empire, Modernity, and Globalization; and 4) Environment, Science, and Health—to bring these theoretical issues to the fore and ensure that students learn how to apply such concepts as class, gender, race, culture, power, religion, and environment in an explicit and sophisticated manner to the study of the past. To further these interests, the department maintains close connections with the Stony Brook Humanities Institute, the doctoral program in Comparative Literature and Cultural Studies, the Women's Studies Program, Africana Studies, the Latin American and Caribbean Studies Program, and the Center for Global History, as well as the departments from which these programs draw their core faculty.

The master's program, which requires students to complete 30 credits of graduate study with a grade of B or higher, allows students to explore the history and historiography of their chosen area of concentration. Students in the master's program follow the same basic course of study as that followed by doctoral students during their first year, and the oral examination serves as the capstone experience for the master's program.

The Ph.D. program is designed to prepare students to carry out original research and to ultimately pursue a career at the university level. Doctoral

students may choose to focus their study on a particular region and period or they may concentrate in one of the thematic areas of study described above, and all students are encouraged to work with faculty in other departments. Full-time students in the doctoral program typically take courses for their first six semesters in the program and take their qualifying examinations at the end of their third year.

Admission to the M.A. and Ph.D. Programs

In addition to the requirements of the Graduate School, the minimum requirements for admission to the graduate program in history are:

A. A bachelor's degree in history or its equivalent with a minimum grade point average of 2.75 (B-) in all undergraduate coursework and 3.00 (B) in history courses.

B. Three letters of recommendation that address the applicant's potential to succeed in a rigorous course of graduate study.

C. Submission of scores from the Graduate Record Examination (GRE) General Test. The subject area test in history is not required.

D. Students whose first language is not English must submit scores from the Test of English as a Foreign Language (TOEFL). Students must score at least a 550 on the test.

With the approval of the dean of the Graduate School and the History Department, a student holding an M.A. degree from another accredited institution may be admitted directly to the Ph.D. program at Stony Brook. In special cases, students who do not have a bachelor's degree in history or whose GPA does not meet the requirements stated above may be admitted on a provisional basis for M.A. study only. After completing the master's program, such students may apply for admission to the doctoral program.

Please note that students are only admitted to the M.A. and Ph.D. programs for study beginning in the fall semester.

Admission to the M.A.T. Program

Applicants to the M.A.T. Program are required to have either a) a bachelor's degree in history, b) a bachelor's degree in one of the social sciences (excluding psychology, linguistics, and communications) and have at least 18 credits in history, or c) completed a course of study equivalent to an undergraduate degree in history. Applicants are expected to have the intellectual skills to successfully complete advanced study in history and have the dispositions necessary to become an effective secondary school teacher. Individuals who already have certification and who are either seeking a master's degree for professional certification or who are seeking a second certification in social studies may not apply to the M.A.T. programs.

Applications can be obtained from the School of Professional Development. Applicants must submit:

A. Official transcripts of undergraduate study.

B. Three letters of recommendation testifying to the applicant's ability to succeed in graduate-level coursework and his or her dispositions to work successfully with children.

C. Submission of scores on the Graduate Record Examination (GRE) General Test.

For more information regarding the M.A.T. in Social Studies, see the SPD section of this bulletin.

Faculty

Professors

Barnhart, Michael^{1,2,3,8}, Ph.D., 1980, Harvard University: U.S. foreign policy; 20th-century U.S. history; modern Japan.

Bottigheimer, Karl S., *Emeritus*. Ph.D., 1965, University of California, Berkeley: Tudor-Stuart England and Ireland; early modern Europe; modern Ireland.

Cowan, Ruth Schwarz, *Emerita*. Ph.D. 1969, Johns Hopkins University: Modern science, technology, and medicine.

Garber, Elizabeth, Ph.D., 1966, Case Western Reserve University: Social and intellectual history of science; 19th- and 20th-century physics; European intellectual and social history.

Goldenberg, Robert, Ph.D., 1974, Brown University: Jewish history and religion in late antiquity; rabbinic literature and exegesis; history of Jewish thought; rabbinic hermeneutics; ancient history.

Gootenberg, Paul, Ph.D., 1985, University of Chicago: Modern Latin America (Andes and Mexico); economic history; state-formation; commodities; drugs.

Landsman, Ned, *Chairperson*. Ph.D., 1979, University of Pennsylvania: Early American history and Scotland.

Larson, Brooke, Ph.D., 1978, Columbia University: Colonial and modern Latin America; Andean rural societies; race, ethnicity, and nation-making.

Lebovics, Herman, Ph.D., 1965, Yale University: Modern Europe; intellectual and cultural history; Germany and France.

Lemay, Helen R.^{4a}, Ph.D., 1972, Columbia University: Medieval and Renaissance intellectual history; paleography; history of science and medicine; women's history.

Marker, Gary J., Ph.D., 1977, University of California, Berkeley: Russian social and intellectual history; history of printing; European labor history.

Miller, Wilbur R., Ph.D., 1973, Columbia University: U.S. social and political history; Civil War and Reconstruction; crime and criminal justice history.

Rosenthal, Joel T., Ph.D., 1963, University of Chicago: Medieval history; medieval England; social history.

Roxborough, Ian⁷, Ph.D., 1977, University of Wisconsin: Social history of Latin America; modern Mexico; war and the military.

Sanderson, Warren⁹, Ph.D., 1974, Stanford University: U.S. economic history; demography.

Schäfer, Wolf, Dr. Phil., 1983, University of Bremen, Germany: History of technoscience; social history; global history.

Seifman, Eli, *Emeritus*. Ph.D., 1965, New York University: U.S. social history; history of education; the People's Republic of China.

Tomes, Nancy J., Ph.D., 1978, University of Pennsylvania: American social and cultural history; medicine, nursing, and psychiatry; women and the family.

Vaughan, Olufemi^{2,5}, D.Phil., 1989, University of Oxford: African politics and history; international relations.

Weinstein, Fred, *Emeritus*. Ph.D., 1962, University of California, Berkeley: Theory in history; Russian and European history.

Wilson, Kathleen, Ph.D., 1985, Yale

University: British social, cultural, and political, 17th-19th centuries; cultures of imperialism; gender studies; cultural, feminist, and postcolonial theory.

Zimansky, Paul¹⁰, Ph.D., 1980, University of Chicago: Near Eastern languages and civilizations; Near Eastern archaeology and history.

Associate Professors

Cash, Floris B.⁵, Ph.D., 1986, Stony Brook University: African-American history; African-American women's studies.

Hong, Young-Sun, Ph.D., 1989 University of Michigan: Modern Germany; social theory; culture and politics in Germany; culture and politics in modern Europe; gender history.

Klubbock, Thomas, Ph.D., 1993, Yale University: Modern Latin America; labor, gender, and environmental history.

Lim, Shirley, Ph.D., 1998, UCLA: Asian-American women's cultural history.

Lipton, Sara, Ph.D., 1991, Yale University: Medieval cultural and religious history; Jewish-Christian relations; gender.

Man-Cheong, Iona, Ph.D., 1991, Yale University: Modern China; late imperial China; women and gender; Chinese diaspora.

Owens, Leslie H.⁵, Ph.D., 1972, University of California, Riverside: African-American history; U.S. southern history.

Rilling, Donna J., Ph.D., 1993, University of Pennsylvania: Early national U.S. history; business, legal, urban, and labor history.

Sellers, Christopher, Ph.D., 1992, Yale University; M.D., University of North Carolina, Chapel Hill, 1992: U.S. environmental, industrial, and cultural history; history of medicine and the body.

Williams, John A., *Emeritus*. Ph.D., 1963, University of Wisconsin: British Empire; Africa; the Commonwealth; expansion of Europe.

Wishnia, Judith⁶, *Emerita*. Ph.D., 1978, Stony Brook University: Modern Europe; France; labor history; women's history.

Assistant Professors

Chronopoulos, Themis, Ph.D., 2004, Brown University: U.S. urban history, race, and ethnicity; popular culture; public policy; world cities.

Cooper, Alix, Ph.D., 1998, Harvard University: Early modern Europe/world; history of science, medicine, and technology; environmental history; cross-cultural encounters.

Frohman, Larry, Ph.D., 1992, University of California, Berkeley: European intellectual history; history of welfare and social policy; social studies education.

Joseph, Peniel⁵, Ph.D., 2000, Temple University: African-American history; civil rights black power movements; black cultural, social, political, and intellectual history; black feminism; African diaspora; global studies; race and urban history.

Masten, April, Ph.D., 1999, Rutgers University: 19th century U.S. cultural history.

Mimura, Janis, Ph.D., 2002, University of California, Berkeley: Japan.

Ritscherle, Alice, Ph.D., 2005, University of Michigan: Modern British social and cultural colonialism and imperialism; modern Ireland.

Lecturer

Backfish, Charles, A.M., New York University, 1968: Social studies education.

Hinely, Susan, Ph.D., 1987, Stanford University; J.D., 1983, Harvard Law School: European history and women's history.

LaMantia, Mario, M.A. Liberal Arts, 1973; M.A. Sociology, 1975, Stony Brook University: Social studies education.

Number of teaching, graduate, and research assistants, fall 2005: 25

1) Recipient of the President's Award for Excellence in Teaching

2) Recipient of the State University Chancellor's Award for Excellence in Teaching

3) Recipient of the Teaching Merit Award

4) Recipient of the President's Award for Excellence in Teaching

5) Joint appointment, *Africana Studies*

6) Joint appointment, *Women's Studies*

7) Joint appointment, *Sociology*

8) Distinguished Teaching Professor

9) Joint appointment, *Economics*

10) Joint appointment, *Anthropology*

Degree Requirements

Requirements for the M.A. Degree

In addition to the requirements imposed by the Graduate School, the following are required:

A. Coursework

1. Core Seminar (HIS 525/526, 3 credits each semester): This course provides an intensive, year-long introduction to historical theory and research and familiarizes students with the thematic organization of the Stony Brook graduate program. All full-time students in the master's and doctoral programs are required to take this course, which is offered only as a fall/spring sequence, during their first year.

2. Two Field Seminars (3 credits each): The department offers a number of field seminars designed to familiarize students with the history and historiography of specific regions. These courses include HIS 501/502, 521/522, 541/542, 561, and 562. These courses are offered—at minimum—on a two-year cycle, though many of these are offered each year. Students choosing to concentrate in the history of a specific region are encouraged, but not required, to

complete both parts of the field seminar sequence where available.

3. Two Theme Seminars (3 credits each): The theme seminars are the heart of the department's commitment to the theoretically informed, interdisciplinary study of history. Theme seminars are offered in the following areas:

1) Women, Gender, Sexuality, and Reproduction; 2) Nation-State and Civil Society; 3) Empire, Modernity, and Globalization; and 4) Environment, Science, and Health. A minimum of two theme seminars are offered each semester. Topics change regularly, and students are free to choose among the theme seminars being offered.

4. Four Electives (3 credits each):

The remaining 12 credits can be selected from field seminars, theme seminars, the graduate courses offered in conjunction with other departments (e.g., Sociology, Africana Studies, and Comparative Literature and Cultural Studies), and workshops.

B. Language Requirement

Master's students with a concentration in European history must pass a written exam in an appropriate foreign language, and master's students in Latin American history must pass a written exam in Spanish or Portuguese. The other areas of concentration do not require a foreign language for the master's degree.

C. Oral Examination

By the second semester in the program, the student, in consultation with her/his advisor, should name two other members of the department as her/his examination committee. The committee will help the student define her/his examination field based on her/his coursework and reading in the program.

The oral examination is taken at the end of the student's course of study. By the end of the semester that precedes the examination, the student shall present a list of books read to each member of the examining committee. At that time the committee shall advise the student of any additional reading to be completed before the examination. This reading may be completed as part of an orals workshop during the semester of the examination. The student should see the graduate

program coordinator to set the time and date of the examination. The examination will be based on the student's examination field. The committee will grade the examination "pass with distinction," "pass," or "fail."

Requirements for the Master of Arts in Teaching (M.A.T.) in Social Studies

The Master of Arts in Teaching in Social Studies Program, offered in conjunction with the School of Professional Development, leads to New York State initial certification for teaching social studies in secondary schools. Completion of the M.A.T. requires at least three semesters of work for full-time students.

A. Courses

History Courses

HIS 500 Historiography (3 credits) and 12 credits from the following:

CEG 532 U.S. History to Civil War
CEG 522 U.S. History since Civil War
CEG 516 Early Modern Europe
CEG 524 Late Modern Europe
HIS 541 Colonial Latin America
CEG 517 Modern Latin America
CEG 534 Topics Seminar: Africa
CEJ 501 Traditional China: Culture and Society
CEJ 502 Modern China: Culture and Society

Pedagogy Courses

CEE 505 Education: Theory and Practice (3 credits)
CEE 565 Human Development (3 credits)
LIN 544 Language Acquisition and Literacy Development
CEE 577 Teaching Social Studies (fall only) (3 credits)
CEF 548 Field Experience I Grades 7 to 9 (1 credit, S/U, must be taken concurrently with CEE 577)
CEE 578 Social Studies Strategies (spring only) (3 credits)
CEF 549 Field Experience II Grades 10 to 12 (1 credit, S/U, must be taken concurrently with CEE 578)
CEE 580 Student Teaching Seminar
CEQ 581 Supervised Student Teaching Grades 7 to 9
CEQ 582 Supervised Student Teaching Grades 10 to 12

Students in the MAT program must also meet the requirements of the Professional Education Program and

satisfy the Social Studies Education Program distribution requirements.

Requirements for the Ph.D. Degree

The Ph.D. is the highest professional degree granted by the History Department. Candidates must have been formally admitted to the Ph.D. program in history and have an advisor/thesis director who has agreed in writing, even if conditionally, to guide the student through the Ph.D. qualifying examinations and direct the dissertation.

The Ph.D. program is supervised by a Ph.D. preparation committee made up of members of the graduate faculty in fields and/or topics in which the student has chosen to specialize. The course of study and language requirements will be determined jointly by the student and the Ph.D. committee. The qualifying examination will test the student's knowledge in two fields. The first field should be a theoretical and/or comparative field chosen from the graduate program's thematic fields as applied to a specific region and period. The second field may be defined primarily in terms of region, period, and topic (such as social history, environmental history, diplomatic history, etc.).

A. Coursework

Students in the doctoral program are expected to complete three years of coursework distributed in the manner outlined below. At the end of the third year, students take a comprehensive examination designed to assess their mastery of the subject matter, conceptual tools, and research skills necessary to undertake independent research for the dissertation. The dissertation is to be a substantial piece of original research completed independently by the student, and all students are required to defend their dissertation orally at the end of their course of study.

Students in the doctoral program are required to take the following courses:

1. Core Seminar (HIS 525/526, 3 credits each semester): This course provides an intensive, year-long introduction to historical theory and research and familiarizes students with the thematic organization of the graduate program. All full-time students in the master's and doctoral programs are required to take this course, which is offered only as a fall/spring sequence, during their first year.

2. Two Field Seminars (3 credits each): The department offers a number of field seminars designed to familiarize students with the history and historiography of specific regions and periods. These courses include HIS 501/502, 521/522, 541/542, 561, and 562. These courses are offered—at minimum—on a two-year cycle, though many are offered each year. Students choosing to concentrate in the history of a specific region are encouraged to take one field seminar dealing with a region outside of their area of concentration. Students are strongly encouraged to audit relevant undergraduate courses in their geographical area of interest.

3. Three Theme Seminars (3 credits each). A minimum of two theme seminars are offered each semester. Topics change regularly, and students are free to choose among the theme seminars being offered.

4. Three Research Seminars (3 credits each): Research seminars will typically have a set of common core readings, but they are designed to give students the opportunity to carry out individual original research projects in areas related to their developing scholarly interests. Research seminars are generally taken during the second and third years, and the final research seminar is generally taken in conjunction with the dissertation prospectus workshop.

5. Supervised Teaching (HIS 581, 3 credits): All students who hold teaching assistantships must register for this course.

6. Teaching Practicum (HIS 582, 3 credits): This course must be taken by all students who hold teaching assistantships during the first semester in which they work as a teaching assistant. This course will provide an opportunity for students to discuss classroom teaching issues as they occur, and it offers a forum for understanding problems of classroom authority, student-teacher relations, plagiarism, sexual harassment, etc. Students may be required to attend teaching workshops offered by the History Department or the Graduate School in addition to their other TA duties. These workshops are also open to students who do not hold teaching assistantships.

7. Dissertation Prospectus Workshop (HIS 695, 3 credits): This course must

be taken by all students and should be completed either before or in the same semester as the qualifying examination. This workshop helps students prepare their dissertation prospectus. The prospectus should contain: an explanation of the research problem under investigation; a summary of the relevant secondary literature; a statement of hypothesis; an outline of both research sources (especially primary materials); and methods the student expects to employ. The prospectus must be acceptable to both the instructor of the workshop and to the student's Ph.D. committee. The prospectus workshop should be completed either before or in the same semester as the qualifying examination. This workshop will be offered once each year in the spring semester. Completion of the workshop and the dissertation prospectus are required for advancement to candidacy. The course grade is S/U.

As part of the coursework taken prior to the qualifying examination, students may also enroll in the following workshops:

8. Reading Workshops (3 credits each): In addition to their regularly scheduled courses, faculty also supervise organized reading courses known as workshops. The department is committed to this kind of collective independent study rather than individual directed readings. Students are encouraged to propose workshop topics collectively that meet their specific needs and intellectual interests and to arrange with appropriate faculty members to offer them. Workshops often provide an opportunity for groups of students to explore systematically the historiography of a particular nation or region that is not directly addressed through a field seminar.

9. Orals Workshops (6 credits, HIS 682, 684, 685, 686): In the fall semester of their third year, students will normally enroll in the Orals Workshop. This is an independent readings course in which students are expected to read intensively in preparation for their oral examinations. Students register for this course under the number of their principal advisor.

Students who hold a master's degree from another institution may be exempted from the required first-year courses. However, core seminars are rarely waived. In some cases, the advi-

sor may require incoming students with a master's degree to take the relevant field seminars and other first-year courses. These decisions will be based on an evaluation of the student's coursework and performance in the prior master's program and on the amount of time that elapsed between the granting of the master's degree and entrance into the Ph.D. program.

Below is a sample course of study that might be followed by a first-year student without a master's degree who also holds a teaching assistantship:

Fall (12 credits)

Core Seminar I (HIS 525) (3 credits)

Field Seminar (3 credits)

Teaching Practicum (HIS 582) (3 credits)

Reading Workshop (3 credits)

Spring (12 credits)

Core Seminar II (HIS 526) (3 credits)

Supervised Teaching (HIS 581) (3 credits)

Theme Seminar (3 credits)

Reading Workshop (3 credits)

B. Full-time Status

Students who have not yet advanced to G4 status are required to take 12 credits in order to maintain full-time status. Full-time enrollment for students who have achieved G4 status is 9 credits. Students acting as teaching assistants must carry a full-time load (including the 3-credit Supervised Teaching, HIS 581).

C. Award of Master's Degree

Doctoral students who have completed the requirements for the master's degree may petition the Graduate school to be awarded the master's degree while continuing in the doctoral program.

D. Foreign Language Requirement

All students must demonstrate proficiency in at least one relevant foreign language before a student may be advanced to Ph.D. candidacy. This is a Graduate School requirement that may not be waived. Minimal proficiency in a language means the ability to translate a given passage clearly and accurately with the aid of a dictionary.

Relevant language(s) are determined by the student's area of specialization. Students in U.S. history must be proficient in one foreign language. Students in European history are usually expected to show proficiency in two

languages; these students should pass at least one language exam by the end of the third semester in the program and the other before being advanced to candidacy. All students in Latin American history must be proficient in Spanish, except for those studying Brazil, who may choose Portuguese.

Proficiency may be demonstrated either through a written exam administered by the department or a satisfactory grade in a graduate language course (e.g., French 500).

At the discretion of the advisor, a student may be required to study additional languages as part of his or her degree program. It is the student's responsibility to establish with her or his advisor which foreign languages are necessary for the completion of the Ph.D.

E. Qualifying Examination and Advancement to Candidacy

By the second year in the doctoral program, students should name a Ph.D. advisor and, in consultation with that advisor, name three additional faculty members (one of whom may be from outside the department) who agree to serve on his or her Ph.D. oral examination committee. The committee will help the student define his or her examination fields, language requirements, and coursework, as well as monitor the student's progress on the dissertation. The student is also expected to define two fields of concentration that will be the focus of the student's qualifying examination. The first field should be a theoretical and/or comparative field chosen from the graduate program's thematic fields as applied to a specific region and period. The second field may be defined primarily in terms of region, period, and topic (such as social history, environmental history, diplomatic history, etc.).

Full-time students are normally expected to take their qualifying examination no later than the end of their sixth semester of graduate study. The student—in consultation with the examination committee—will decide the precise timing of the exam. However, the student shall present a list of books read to each member of the examination committee no later than the middle of the semester that precedes the Ph.D. oral examination. At that point, the committee shall advise the student of any additional reading that is to be completed for the examination. The necessary reading

will then be completed as part of an orals workshop during the semester of the examination. The exam is based explicitly and exclusively on seminar work and on mastery of the reading list to be jointly determined by the student, and the student should be prepared to discuss the readings with reference to his or her dissertation prospectus. The examination normally lasts approximately two hours. The committee will grade the examination "pass with distinction," "pass," "weak pass," or "fail."

F. Dissertation Committee

Normally, the Ph.D. advisor and committee will serve as the student's dissertation committee, which will be constituted immediately following advancement to Ph.D. candidacy. If the Ph.D. advisor is unwilling to serve as dissertation advisor, one member of the department must declare in writing his or her willingness to serve as dissertation advisor before the student may be advanced to candidacy.

The dissertation advisor will meet with the student at least once each semester (or, if the student is not in Stony Brook, will correspond) to discuss progress on the dissertation. The dissertation will schedule the student's final dissertation defense, which will be attended by the dissertation committee, an outside examiner as required by the Graduate School (chosen by the student in consultation with her/his Committee), and interested faculty and students.

G. Dissertation and Defense

Following advancement to candidacy, students are required to enroll for one credit of dissertation research each semester until the dissertation is completed. Teaching assistants will register for 9 credits of Research for the Ph.D. (HIS 699).

The dissertation is the basic requirement for the conferral of the Ph.D. The completed dissertation must be in the hands of the committee two full months before the scheduled date of the dissertation defense. The dissertation committee has one month to read and correct the dissertation and to give the student their written criticisms and suggestions. These must be in the student's hands one month before the dissertation defense. If the criticisms are not written out, the student can assume the dissertation is approved in the form submitted. All written objections and corrections must be answered by revising the dissertation to the faculty member's satisfac-

tion during the month preceding the dissertation colloquium.

All dissertations must be discussed at a final dissertation defense which is to be attended by the student's advisor and committee, as well as by an outside reader. The defense is also open to interested students and faculty.

Courses

HIS 500 Historiography

Introduction to historiography through reading and writing about interpretations of history, historical methods, and major historians. Term paper on historian of choice.

Prerequisite: Enrollment in a graduate history program

3 credits, ABCF grading

HIS 501 Introduction to Early Modern Europe

Field seminar in early modern European history, 1450-1789. Surveys the major historical problems and interpretations from the Renaissance to the coming of the French Revolution. Required for M.A. students in European history.

Prerequisite: Enrollment in a graduate history program

3 credits, ABCF grading

HIS 502 Introduction to Late Modern Europe

Field seminar in late modern European history, 1789-1945. Surveys the major historical problems and interpretations from the French Revolution through the Second World War. Required for M.A. students in European history.

Prerequisite: Enrollment in a graduate history program

3 credits, ABCF grading

HIS 515 Theme Seminars on Empire, Modernity, and Globalization

Prerequisite: Enrollment in a graduate history program

HIS 516 Theme Seminars on Empire, Modernity, and Globalization

Prerequisite: Enrollment in a graduate history program

HIS 517 Theme Seminars on Empire, Modernity, and Globalization

Prerequisite: Enrollment in a graduate history program

HIS 521 Introduction to United States History to the Civil War

Field seminar in U.S. history from the founding of the British colonies to the beginning of the Civil War. Surveys the major topics and interpretations. Required for M.A. students in U.S. history.

3 credits, ABCF grading

HIS 522 Introduction to United States History Since the Civil War

Field seminar in U.S. history from the Civil War to the Cold War. Surveys the major interpretations.

Prerequisite: Enrollment in a graduate history program

3 credits, ABCF grading

HIS 524 Core Seminar: History, Theory, and Practice

Introduction to the theory, practice and writing of history through the reading of theoretical and historical texts and the writing of a research paper. This course meets over the entire academic year, for 3 credits per semester, and is mandatory for all new Ph.D. students. Students entering with an M.A. take it at the discretion of their advisor.

Prerequisite: Enrollment in a graduate history program
3 credits, ABCF grading

HIS 525 Core Seminar: History, Theory, and Practice

Introduction to the theory, practice and writing of history through the reading of theoretical and historical texts and the writing of a research paper. This course meets over the entire academic year, for 3 credits per semester, and is mandatory for all new Ph.D. students. Students entering with an M.A. take it at the discretion of their advisor.

Prerequisite: Enrollment in a graduate history program
3 credits, ABCF grading

HIS 526 Core Seminar: History, Theory, and Practice

Introduction to the theory, practice and writing of history through the reading of theoretical and historical texts and the writing of a research paper. This course meets over the entire academic year, for 3 credits per semester, and is mandatory for all new Ph.D. students. Students entering with an M.A. take it at the discretion of their advisor.

Prerequisite: Enrollment in a graduate history program
3 credits, ABCF grading

HIS 527 Core Seminar: History, Theory, and Practice

Introduction to the theory, practice and writing of history through the reading of theoretical and historical texts and the writing of a research paper. This course meets over the entire academic year, for 3 credits per semester, and is mandatory for all new Ph.D. students. Students entering with an M.A. take it at the discretion of their advisor.

Prerequisite: Enrollment in a graduate history program
3 credits, ABCF grading

HIS 532 Theme Seminar: Gender, Religion, and Modernity

Prerequisite: Enrollment in a graduate history program
May be repeated 5 times for credit

HIS 535 Theme Seminars on Gender, Sexuality, and Reproduction

Prerequisite: Enrollment in a graduate history program

HIS 541 Introduction to Colonial Latin American History

Field seminar in colonial Latin American history. Surveys major historical problems and debates from the colonial period through the wars for independence. Required for M.A. in Latin American history.

Prerequisite: Students must be enrolled in a graduate history program

3 credits, ABCF grading

HIS 542 Introduction to Modern Latin American History

Field seminar in modern Latin American history. Surveys major historical problems and debates from the post-independence period to the present. This course is offered as both CEG 517 and HIS 542. Basic background in Latin American history and culture.

Prerequisite: Enrollment in a graduate history program
3 credits, ABCF grading

HIS 543 Theme Seminars on Gender, Sexuality, and Reproduction

Prerequisite: Enrollment in a graduate history program

HIS 552 Theme Seminar: Mass Media and Journalism in International Perspectives

Prerequisite: Enrollment in a graduate history program

HIS 553 Theme Seminars on Nation, State, and Civil Society

Prerequisite: Enrollment in a graduate history program

HIS 554 Theme Seminars on Nation, State, and Civil Society

Prerequisite: Enrollment in a graduate history program

HIS 555 Theme Seminars on Nation, State, and Civil Society

Prerequisite: Enrollment in a graduate history program

HIS 557 Special Seminars

Topics to be arranged. The seminar is built around actual research activities of students and faculty. The following topics have been covered: Cultural Theory; Sociology of Technology; Micro-sociology; Advanced Topics in Marxist Theory; Sociology of Emotions; Historical Methods; Ethnic Relations; Biosociology; Comparative Stratification; Max Weber; Sociology of the Future; Science of Sociology and Everyday Life; The Study of the World's Advanced Societies; Methods of Behavioral Observation; Social Structure; Sociology of the Family; Cognitive Sociology; Sociology of Work; Transnational Social Movements; Economic Sociology; War and Revolution; Sociology of Gender; Sociology of Culture; Development of Capitalism; Film as a Sociological Research Tool; Funding and Grant Writing; The Three Faces of Social Psychology; A Structural Approach to Organizational Behavior; Professionals and Professionalism; Sociology of Modernity; Globalization and Immigration; Research Support in Sociology; Sociology of Sexual Behavior; Global Sociology; Gender and the Law; Poverty and Homelessness.

Prerequisite: Enrollment in a graduate history program

3 credits, ABCF grading

May be repeated for credit

HIS 562 Introduction to Modern African History and/or Asian History

Field seminar in modern African history. Surveys major topics such as nationalism, anticolonial movements, and modernization.

Note: M.A.T. and M.A./L.S. students must register under CEG 534; crosslisted with HIS 562.

Prerequisite: Enrollment in a graduate history program

3 credits, ABCF grading

May be repeated twice for credit

HIS 563 Introduction to South Asian History

Surveys major topics such as nationalism, anticolonial movements, legacies of British imperialism, and modernization.

Spring, 3 credits, ABCF grading

HIS 564 Introduction to Chinese History

Field seminar in modern Chinese history. Surveys major historical topics from modernization to revolution to reform and sociocultural change. For M.A., M.A.T., Ph.D. students.

Prerequisite: Enrollment in a graduate history program

3 credits, ABCF grading

HIS 565 Introduction to Japanese History

Field Seminar in Modern Japanese History surveys major historical topics from reform and modernization to imperialism and post-war reconstruction. For M.A., M.A.T., Ph.D. students.

3 credits, ABCF grading

HIS 570 Theme Seminars in Environment, Science, and Health

Prerequisite: Enrollment in a graduate history program

Spring

HIS 571 Theme Seminars in Environment, Science, and Health

Prerequisite: Enrollment in a graduate history program

Spring

HIS 572 Theme Seminars in Environment, Science, and Health

Prerequisite: Enrollment in a graduate history program

Spring

HIS 581 Supervised Teaching

Teaching practicum that usually accompanies a student's assistantship.

Prerequisite: Enrollment in a graduate history program

3 credits, S/U grading

HIS 582 Teaching Practicum

Practicum in teaching methods for new assistants. (M.A. workshop required deleted from the curriculum.)

Prerequisite: Enrollment in a graduate history program

3 credits, S/U grading

HIS 584 Directed Readings for M.A. Candidates

Specialized tutorials based on contractual relationship between individual student and faculty. Required for M.A. students.

1-3 credits, S/U grading
May be repeated for credit

HIS 585 Directed Readings for M.A. Candidates

Specialized tutorials based on contractual relationship between individual student and faculty. Required for M.A. students.
1-3 credits, S/U grading
May be repeated for credit

HIS 586 Directed Readings for M.A. Candidates

Specialized tutorials based on contractual relationship between individual student and faculty. Required for M.A. students.
1-3 credits, S/U grading
May be repeated for credit

HIS 595 Reading Colloquium in Women's History

A topics course dealing with such subjects as women in social movements, the place of gender in particular historical circumstances, imperialism and woman, changing views of sexuality, or relations between family policies and other political programs. This course offered as both HIS 595 and WST 595.
Prerequisite: Enrollment in a graduate history program
Spring, 3 credits, ABCF grading

HIS 601 Research Seminars on Social and Cultural History

Prerequisite: Enrollment in a graduate history program

HIS 603 Research Seminar on Social and Cultural History

Prerequisite: Enrollment in a graduate history program

HIS 615 Research Seminars on Empire, Modernity, and Globalization

Prerequisite: Enrollment in a graduate history program

HIS 616 Research Seminars on Social and Cultural History

Prerequisite: Enrollment in a graduate history program

HIS 617 Research Seminars on Empire, Modernity, and Globalization

Prerequisite: Enrollment in a graduate history program

HIS 622 Migration, Diaspora, and Transnationalism

Prerequisite: Enrollment in a graduate history program

HIS 623 Research Seminars on Ethnicity and Migration

Prerequisite: Enrollment in a graduate history program

HIS 631 Research Seminar: The Social History of Medicine and Health

Prerequisite: Enrollment in a graduate history program

HIS 632 Research Seminars on Gender and Sexuality

Prerequisite: Enrollment in a graduate history program

HIS 633 Research Seminars on Gender and Sexuality

Prerequisite: Enrollment in a graduate history program

HIS 634 Research Seminars on Gender and Sexuality

Prerequisite: Enrollment in a graduate history program

HIS 652 Research Seminar: Oral History: Methodology and Theory

Prerequisite: Enrollment in a graduate history program

HIS 653 Research Seminars on Nation, State, and Civil Society

Prerequisite: Enrollment in a graduate history program

HIS 654 Research Seminars on Nation, State, and Civil Society

Prerequisite: Enrollment in a graduate history program

HIS 655 Research Seminars on Nation, State, and Civil Society

Prerequisite: Enrollment in a graduate history program

HIS 682 Directed Readings for Ph.D. Candidates

Specialized tutorials based on contractual relationship between individual student and faculty member.
1-18 credits, S/U grading
May be repeated once for credit

HIS 684 Directed Readings for Ph.D. Candidates

Specialized tutorials based on contractual relationship between individual student and faculty member.
1-18 credits, S/U grading
May be repeated once for credit

HIS 685 Directed Readings for Ph.D. Candidates

Specialized tutorials based on contractual relationship between individual student and faculty member.
1-9 credits, ABCF grading
May be repeated once for credit

HIS 686 Directed Readings for Ph.D. Candidates

Specialized tutorials based on contractual relationship between individual student and faculty member.
1-18 credits, ABCF grading
May be repeated once for credit

HIS 695 Dissertation Prospectus Workshop for Ph.D. Candidates

Required of all Ph.D. candidates in order to prepare a dissertation prospectus. This seminar should be completed either before or in the same semester as the qualifying examination.

Prerequisite: Enrollment in a graduate history program
Offered once each year, 3 credits, S/U grading

HIS 699 Dissertation Research on Campus
Dissertation research under direction of advisor.

Prerequisite: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab.
Fall, spring, and summer, 1-18 credits, S/U grading
May be repeated for credit

HIS 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and the Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

HIS 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside of the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

HIS 800 Full Time Summer Research

May be repeated for credit

Linguistics (LIN, ESL)

Chairperson: Daniel L. Finer, Ward Melville Social and Behavioral Sciences Building S-223 (631) 632-7782

Masters Program Director: Frank Anshen, Ward Melville Social and Behavioral Sciences Building S-227 (631) 632-7776

Doctoral Program Director: Alice C. Harris, Ward Melville Social and Behavioral Sciences Building S-231 (631) 632-7758

Graduate Program Coordinator: Susan Mitchell, Ward Melville Social and Behavioral Sciences Building S-201 (631) 632-7774

Degrees awarded: M.A. in Linguistics; M.A. in Teaching English to Speakers of Other Languages; Ph.D. in Linguistics

The Department of Linguistics, in the College of Arts and Sciences, offers a course of studies leading to the degrees of Master of Arts in Teaching English to Speakers of Other Languages (TESOL) and Doctor of Philosophy in Linguistics. The graduate program in linguistics combines sophisticated instruction in theoretical linguistics with extensive field experience and clinical practice in the area of teaching English to non-native speakers, as well as other areas of applied linguistics.

The M.A. in TESOL is designed to prepare students to become professional teachers, teacher educators, and curriculum designers. The program offers courses in applied linguistics and pedagogy and extensive supervised field experience in schools and the English courses offered by the University for international students. Graduates of the program generally teach English to speakers of other languages in schools, colleges, and universities in the United States and abroad. The requirements of the M.A. TESOL program satisfy a substantial portion of the requirements for New York State certification in TESOL, and students may arrange to complete the requirements for state certification in conjunction with pursuit of the M.A.

The Ph.D. program is designed to prepare students for advanced research in linguistic theory and its applications. Students receive a thorough grounding in the fundamentals of grammatical theory through courses such as syntax, semantics, phonology, phonetics, and morphology. Students develop their research interests further through advanced seminars in Linguistics as well as courses in Psychology, Computer Science, Philosophy, and the interdisciplinary Language, Mind, and Brain seminar series. Students are encouraged to develop an area of concentration beyond their primary specialization by focusing a number of their electives in a specific direction.

The M.A. in Linguistics is part of the Ph.D. in Linguistics. It is granted to

students in the Ph.D. program who satisfactorily complete 30 credits, which include the courses required for the Ph.D.

Laboratory Facilities

The Department of Linguistics has several lab facilities. The Semantics Lab houses MacIntosh computers and is devoted to research and instructional projects in semantics, natural language computation, and software development. The Phonetics Laboratory suite includes a sound-treated room, a teaching lab, and a research lab. Speech analysis platforms available are CLS and Praat. Speech synthesis may be done with HL.Sy. There is also a computer lab with Internet access and printing facilities.

Admission

Interested students should request application forms as early as possible, especially if they plan to apply for financial aid. New applications will be considered for admission to the Ph.D. program for the fall semester only. M.A. applications are normally considered for fall admission.

Ph.D. application materials should be in the department by February 1; M.A. applications will be accepted through March 1. Admission to all programs is competitive and no single factor (GRE scores, letters, grades, etc.) will exclude anyone from being admitted. Similarly, no single factor will ensure admission.

For admission to the graduate programs in the Department of Linguistics, the following, in addition to the minimum Graduate School requirements, are normally required:

A. Four-page application: A non-refundable application fee of \$60 paid by either a personal check, bank check, or a money order must be submitted. Any check drawn on a foreign bank must show a U.S. corresponding bank on the face of the check. Applications cannot be processed without this fee.

B. Baccalaureate Degree: A baccalaureate degree is required. Students must present evidence that such a degree will be awarded by the time they begin

graduate work. A final transcript is also required prior to registration.

C. Official Transcripts: Two official copies of all previous college transcripts, both undergraduate and graduate, must be submitted. If a student attended a junior college and these credits are not listed on the senior college transcript with grades, a separate junior college transcript is required. If transcripts are in a foreign language, certified English translations are required in addition to the original documents.

D. Cumulative Grade Point Average: Students must have a minimum cumulative grade point average of 3.00 (or its foreign equivalent) on a four-point scale. If you have attended graduate school and obtained a master's degree, and the GPA is over 3.00, then the GPA of the undergraduate school can be below 3.00 for regular admission.

E. Letters of Recommendation: Letters of recommendation from three former instructors are required.

F. Graduate Record Examination: There is no subject test for linguistics or TESOL; the general test is all that is required. Have the testing service send a copy of your score to the Linguistics Department.

G. Foreign Language Requirement: Proficiency in a foreign language equivalent to two years of college work is required.

H. English Language Proficiency: English language proficiency is required for all students in the MA and Ph.D. programs. If English is not your first language, you will have to demonstrate proficiency by taking either the TSE or the SPEAK test.

I. Writing Sample: The writing sample should be a short paper (2-3 pages) written for a previous course taken, or if that is not available, a paper on any subject is acceptable.

J. Curriculum Vitae or Resume.

K. TOEFL Score: International students must have obtained a minimum score of 600 on the TOEFL test.

L. Acceptance: Students must be accepted by both the Department of Linguistics and the Graduate School.

Note: Students who do not meet the above requirements may be admitted conditionally. Their status will be reviewed after their first semester of graduate study.

Faculty

Professors

Aronoff, Mark, Ph.D., 1974, Massachusetts Institute of Technology: Morphology; orthography.

Bethin, Christina Y., Ph.D., 1978, University of Illinois: Slavic linguistics; phonology.

Broselow, Ellen, Ph.D., 1976, University of Massachusetts-Amherst: Phonology; phonetics; second language acquisition.

Finer, Daniel L., Ph.D., 1984, University of Massachusetts, Amherst: Syntax; semantics; language acquisition.

Harris, Alice C., Ph.D., 1976, Harvard University: Historical linguistics; morphology; languages of the Caucasus.

Hoberman, Robert, Ph.D., 1983, University of Chicago: Semitic linguistics; phonology; morphology.

Larson, Richard K., Ph.D., 1983, University of Wisconsin: Semantics; syntax.

Associate Professors

Anshen, Frank, Ph.D., 1968, New York University: Sociolinguistics; morphology.

Bailyn, John, F., Ph.D., 1995, Cornell University: Syntax; Russian syntax; Slavic linguistics.

Huffman, Marie K., Ph.D., 1989, University of California, Los Angeles: Phonetics; phonology.

Kaufman, Dorit, Ph.D., 1991, Stony Brook University: Language acquisition and attrition; language education.

Repetti, Lori, Ph.D., 1989, University of California, Los Angeles: Italian linguistics; Romance phonology; Italian dialectology.

Assistant Professor

Ko, Heejeong, Ph.D., 2005, Massachusetts Institute of Technology: Psycholinguistics; syntax.

Number of teaching, graduate, and research assistants, fall 2005: 18

Degree Requirements Requirements for the M.A. Degree in TESOL

In addition to the minimum Graduate School requirements, the following are required:

A. Coursework

- All of the following: 21 credits
LIN 522 Phonetics
LIN 524 TESOL Pedagogy: Theory and Practice and LIN 579 Field Experience N-12
LIN 527 Structure of English
LIN 529 Content-based Language and Literacy Development Practice and LIN 579 Field Experience N-12
LIN 530 Introduction to General Linguistics
LIN 571 Curriculum Design and Evaluation and LIN 578 Field Experience in Adult and Tertiary Contexts
- Two of the following: 6 credits
LIN 525 Contrastive Analysis
LIN 526 Analysis of an Uncommonly Taught Language
LIN 532 Second Language Acquisition
LIN 541 Bilingualism
LIN 542 Sociolinguistics
LIN 555 Error Analysis or any other TESOL-related courses approved by the graduate program director
- Elective: 3 credits
One elective course to be approved by the department

B. Performance

The student must achieve a grade point average (GPA) of B (3.0) or higher in all graduate courses taken at Stony Brook in order to receive a degree.

C. Course Waivers

Certain required courses may be waived for students showing an exceptional background in linguistics or TESOL.

Application for such waivers must be made in writing to the department. In any case, all students must complete 30 graduate credits of approved coursework to receive a degree.

New York State Teacher Certification

TESOL Teacher Certification program requirements are listed in the Professional Education Program (PEP) section of this bulletin.

Ph.D. in Linguistics

In addition to the minimum Graduate School requirements, the following are required:

A. Course Requirements

Students must complete a minimum of 60 credits.

- Required courses
LIN 521 Syntax I
LIN 621 Syntax II
LIN 523 Phonology I
LIN 623 Phonology II
LIN 625 Semantics (Syntax I must be taken before Semantics)

2. Elective courses

Electives may include courses in other departments. The student's choice of electives is decided in conjunction with faculty and must be approved by the doctoral program director.

B. Qualifying Papers

Acceptance by the department of two papers of publishable quality in distinct areas of linguistics (qualifying papers). Each paper will be defended orally before a committee of at least three faculty members, at least two of whom will be full-time faculty from within the department. The inside membership of the two qualifying paper committees must not be identical. The pre-defense draft of a qualifying paper must be submitted to the committee by at least three weeks before the defense date. The final version of the first qualifying paper must be submitted not later than six weeks before the last day of classes of the fifth semester, and the final version of the second qualifying paper must be submitted not later than the last day of classes of the sixth semester. Failure to meet the first deadline will affect the student's priority for funding. Students who have not had the final versions of both qualifying papers accepted by their committees by the end of the sixth semester will normally be dismissed from the program. Public presentation of one of these papers is required.

C. Teaching and Research

Students become qualified in teaching and research by working with faculty on an individual basis as teaching assistants and by participating in research projects. They have the opportunity to prepare and teach undergraduate classes during the academic year and in summer sessions.

D. Advancement to Candidacy

The faculty will recommend a student to the Graduate School for advancement to candidacy upon satisfactory completion of requirements A and B.

E. Dissertation

Acceptance by the department of a dissertation, to be defended orally. Before proceeding to the dissertation, the student must have a dissertation proposal accepted by the dissertation committee. The committee members indicate their acceptance of the proposal by signing the Acceptance of Dissertation Proposal form available in the department office. The dissertation

committee will consist of a minimum of four members, at least three from the full-time faculty in the department and at least one from outside the department (or University). The committee will be chosen by the dissertation supervisor, who will be a full-time member of the department faculty.

F. Language Requirement

Demonstrated knowledge of two foreign languages other than the student's mother tongue; this may be satisfied by any of the following methods:

1. Submission of an analytic paper demonstrating knowledge of the structure of the language.
2. Satisfactory completion of a course in the structure of the language.
3. Satisfactory performance on a standardized exam designed to measure language proficiency.
4. Satisfactory completion of two years of college-level instruction in the language.

Courses

LIN 521 Syntax I

A study of formal grammar as one aspect of our knowledge of language. Concepts and elements of modern syntactic analysis are introduced and motivated using a variety of grammatical phenomena and processes, across a wide range of languages.

Prerequisite: Enrollment in LIN program or permission of instructor
Fall, 3 credits, ABCF grading

LIN 522 Phonetics

A study of articulatory phonetics and the international phonetic alphabet, with intensive practice in phonetic transcription from a wide variety of languages. Acoustic phonetics, speech perception, and the applications of phonetics to foreign language teaching.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor
Fall, 3 credits, ABCF grading

LIN 523 Phonology I

An introduction to the formal study of sound patterns. Problems from various languages serve as the basis for developing a theory of the representation of sound structure.

Prerequisite: Enrollment in LIN program or permission of instructor
Fall, 3 credits, ABCF grading

LIN 524 TESOL Pedagogy: Theory and Practice

Theoretical and practical bases of language and literacy instruction. Inquiry of instructional approaches, standard-based lesson planning, reflective practices, and assessment in the teaching of speaking, listening, reading, and writing. Evaluation of resources and technologies.

Prerequisite: Enrollment in TESOL or LIN program; pre or co-requisite: LIN 530; co-requisite: LIN 579
Fall, 3 credits, ABCF grading

LIN 525 Contrastive Analysis

A survey of linguistic typology and a comparison of various languages as a basis for understanding the errors made by language learners and devising strategies for teaching a foreign language. May be crosslisted with CEL 551.

Spring, 3 credits, ABCF grading

LIN 526 Analysis of an Uncommonly Taught Language

Working from primary and secondary sources, students construct an outline of the phonology, morphology, and syntax of a language previously unknown to them.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor, and LIN 530, or LIN 521 and LIN 523
Fall or spring, 3 credits, ABCF grading
May be repeated for credit language differs

LIN 527 Structure of English

A description of the major sentence elements, subsystems, and productive grammatical processes of English. The justification of grammatical categories, interaction between systems and processes, and notions of standard and correctness are discussed with a view to their application in the ESL classroom.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor
Fall, 3 credits, ABCF grading

LIN 529 Content-based Language and Literacy Development

Theory and practice of language and literacy development across disciplines. Students design standard-based curricular modules and assessment, engage in reflective and collaborative practices, and design and evaluate Web-based technologies.

Co-requisite: LIN 579 (LIN 578 with permission of instructor for non-certification candidates)

Prerequisite: Enrollment in TESOL or LIN program and completion of LIN 524 with a grade of B or higher
Spring, 3 credits, ABCF grading

LIN 530 Introduction to General Linguistics

An introduction to modern theoretical and applied linguistics, including phonology, morphology, syntax, language acquisition, historical linguistics, and sociolinguistics.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor
Fall, 3 credits, ABCF grading

LIN 532 Second Language Acquisition

Study of the acquisition of a second language by children and adults. The focus is on data; the systematicity of the learner's errors, the ease of acquisition in childhood, etc., the adequacy of theories (e.g. interlanguage processes, the monitor model, the critical period) to explain data, and the reliability of methods of obtaining data. Students conduct an empirical study testing a current hypothesis.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor,

and LIN 530, or LIN 521 and 523
3 credits, ABCF grading

LIN 535 Historical Linguistics

A study of linguistic change. Some general topics to be discussed are the genetic classification of languages; language families, language, and prehistory; reconstruction; types of sound change; types of semantic change; borrowing.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor
Fall or spring, 3 credits, ABCF grading

LIN 541 Bilingualism

Study of the social, linguistic, educational, and psychological aspects of bilingualism. May be co-scheduled with CEL 541.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor, and LIN 530, or LIN 521 and LIN 523
3 credits, ABCF grading

LIN 542 Sociolinguistics

An introduction to major topics in sociolinguistics, including variation theory, language attitudes, language planning, language change, and pidgins and creoles.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor
3 credits, ABCF grading

LIN 544 Language Acquisition and Literacy Development

In-depth exploration of the theories of literacy and language development of native English speakers and students who are English language learners in Pre-school through grade 12. The development and assessment of literacy skills among children at various stages of learning development and across disciplines will be examined. Attention will also be given to children with special needs and the integration of technology in the development of literacy skills.

Prerequisite: Enrollment in a teacher preparation program
Fall and spring, 3 credits, ABCF grading

LIN 550 Selected Topics in Linguistics

Topics are announced each semester.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor
Fall and spring, 3 credits, ABCF grading
May be repeated for credit as topic varies

LIN 555 Error Analysis

Study of the systematic errors made by foreign language learners and the potential of various linguistic theories to predict and account for these errors.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor, and LIN 522
Spring, 3 credits, ABCF grading

LIN 571 Curriculum Design and Evaluation

An in-depth study of curriculum design and evaluation with a focus on needs analysis, goals and objectives, approaches to language learning and teaching, assessment, resources, and program evaluation.

Prerequisite: Enrollment in TESOL or LIN program or permission of instructor

*Co-requisite: LIN 578 (LIN 579 with permission of instructor)
Spring, 3 credits, ABCF grading*

LIN 574 Managing Instruction, Assessment, and Resources

Investigation and evaluation of instructional planning and assessment, content-based curriculum development, and technologies for language and literacy development among English language learners in multi-level classrooms. Partnerships with colleagues, parents and the respective communities are explored.

Prerequisites: Enrollment in TESOL or LIN program, completion of LIN 529 with a grade of B or higher, permission of department, New York Teacher Certification examinations: LAST and ELPA

*Co-requisites: LIN 581 and 582
Fall and spring, 3 credits, ABCF grading*

LIN 578 Field Experience in Adult and Tertiary Contexts

Observation, inquiry, and practice of English language instruction and learning in community-based ESL programs or programs on tertiary contexts. 50 hours of fieldwork.

*Co-requisite LIN 529 or LIN 571
Fall and spring, 1 credit, S/U grading
May be repeated for credit*

LIN 579 Field Experience in Grades N-12

Observation, inquiry, and practice in language and literacy development across disciplines for learners from linguistically and culturally diverse backgrounds. Students are placed in variety of educational settings in pre-elementary through secondary levels for 50 hours of fieldwork.

*Co-requisite: LIN 524, LIN 529, or LIN 571
Fall and spring, 1 credit, S/U grading
May be repeated for credit*

LIN 581 Supervised Student Teaching in English as a Second Language: Primary and Middle Level (Grades N-9)

Prospective ESOL teachers receive supervised practice teaching by arrangements with selected Long Island schools. The student teacher reports to the school to which he or she is assigned each full school day for the entire semester. Applications must be filed in the academic year preceding that in which the student plans to take the course.

*Prerequisite: Enrollment in TESOL program, permission of the department
Co-requisite: LIN 582 and LIN 574
Fall and spring, 3 credits, S/U grading*

LIN 582 Supervised Student Teaching in English as a Second Language: High School (Grades 10-12)

Prospective ESOL teachers receive supervised practice teaching by arrangements with selected Long Island schools. The student teacher reports to the school to which he or she is assigned each full school day for the entire semester. Applications must be filed in the academic year preceding that in which the student plans to take the course.

Prerequisite: Enrollment in TESOL program, permission of the department

*Co-requisites: LIN 581 and LIN 574
Fall and spring, 3 credits, S/U grading*

LIN 591 Directed Readings

Students read and evaluate the literature on a topic of special academic interest or professional relevance under the direction of a faculty member.

*Prerequisite: Permission of instructor
Fall and spring, 1-3 credits, S/U grading
May be repeated for credit*

LIN 592 Directed Research

Students conduct research on a topic of special academic interest or professional relevance under the direction of a faculty member.

*Prerequisite: Permission of instructor
Fall and spring, 1-3 credits, S/U grading
May be repeated for credit*

LIN 621 Syntax II

A detailed consideration of recent developments in syntactic theory, including treatments of constituency and word order, grammatical relations, typological variation and linguistic universals, and constraints on grammatical rules and representations.

*Prerequisite: LIN 521
Spring, 3 credits, ABCF grading*

LIN 623 Phonology II

A study of recent developments in phonological theory, with particular attention to non-linear models of phonological representation and constraint-based models.

*Prerequisite: LIN 523
Spring, 3 credits, ABCF grading*

LIN 624 Morphology and Word Formation

The internal structure of words and the place of the word in syntax, phonology, and the lexicon. A variety of analytical methods—distributional, experimental, and computational will be introduced.

*Prerequisite: LIN 521 and LIN 523
Fall or spring, 3 credits, ABCF grading*

LIN 625 Semantics

An investigation of the role of semantics (the theory of meaning) in the overall theory of grammar, structured around such topics as formal semantics, the interaction of syntax and semantics, and lexical semantics.

*Prerequisite: LIN 521
Fall, 3 credits, ABCF grading*

LIN 650 Doctoral Seminar: Selected Topics

Topics will be announced each semester. The course may be repeated for credit if topic differs.

*Fall or spring, 0-3 credits, ABCF grading
May be repeated for credit*

LIN 651 Syntax Seminar

Topic varies and relates to current issues in the field and research activities of faculty and students. Past topics have included A-dependencies, adjectival and adverbial modification, word order and antisymmetry.

*Fall or spring, 0-3 credits, ABCF grading
May be repeated for credit*

LIN 653 Phonology Seminar

Topic varies and relates to current issues in

the field and research activities of faculty and students. Past topics have included interface issues (phonetics, morphology, syntax), functional motivations for phonological constraints (articulatory ease, perceptual salience, parsing considerations), intonation, and second language and loanword phonology.

*Fall or spring, 0-3 credits, ABCF grading
May be repeated for credit*

LIN 680 Qualifying Paper Workshop

Doctoral candidates will present and discuss their own research work.

*Fall or spring, 1-3 credits, S/U grading
May be repeated for credit*

LIN 698 Graduate Practicum in Teaching

May be repeated for credit

LIN 699 Dissertation Research on Campus

Independent research for the Ph.D. degree.

*Prerequisite: Open only to candidates for the Ph.D. degree who have advanced to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab
Fall, spring, and summer, 1-9 credits, S/U grading*

May be repeated for credit

LIN 700 Dissertation Research off Campus—Domestic

*Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading*

May be repeated for credit

LIN 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

*Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

LIN 800 Summer Research

May be repeated for credit

ESL Courses listed below are offered by the Linguistics Department, but are not part of the Master's or Ph.D. program.

ESL 591 Intermediate Oral/Aural Skills Class

The purpose of this course is to do intensive work in aural and oral language skills. Emphasis is on the segmental level: vowel/consonant work, syllable work and word stress as well as rhythm on the sentence level. Summarizing and questioning are practiced with work on learning styles. Students' awareness of American teaching and cultural patterns are stressed. Observing American professors and students in class is encouraged. A student will receive a diagnostic assessment of her/his language segmental and suprasegmental difficulties from the instructor and will be expected to work on improvement in these speech areas both in the classroom and independently in the language laboratories. Successful completion (A- or higher) of the course leads to ESL 598; B+ or below leads to ESL 596.

*Prerequisite: SPEAK Test score of 40-44
3 credits, ABCF grading*

ESL 593 Advanced Composition

Advanced training in writing for ESL students who need to concentrate on paragraph development. The first half of the semester deals with paragraph construction, stressing concepts of the main thesis and supporting arguments. Some advanced grammar is reviewed, but the assumption is that basic structures and mechanics of writing have already been mastered. The second half of the semester stresses combining paragraphs into short compositions. Both descriptive and argumentative writing are practiced. Diagnostic test during first week of classes determines placement in the course. A through C/Unsatisfactory grading only.

3 credits, ABCF grading

ESL 596 High Intermediate Oral/Aural Skills Class

The emphasis of this course is threefold: developing language skills, teaching skills and cultural awareness. Language skills will focus on sentence stress, phrasing, linking and pausing with field specific language practice. Teaching skills stressed include questioning techniques for discussion and assessment, leading effective discussions and assessing student learning. The cultural awareness focuses on idioms, American cultural values and norms as well as non-verbal communication. Successful completion of this course (B or higher) leads to ESL 598.

*Prerequisites: SPEAK Test score of 45-49
or B+ or higher in ESL 591
3 credits, ABCF grading*

ESL 598 Advanced Oral Aural

An advanced course in speaking and listening skills for non-native speakers of English. Work is done with individual problem sounds, stress, and intonation in order to help students modify their accents and make their speech more intelligible. Techniques of speaking before a group are taught to enable non-native speakers to feel more confident in participating in their other classes. Advanced work in American idioms and grammar is usually included. Language laboratory may be required by individual instructors. Especially useful for undergraduate and graduate students who need to make seminar presentation and for graduate students with teaching assistantships.

*Prerequisite: TSE or SPEAK score of 50 or higher or completion of ESL 591 or ESL 596 with a grade of B or higher
3 credits, ABCF grading*

Marine Sciences Research Center (MAS)

Dean: David O. Conover, Endeavour Hall 145 (631) 632-8700

Graduate Program Director: Glenn Lopez, Dana Hall 111 (631) 632-8660

Coordinator of Atmospheric Sciences Program: Sultan Hameed, Endeavour Hall 131 (631) 632-8681

Director of Waste Reduction and Management Program: R. Lawrence Swanson, Dutchess Hall 147 (631) 632-8704

Staff Assistant: Carol Dovi, Endeavour Hall 105 (631) 632-8681

Degrees awarded: Graduate Certificate in Oceanic Science; Graduate Certificate in Waste Management; M.S. and Ph.D. in Marine and Atmospheric Science

The Marine Sciences Research Center (MSRC) is the center for research, graduate education, and public service in the marine sciences for the entire State University of New York system. It is also the center for study in Atmospheric Sciences at Stony Brook. It offers the only SUNY graduate degree programs in oceanography. MSRC has programs of research in biological, chemical, geological, and physical oceanography; coastal zone management; fisheries ecology; and atmospheric sciences. MSRC scientists have a strong commitment to translate the results of research into forms readily usable for management and, when possible, into solutions to environmental problems. Emphasis in the research, educational, and public service programs is on the coastal ocean.

MSRC is situated ideally for studies of a variety of coastal environments including estuaries, lagoons, salt marshes, barrier islands, and continental shelf waters. Long Island has a greater diversity of coastal environments in a limited geographical range than any other comparable area in the United States. The proximity of New York City and the burgeoning population of Long Island and Connecticut make New York coastal waters an excellent laboratory for evaluating conventional methods of pollution abatement and coastal zone management. They also present an exciting and demanding challenge to the most imaginative and innovative scientists and planners to develop more effective ways of accommodating multiple and conflicting uses of these valuable natural resources with predictable and acceptable impacts.

MSRC offers M.S. and Ph.D. degree programs in Marine and Atmospheric Sciences with concentrations in both oceanography and atmospheric sciences. Following are detailed descrip-

tions of the two programs. Interested students should address inquiries to the graduate program director.

Facilities

The main laboratories and offices of MSRC are housed in a cluster of buildings with more than 8,000 square meters of usable floor space. Laboratories are well equipped for most analyses, and students and faculty have access, with special arrangements, to nearby Brookhaven National Laboratory and Cold Spring Harbor Laboratory. Center and University computing facilities are excellent. MASIC (the Marine and Atmospheric Sciences and Information Center) is the branch of the campus library system located at the Marine Sciences Research Center. Officially designated as a prototype for technology-based branch libraries on the campus, MASIC offers students and faculty a core collection of journals and monographs relevant to the multi-disciplinary pursuits of the Marine Sciences Research Center and its affiliated institutes.

MSRC manages Flax Pond, a 0.6-square kilometer salt marsh, located approximately seven kilometers from campus. Flax Pond is surrounded by large estates and has retained a relatively pristine character. Approximately three-fourths of the marsh has been set aside for research and education, and activities that compete with research are prohibited. MSRC has a well-equipped laboratory with a continuous seawater system. Laboratory and sea-table space are available to MSRC faculty and students.

The center operates the R/V Seawolf, a 24-meter research vessel designed specifically for oceanographic research. It is ideally suited for extended research trips, large-scale oceanographic sampling, and trawling. MSRC also maintains several other boats at Stony Brook and at the Southampton facility.

Graduate Program in Atmospheric Sciences

The Institute for Terrestrial and Planetary Atmospheres (ITPA) coordinates a teaching and research concentration for students interested in the physics and chemistry of the atmospheres of the Earth and other planets. Faculty research interests are described under "Faculty."

Climate Modeling

Studies in climate modeling focus on the influence of man on the terrestrial climate. In particular, ongoing research programs deal with the impact of increasing levels of atmospheric carbon dioxide and other trace gases upon the Earth's climate.

Atmospheric Chemistry

Experimental research is carried out using remote sensing techniques to measure stratospheric ozone and the chemicals that catalyze its destruction. Mass spectroscopic measurements of the abundance of stable isotopes of atmospheric gases, including methane and carbon dioxide, are carried out to obtain better estimates of their sources and sinks. Measurements of stratospheric composition and dynamics by NASA's Upper Atmospheric Research Satellite are analyzed.

Planetary Studies

Research is being carried out in collaboration with NASA's planetary probes with focus on Venus and the outer planets. Infrared measurements of molecules of planetary interest are performed in a spectroscopy laboratory.

Computing facilities consist of workstations linked to the supercomputers at Lawrence Livermore National Laboratory and the National Center for Atmospheric Research. The spectroscopy laboratories are equipped with infrared spectrometers, a tunable laser spectrometer, and a Fourier-transform spectrometer.

Graduate Certificate Program of the Waste Reduction and Management Institute

The Center is the home of the Waste Reduction and Management Institute (WRMI), dedicated to lessening the impacts of a complex array of wastes through research, environmental assessment, public outreach, and policy analysis. The faculty associated with the WRMI pursue research in marine chemistry, physics, and biology applied to a wide range of environmental and ecological problems as well as policy, regulatory, and management issues. The WRMI allows graduate students to have the opportunity to concentrate on issues related to waste management. A Graduate Certificate in Waste Management is administered by the School of Professional Development. The 18-credit program provides access to the most current expertise in waste management essential to working effectively in professional careers or public service. The certificate may also be incorporated into the degree of Professional Studies with a concentration in waste management. For further information refer to the School of Professional Development section in this bulletin.

Advanced Graduate Certificate Program in Oceanic Science

The advanced graduate certificate program in Oceanic Science is designed to make the unique resources of the MSRC available to professionals as well as to scholars both within the SUNY system and at other institutions as well as other professionals. Students admitted to this program complete two full-time semesters (18 credits) of intensive, specialized graduate studies in our core curriculum, or the equivalent, under the supervision of a faculty sponsor. The program is intended to supplement a student's primary educational and professional goals. Qualified students are provided with a broad background in oceanography as well as opportunity for in-depth course work in highly specialized topics.

The M.S. Program in Marine and Atmospheric Science

The M.S. program offered by MSRC consists of a rigorous interdisciplinary approach to oceanography. It is designed to prepare students for positions in research, management, environmental

protection, and resource development. The program provides students with a firm basis for more advanced study. But, more importantly, it is designed to equip students with the background and tools needed for effective careers without additional training. Students may specialize in any one of the following areas: biological oceanography, chemical oceanography, geological oceanography, physical oceanography, fisheries ecology, coastal zone management, marine environmental sciences, or atmospheric science.

Ph.D. Program in Marine and Atmospheric Science

The Ph.D. program is designed to prepare students to identify and attack oceanographic and atmospheric problems. It builds on a flexible, interdisciplinary program and offers students the opportunity to extend their command of the tools of scholarship and to improve their judgment so that they may become effective, independent problem solvers. Students will be free to emphasize their own interests in marine or atmospheric sciences, but they are expected to acquire a broad base of interdisciplinary knowledge. Successful research requires both a profound knowledge of at least one basic science and a general understanding of the processes that characterize the coastal ocean. Current directions of faculty research include:

Biological Oceanography

Ongoing research spans all levels of biological activity from molecules to ecosystems. MSRC faculty continue to provide major discoveries on marine pelagic ecosystems from coastal bays to the Antarctic waters. Plankton biology, adaptation of benthic organisms, biofilms, contaminant cycling, and biological impacts are some important research areas.

Marine Geochemistry

Biogeochemical studies emphasized at the MSRC are process-orientated or mechanistically oriented although substantial effort is also devoted to environmental pollution. The MSRC faculty are at the forefront of large international programs dedicated to the study of global-scale, geochemical cycling, as well as multidisciplinary programs to study the transport and fate of contaminants in the marine environment.

Geological Oceanography

Faculty in geological oceanography are conducting fundamental research in sedimentation processes, sedimentary environments, and the development of strata. We have also pursued applications of geological principles to environmental problems dealing with contaminated sediments, dredging and sea floor mining, and shore erosion.

Physical Oceanography

Physical oceanographers concentrate on the coastal ocean, particularly the inner shelf and estuaries. While vigorously pursuing fundamental research in coastal processes, we have also been effective applying research results to the solution of problems that arise from society's uses of the coastal ocean. Both observational and modeling approaches are used extensively in a complementary fashion.

Fisheries Biology

A wide variety of fisheries research is directed at an understanding of the factors controlling fishery stocks. Research topics include larval transport, habitats, mortality, predator-prey interactions, and genetic adaptations.

Admission

M.S. Program in Marine and Atmospheric Science and the Graduate Certificate Program in Oceanic Sciences

For admission to the graduate program in Marine and Atmospheric Sciences, the following, in addition to the minimum Graduate School requirements, are normally required:

- A. B.A. or B.S. degree;
- B. Coursework in mathematics through calculus, physics, and introductory courses in at least two of the following areas: chemistry, biology, and earth sciences, with advanced work in at least one of these areas;
- C. Cumulative grade point average of at least 3.0 (B);
- D. Acceptable scores on the Graduate Record Examination (GRE) General Test;
- E. Acceptable scores (600) on the TOEFL for foreign students;
- F. Three letters of recommendation;
- G. Official transcript(s);

H. Acceptance by the Marine Sciences Research Center and Graduate School.

Ph.D. Program in Marine and Atmospheric Science

There are two tracks in the Ph.D. program—one in Oceanography and one in Atmospheric Sciences. For admission to the graduate program in Marine and Atmospheric Science, the following, in addition to the minimum requirements of the Graduate School, are normally required:

A. Applicants for the Oceanography track should have a B.S. or M.S. degree in biology, chemistry, physics, geology, or other suitable science discipline.

Students who transfer either must demonstrate, by examination, mastery of the material in the MSRC core courses (MAR 501, 502, 503, and 506 for the Oceanography concentration, or MAR 544, 593, 594, and 596 for the Atmospheric Sciences concentration) or must take these courses;

B. Applicants for the Atmospheric Sciences track must have a B.S. in atmospheric sciences, physics, chemistry, or other appropriate discipline;

C. Acceptable scores on the Graduate Record Examination (GRE) General Test;

D. Acceptable scores (600) on TOEFL for foreign students;

E. Three letters of recommendation;

F. Official transcript(s);

G. Acceptance by both the Marine Sciences Research Center and the Graduate School.

MSRC Faculty

Distinguished Professor and Distinguished Service Professor

Cess, Robert D., Ph.D., 1959, University of Pittsburgh: Atmospheric sciences.

Distinguished Professors

Aller, Robert C., Ph.D., 1977, Yale University: Marine geochemistry; marine animal-sediment relations.

Lee, Cindy, Ph.D., 1975, University of California, San Diego (Scripps): Marine geochemistry of organic compounds; organic and inorganic nitrogen cycle biochemistry.

Professors

Aller, Josephine Y., Ph.D., 1975, University of Southern California: Marine benthic ecology; invertebrate zoology; marine microbiology; biogeochemistry.

Bokuniewicz, Henry J., Ph.D., 1976, Yale University: Nearshore transport processes; coastal sedimentation; marine geophysics.

Bowman, M.J., Ph.D., 1971, University of Saskatchewan, Canada: Coastal dynamics; oceanic fronts; productivity and physical processes.

Cochran, J. Kirk, Ph.D., 1979, Yale University: Marine geochemistry; use of radionuclides as geochemical tracers; diagenesis of marine sediments.

Conover, David O., Ph.D., 1981, University of Massachusetts: Ecology of fishes; fisheries biology.

Fisher, Nicholas S., Ph.D., 1974, Stony Brook University: Marine phytoplankton physiology and ecology; biochemistry of metals; marine pollution.

Flood, Roger D., Ph.D., 1978, Massachusetts Institute of Technology, Woods Hole Oceanographic Institution: Marine geology; sediment dynamics; continental margin sedimentation.

Geller, Marvin A., Ph.D., 1969, Massachusetts Institute of Technology: Atmospheric dynamics; climate and the upper atmosphere.

Hameed, Sultan, *Coordinator of Atmospheric Sciences Program*. Ph.D., 1968, University of Manchester, England: Atmospheric sciences.

Lopez, Glenn R., *Graduate Program Director*. Ph.D., 1976, Stony Brook University: Benthic ecology; animal-sediment interactions.

Mattice Jack, Ph.D., 1971, Syracuse University: Invertebrate zoology; physiological ecology; population biology; aquatic toxicology.

Scranton, Mary I., Ph.D., 1977, Massachusetts Institute of Technology, Woods Hole Oceanographic Institution: Marine biogeochemistry; geochemistry of reduced gases; chemical cycling in anoxic systems.

Swanson, R. Lawrence, Ph.D., 1971, Oregon State University: Physical oceanography of coastal waters and estuaries; ocean dumping; coastal zone management.

Taylor, Gordon T., Ph.D., 1983, University of Southern California: Marine microbial ecology; microbial mediation of biogeochemical processes; biofouling.

Varanasi, Prasad, Ph.D., 1967, University of California, San Diego: Atmospheric spectroscopy; remote sensing; global warming.

Wang, Dong-Ping, Ph.D., 1975, University of Miami: Coastal ocean dynamics.

Weyl, Peter K., *Emeritus*. Ph.D., 1953, University of Chicago: Coastal zone planning; physical oceanography.

Woodhead, Peter M.J., B.S., 1953, Durham University, England: Behavior and physiology of fish; coral reef ecology; ocean energy-conversion systems.

Zhang, Minghua, Ph.D., 1987, Institute for Atmospheric Physics, Academia Sinica, Beijing: Atmospheric sciences; modeling of climate.

Associate Professors

Armstrong, Robert A., Ph.D., 1975, University of Minnesota: Marine ecosystem ecology; marine biogeochemistry; population and community ecology.

Brownawell, Bruce J., Ph.D., 1986, Massachusetts Institute of Technology, Woods Hole Oceanographic Institution: Biogeochemistry of organic pollutants in seawater and groundwater.

Cerrato, Robert M., Ph.D., 1980, Yale University: Benthic ecology; population and community dynamics; recolonization.

Chang, Edmund K.M., Ph.D., 1993, Princeton University: Atmospheric dynamics and diagnoses climate dynamics; synoptic meteorology.

Colle, Brian A., Ph.D., 1997, University of Washington: Synoptic meteorology; mesoscale numerical modeling and forecasting; coastal meteorology.

Gobler, Christopher, Ph.D., 1999, Stony Brook University: Phytoplankton; harmful algal blooms; estuarine ecology; aquatic biogeochemistry.

Lonsdale, Darcy J., Ph.D., 1979, University of Maryland: Zooplankton ecology with special interest in physiology; life history studies.

Lwiza, Kamazima M.M., Ph.D., 1990, University of Wales: Structure and dynamics of shelf seas.

Mak, John E., Ph.D., 1992, University of California, San Diego (Scripps): Atmospheric chemistry and biosphere-atmosphere interactions; isotope geochemistry.

McElroy, Anne E., Ph.D., 1985, Massachusetts Institute of Technology, Woods Hole Oceanographic Institution: Aquatic toxicity, fate and effects of organic contaminants.

Piontkovski, Sergey, Ph.D., 1978, Institute of Biology of the Southern Seas, Ukraine: Physical-biological coupling in coastal and oceanic ecosystems; spatial-temporal structure of marine plankton communities.

Sanudo-Wilhelmy, Sergio A., Ph.D., 1993, University of California, Santa Cruz: Chemical oceanography; coastal geochemistry; metal cycling in aquatic systems.

Wilson, Robert E., Ph.D., 1973, Johns Hopkins University: Estuarine and coastal ocean dynamics.

Wurster, Charles F., *Emeritus*. Ph.D., 1957, Stanford University: Effects of chlorinated hydrocarbons on phytoplankton communities.

Assistant Professors

Allam, Bassem, Ph.D., 1998, University of Western Brittany: Diseases of shellfish.

Baines, Stephen, Ph.D., 1993, Yale University: Aquatic biogeochemistry of carbon and trace elements.

Collier, Jackie L., Ph.D., 1994, Stanford University: Phytoplankton physiology and ecology; freshwater and marine plankton; molecular microbial ecology.

Dove, Alistair, Ph.D., 1999, University of Queensland: Parasites and diseases of marine organisms.

Frisk, Michael, Ph.D., 2004, University of Maryland: Biology; life history; conservation of elasmobranchs.

Kuznetsova, Marina R., Ph.D., 1993, Moscow State University: Organic chemistry and microbiology of the sea surface microlayer and marine aerosols.

Munch, Stephen, Ph.D., 2002, Stony Brook University: Evolutionary ecology of growth and life history traits; evolution in harvested populations; applied population dynamics modeling; mathematical modeling and statistics.

Peterson, Bradley, Ph.D., 1998, University of South Alabama: Community ecology of sea-grass dominated ecosystems.

Riemer, Nicole, Ph.D., 2002, University of Karlsruhe, Germany: Cloud microphysics; aerosol physics and chemistry.

Warren, Joseph, Ph.D., 2001, Massachusetts Institute of Technology and Woods Hole Oceanographic Institution: Acoustical oceanography; zooplankton behavior and ecology.

Lecturer

Roethel, Frank J., Ph.D., 1982, Stony Brook University: Environmental chemistry; behavior of coal waste in the environment; solution chemistry.

MSRC Graduate Program Faculty

Distinguished Professors

Herman, Herbert, *Emeritus*. Ph.D., 1961, Northeastern University: Ocean engineering; undersea vehicles; marine materials.

Levinton, Jeffrey, Ph.D., 1971, Yale University: Marine ecology.

Professors

Bowser, Paul, *Adjunct*. Ph.D., 1978, Auburn University: Fish pathology.

De Zafra, Robert, *Emeritus*. Ph.D., 1958, University of Maryland: Positron annihilation.

Ferson, Scott, *Adjunct*. Ph.D., 1988, Stony Brook University: Risk assessments and uncertainty analysis.

Fowler, Scott, *Adjunct*. Ph.D., 1969: Zooplankton ecology; biogeochemistry of metals; marine pollution; radioecology; ecotoxicology.

Lerdau, Manuel, Ph.D., 1994, Stanford University: Plant physiology and ecology; atmospheric chemistry.

Koppelman, Lee E., Ph.D., 1970, Cornell University: Coastal zone management; planning; policy studies.

Safina, Carl, *Adjunct*. Ph.D., 1987, Rutgers University: Marine vertebrates; fisheries policy; raising awareness of ocean change.

Slobodkin, Lawrence B., *Emeritus*. Ph.D., 1951, Yale University: Evolutionary strategy with reference to species diversity; timing of responses and self-image adaptive mechanisms of Hydra.

Stefano, George, *Adjunct*. Ph.D., Marine animals; estrogen and opioid-opiate processes; immune responses.

Associate Professors

Chistoserdov, Andre Y., *Adjunct*. Ph.D., 1985, Institute of Genetics and Selection of Industrial Microorganisms, Russia: Marine microbiology; molecular genetics of methylotrophic bacteria; marine biotechnology and bioremediation.

Goodbred Jr., Steven, *Adjunct*. Ph.D., 1999. Coastal and marine sedimentology; quaternary development of continental margins; salt-marsh processes and responses.

Greene, William, M.D., 1968, State University of New York, Downstate Medical: Infectious diseases.

Padilla, Diana, Ph.D., 1987, University of Alberta: Mollusc ecology; invasive species.

Reaven, Sheldon, Ph.D., 1975, University of California, Berkeley: Energy and environmental problems; waste management; science and society.

Waliser, Duane, *Adjunct*. Ph.D., 1992. Ocean-atmosphere interactions; tropical climate dynamics.

Assistant Professors

Buonaiuto, Frank, *Adjunct*. Ph.D., 1999, Stony Brook University: Coastal processes; numerical modeling of waves; tides and sediment transport.

Essington, Tim, *Adjunct*. Ph.D., 1999, University of Wisconsin-Madison: Marine fish ecology and biology; food web interactions; marine fisheries.

Research Scientist

Flagg, Charles, Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution: Structure and dynamics of coastal oceans.

Lecturers

Cahill, Michael, *Adjunct*. Application and development of environmental law in local government.

Hill, Douglas, *Adjunct*. Eng.Sc.D, Columbia University: Energy; climate change mitigation and adaptation.

Tanski, Jay, M.S., 1981, Stony Brook University: Coastal erosion processes and management; GIS applications for coastal management.

Degree Requirements Requirements for the M.S. Degree in Marine and Atmospheric Science

In addition to the minimum Graduate School requirements, the following are required:

A. An overall B (3.0) average in the required core courses (MAR 501 Physical Oceanography, MAR 502 Biological Oceanography, MAR 503

Chemical Oceanography, and MAR 506 Geological Oceanography) with no grade lower than a C. Any student who receives two C's that have not been offset by two A's will not be allowed to register for the following semester and may be asked to leave the program;

B. Seminar MAR 580 (two semesters);

C. An advisor by the end of the first year (for students in the Oceanography concentration);

D. Master's research proposal due by end of first year, signed by advisor and two readers;

E. A minimum of six credits in specialty courses (excluding MAR 501, 502, 503, 506, 547, 555, and 580) selected by the student and his or her advisor and approved by the advisor;

F. Sea experience or appropriate field experience;

G. Oral presentation of thesis work;

H. Submission of approved thesis.

Requirements for Ph.D. Degree in Marine and Atmospheric Science

In addition to the minimum Graduate School requirements, the following are required:

A. Comprehensive Examination: The primary purposes of the Comprehensive Examination are to assess the student's knowledge of his or her field and the student's ability to relate his or her specific research interests to the broader field. The student must demonstrate a general knowledge of oceanography or atmospheric sciences, including an understanding of the current concepts of his or her field. Success on the examination implies the ability to use this information to address questions of a multidisciplinary nature;

B. Ph.D. degree dissertation proposal approved by a dissertation committee;

C. Sea experience or appropriate field experience for students in the oceanography concentration;

D. Seminar MAR 580 (2 semesters);

E. An advisor by the end of the first year;

F. Practicum in teaching;

G. Oral qualifying examination;

H. Formal advancement to candidacy;

I. Oral defense of dissertation;

J. Submission of approved dissertation;

K. Residency. Normally at least two consecutive semesters of full-time study.

Courses

Marine Science Courses

MAR 501 Physical Oceanography

Examines physics of ocean circulation and mixing on various scales with strong emphasis on profound effects of Earth's rotation on motions and distribution of properties. An introduction to physics of estuaries and other coastal water bodies.

Fall, 3 credits, ABCF grading

MAR 502 Biological Oceanography

Examines biological processes in the ocean, and introduces major ocean biomes and groups of organisms. A broad treatment of energy and nutrient cycling in coastal and open ocean environments.

Fall, 3 credits, ABCF grading

MAR 503 Chemical Oceanography

Introduction to chemical oceanography. Topics include origin and history of seawater, major and minor constituents, dissolved gases, the carbon dioxide system, distribution of properties in the world ocean, isotope geochemistry, and estuarine and hydrothermal vent geochemistry.

Spring, 3 credits, ABCF grading

MAR 506 Geological Oceanography

An introduction to the geological oceanography of the world ocean with emphasis on the coastal environment; discussions of the physical processes controlling the structure and evolution of the ocean basins and continental margins, the distribution of marine sediment, and the development of coastal features.

Spring, 3 credits, ABCF grading

MAR 507 History of Waste Management

Survey of waste management problems from the earliest times until today. The development and evolution of methodologies for dealing with the human waste stream are discussed, especially in the context of urban/suburban and coastal communities. Implications for future approaches will be considered.

Fall, 3 credits, ABCF grading

MAR 508 Pollution Monitoring

The theory and practice of monitoring waste quality and pollution in marine environments is discussed. Case studies are used to examine the types of measurements used and how the results are analyzed and applied to management decisions. Methods of quality control and establishment of a database for determining long-term trends.

Spring, 3 credits, ABCF grading

MAR 510 Modeling Techniques in Chemical Oceanography

Derivation of solutions to advection-diffusion-reaction equations for marine sediments and waters. One- and multi-dimensional models are developed for dissolved and solid-phase substances in cartesian, cylindrical, and spherical coordinates. Effect of imposing multiple layers on these systems is examined.

Spring, 3 credits, ABCF grading

MAR 511 Behavioral Ecology

Ecology, evolution, and physiology of the behavior of animals that live in water; from microscale biophysical interactions in zooplankters to interspecific interactions among predators and prey. Emphasis is placed on the influence of physical and chemical characteristics of the aquatic environment on animal behavior. Topics include fluid mechanics, biomechanics, sensory biology, endogenous rhythms, reproduction, migration, dispersal, and foraging.

Fall, alternate years, 3 credits, ABCF grading

MAR 512 Marine Pollution

Review of the physical and chemical characteristics and speciation in the marine environment of organic pollutants, metals and radionuclides including bioavailability, assimilation by marine organisms, toxicity, and policy issues. Co-scheduled as MAR 512 or HPH 671.

Fall, 3 credits, ABCF grading

MAR 513 Numerical Models of Coastal Processes

Fundamentals and applications of numerical models of surf zone dynamics, sediment transport, beach and inlet processes.

Fall, 3 credits, ABCF grading

MAR 514 Marine Management

The course discusses waste management issues particularly affecting the marine environment. Topics include ocean dumping, sewage treatment fish kills, beach pollution, and nuisance algal blooms. Techniques for managing the waste stream are presented.

Spring, 3 credits, ABCF grading

MAR 515 Phytoplankton Ecology

The biology and ecology of marine phytoplankton. Covered are life cycles, growth, nutrient uptake, grazing, and the effects of environmental factors on growth and survival of phytoplankton. The characteristics of various classes are examined and are related to environmental conditions.

Fall, 3 credits, ABCF grading

MAR 516 Larval Ecology

This course examines (1) physical, chemical, and biological processes that regulate timing of reproduction, larval dispersal, and larval settlement, (2) selective forces in the plankton that shape life histories, and (3) ecological and evolutionary consequences of complex life cycles.

Spring, 3 credits, ABCF grading

MAR 517 Emerging Technology

The course examines various emerging techniques for solid waste management including incineration systems, landfill systems, composting technology, and transfer stations as well as waste reduction and recycling strategies. Case histories are provided and atmospheric and aquatic impacts are discussed.

Spring, 3 credits, ABCF grading

MAR 518 Environmental Engineering

A technical, legal, and regulatory review of various aspects of environmental engineering. Problems of and solutions for managing water resources and air quality in an urban/suburban coastal environment are discussed.

Spring, 3 credits, ABCF grading

MAR 519 Geochemistry Seminar

This course explores topics in low-temperature geochemistry as chosen by the instructors and participants. The seminar series is organized around a theme such as early diagenesis, estuarine geochemistry, or aquatic chemistry. Students are required to lead one of the seminars and to participate in discussions.

Fall, 1 credit, ABCF grading

May be repeated for credit

MAR 520 New Production and Geochemical Cycles

Consideration of oceanic new production for a variety of ecosystems. Quantitative examination of the impact of new production on the transport and cycling of major and minor elements and pollutants.

Spring, alternate years, 2 credits,

ABCF grading

MAR 521 Groundwater Problems

Discussion of the hydraulic processes and technologies that are central to the management and monitoring of groundwater resources including special problems of coastal hydrology and saltwater intrusion, as well as the fate of contaminants. Remediation approaches are also examined. Co-scheduled as MAR 521 or HPH 673.

Prerequisite: Permission of instructor

Summer, 3 credits, ABCF grading

MAR 522 Environmental Toxicology

The ecological and human health effects of toxic chemicals, especially chlorinated hydrocarbons, are examined. Toxicological principles, carcinogenesis, and economic and political considerations are included. Co-scheduled as MAR 522 or HPH 674.

Spring, alternate years, 3 credits,

ABCF grading

MAR 523 Molecular Biological Methods in Marine Research

This course is designed for students interested in using molecular biological methods in oceanography and ecology. Modern molecular methods which are widely used to address ecological, evolutionary, and systematics questions will be discussed and include; environmental probing (DNA-DNA hybridization), polymerase chain reaction (PCR), "fingerprinting" of individual organisms using random fragment length polymorphism (RFLP) method, analysis of microbial populations using denaturing gradient gel electrophoresis (DGGE), phospholipid fatty acid composition analysis (PLFA), and immunological methods including enzyme-linked immunosorbent assay (ELISA).

Spring, 3 credits, ABCF grading

MAR 524 Organic Contaminant Hydrology

There are a host of chemical, biological, and physical processes that affect the transport and fate of organic chemicals in natural waters. This course concerns understanding these processes and the structure-activity relationships available for predicting their rates. The major focus of this class is on contaminant hydrology of soil and aquifer environments, and includes the principles behind remediation and containment technologies. This course is offered as both MAR 524 and GEO 524.

Spring, 3 credits, ABCF grading

MAR 525 Environment and Public Health

Review of the interactions of humans with the atmosphere and water resources, especially in the Long Island coastal community. An introduction is provided to the field of environmental health and the practices relevant to an urban/suburban and coastal setting. Co-scheduled as MAR 525 or HPH 675.

Spring, 3 credits, ABCF grading

MAR 526 Pollutant Responses**MAR 527 Global Change**

The course examines the scientific basis behind questions of global change and some of the policy implications of changes to the region and country. Topics include evidence and courses of past climatic changes, greenhouse gases and the greenhouse effect, analogues with other planets, the Gaia hypothesis, climate modeling, and deforestation and the depletion of ozone.

Fall, alternate years, 2 credits, ABCF grading

MAR 528 Ocean Atmosphere Interactions

This course discusses the fundamental physical mechanisms through which the ocean and atmosphere interact. These principles are applied to the understanding of phenomena, such as the El Niño Southern Oscillation, the effects of sea surface temperature on the distribution of low-level winds and development of tropical deep convection, and the effects of tropical deep convection and mid-latitude storms on the ocean's mixed layer. Both modeling and observational aspects are discussed. Material will be taken from selected textbooks, as well as recent literature.

Spring, alternate years, 3 credits, ABCF grading

MAR 529 Isotope Geochemistry

This course deals both with the use of radio- and stable isotope applications to the earth sciences.

Fall, 3 credits, ABCF grading

MAR 530 Organic Geochemistry

Introduction to the organic chemistry of the earth, oceans, and atmosphere. Topics include production transformation and fate of organic matter; use of organic biomarkers and stable and radioisotopes; diagenesis in recent sediments; oil and coal production and composition; dissolved and particulate organic matter in seawater.

Fall, alternate years, 3 credits, ABCF grading

MAR 531 Regional Planning Applied to Marine Sciences

This course will introduce the theories, techniques, and literature of regional planning with special emphasis on planning as a decision-making tool related to the marine environment.

Fall, alternate years, 3 credits, ABCF grading

MAR 532 Global Biogeochemistry of Greenhouse Gases

The role of the land, the ocean, and the atmosphere in controlling the atmospheric content of greenhouse gases. Topics vary depending on interest but may include subjects such as aerosols, DMS and cloud condensation nuclei, the global cycles of methane, nitrous oxide and carbon monoxide, and the role of biota in

regulating gas concentrations.

Spring, alternate years, 2 credits, ABCF grading

MAR 533 Instrumental Analysis

Fundamental principles of instrumental chemical analysis and practical applications of molecular spectroscopy and atomic spectroscopy. These two instruments are widely used in environmental problem solving. Lectures cover basic concepts of chemical analysis and the fundamental principles of the analytical techniques to be used. In the laboratory, students gain hands-on experience both by performing a series of required basic chemical determinations (nutrients and trace metals in sediments and in river water) and by undertaking special projects. Students prepare written reports describing the methods, the theory underlying those methods, results, and figures of merit. Students also present their results orally in brief presentations.

Spring, 3 credits, ABCF grading

MAR 534 Aquaculture

Biological, economic, practical, social, and legal aspects of culturing marine and freshwater organisms, including plants, mollusks, crustaceans, and finfish. Basic principles of aquaculture and successes and failures with selected species. Field trips and the preparation and evaluation of aquaculture proposals.

Fall, 2 credits, ABCF grading

MAR 535 Physiological Ecology of Marine Organisms

An introduction to the physiological adaptations of marine organisms to environmental changes. Specific topics covered include responses to stress, temperature adaptation, genetic basis of physiological adaptation, resource partitioning, bioenergetics, and feeding models and resource limitation.

Fall, 3 credits, ABCF grading

MAR 536 Environmental Law and Regulation

This course covers environmental law and regulations from inception in common law through statutory law and regulations. The initial approach entails the review of important case law giving rise to today's body of environmental regulations. Emphasis is on environmental statutes and regulations dealing with waterfront and coastal development and solid waste as well as New York State's Environmental Quality Review Act (SEQRA) and the National Environmental Policy Act (NEPA). Co-scheduled as MAR 536 or HPH 676.

Spring, 3 credits, ABCF grading

MAR 537 Primary Productivity in the Sea

Review of classic and current research on primary production by marine microalgae and macroalgae. Topics include photosynthesis and growth, nutrients, temporal and spatial variability, competition, and predation. Students carry out original research projects.

Fall, 3 credits, ABCF grading

MAR 538 Modern Methods of Data Analysis in Atmospheric and Ocean Sciences - Part I

An introduction to basic statistical concepts and their applications to analysis of data in atmospheric and marine sciences. The topics

include distribution, statistical estimation, hypothesis testing, analysis of variance, linear and nonlinear regression analysis, and basics of experimental design. In-depth class discussions of the theoretical concepts are accompanied by extensive applications to data sets supplied by the instructor and the students.

*Fall, alternate years, 3 credits, ABCF grading
May be repeated twice for credit*

MAR 539 Bioremediation

The microbial and chemical processes that control the feasibility and design of bioremediation systems for the control of hazardous and nonhazardous wastes. Topics include processes, pathways and kinetics of microbial transformations; design of microbial reactor and in situ technologies and application of computer models for optimization; methods for assessing effectiveness of bioremediation; and case studies.

Fall, alternate years, 3 credits, ABCF grading

MAR 540 Marine Microbial Ecology

An historical perspective of the field, aspects of nutrition and growth, microbial metabolism, and trophodynamic relationships with other organisms. Emphasis on roles of microorganisms in marine environments such as salt marshes, estuaries, coastal pelagic ecosystems, and the deep sea, as well as microbial contribution to geochemical cycles. Contemporary and classical methodologies covered.

Fall, 3 credits, ABCF grading

MAR 541 Diseases of Aquatic Organisms

This course is designed to expose students to fundamental and current issues pertaining to host/pathogen interactions in aquatic environment. By the end of the course, students should have a basic understanding of disease processes in aquatic animals; knowledge of the tools used for disease diagnosis; and an appreciation of disease management tools available today. A particular accent is given to the role of the environment as an important factor in infectious and non-infectious diseases.

Spring, every year, 3 credits, ABCF grading

MAR 544 Atmospheric Radiation

Discussion of the compositions and radiative components of planetary atmospheres. Blackbody and gaseous radiation with emphasis on the respective roles of electromagnetic theory and quantum statistics. Derivation of the equation of transfer and radiative exchange integrals, with application to energy transfer processes within the atmospheres of Earth and other planets.

Fall, alternate years, 3 credits, ABCF grading

MAR 545 Continental Margin Sedimentation

Examination of the sedimentary processes active across continental margins including coastal environments, shelf, slope, and rise.

Fall, alternate years, 3 credits, ABCF grading

MAR 546 Marine Sedimentology

Study of sedimentology in the marine environment including an introduction to fluid mechanics, sediment transport theory, quantitative models of sedimentation, and dynamic stratigraphy.

Fall, alternate years, 3 credits, ABCF grading

MAR 547 Oceanographic Problem Solving

Course gives students experience in integrating information from different disciplines to address important oceanographic problems. Sessions are structured around problems of current interest to marine scientists and involve active student participation in small working groups as well as short written essays to be critiqued by faculty.

Fall, 2 credits, ABCF grading

MAR 548 Marine Geophysics

Fundamentals of geophysics applied to the study of the oceans, ocean basins, and coastal zone dynamics including heat flow, seismology, gravity, magnetics, fluid mechanics, and flow in porous media.

Spring, alternate years, 3 credits, ABCF grading

MAR 549 Middle Atmosphere Dynamics

This course is concerned with the dynamics of the Earth's neutral atmosphere above the troposphere; that is, the stratosphere, mesosphere, and lower thermosphere. Observational information of the dynamics of the middle atmosphere is discussed, and theories of middle atmospheric motions are developed.

Fall, alternate years, 3 credits, ABCF grading

MAR 550 Topics in Marine Sciences

This is used to present special interest courses, including intensive short courses by visiting and adjunct faculty and courses requested by students. Those given in recent years include Nature of Marine Ecosystems, Science and Technology in Public Institutions, Plutonium in the Marine Environment, and Problems in Estuarine Sedimentation.

*Fall and spring, 1-4 credits, ABCF grading
May be repeated for credit*

MAR 551 Special Topics in Management

This course involves in-depth examination and assessment of one or two topical problems and issues in the management of fisheries in the mid-Atlantic region. Fisheries management encompasses a diversity of disciplines and interests: biology, ecology, mathematics, law, policy, economics, analytical modeling, sociology, and anthropology. The class conducts a detailed and thorough review of one or two key fisheries management problems that incorporate component issues spanning this range of disciplines. Students form several teams, each team focusing on one aspect of the overall problem and preparing a report detailing that aspect and making recommendations on how management decisions can be improved.

*Fall, 1-4 credits, ABCF grading
May be repeated for credit*

MAR 552 Directed Study

Individual studies under the guidance of a faculty member. Subject matter varies according to the needs of the students.

Fall, spring, and summer, 1-12 credits, ABCF grading

May be repeated for credit

MAR 553 Fishery Management

Survey of the basic principles of and techniques for studying the population dynamics of marine fish and shellfish. Discussion of

the theoretical basis for management of exploited fishes and shellfish, contrasting management in theory and in practice using local, national, and international examples. Includes lab exercises in the use of computer-based models for fish stock assessment.

Spring, alternate years, 3 credits, ABCF grading

MAR 554 Special Topic in Marine Disease

A graduate seminar that discusses topical research on diseases in the marine environment.

*Prerequisite: MAR 502
1-4 credits, ABCF grading
May be repeated for credit*

MAR 555 Introduction to Mathematics for Marine Scientists

Course is designed to develop quantitative thinking and approaches in marine sciences. Topics covered are differential equations, differential and integral calculus, (minimum) partial differential equations. Discussions include formulation of practical problems, i.e., application of differential equations.

Fall, 3 credits, ABCF grading

MAR 556 Biology of Fishes

Lectures and laboratories on comparative evolution, morphology, physiology, and ecology of fishes with emphasis on marine and estuarine forms.

Fall, alternate years, 3 credits, ABCF grading

MAR 557 Introduction to Risk Assessment and Risk Management

Risk assessment, the quantification of the degree of hazard resulting from human activities, is the device adopted by governmental agencies to establish the priorities of the hazards of our daily lives. This course will explore the science and assumptions on which risk assessment is based, the benefits it has generated, and the controversies surrounding its use. The use of risk assessment methods and the problems associated with risk communication will be studied, along with case studies. This course is offered as CEY 557, MAR 557, and HPH 677.

3 credits, ABCF grading

MAR 558 Remote Sensing

Theory and application of remote sensing and digital image analysis to marine research. Students use standard software and PCs for digital filtering, enhancement, and classification of imagery.

Fall, 2 credits, ABCF grading

MAR 559 Applied Groundwater Modeling

Instruction in the use of standard groundwater models including calibration, gridding, input parameters, sensitivity analysis and interpretation of results, case studies and hands-on applications.

Spring, 3 credits, ABCF grading

MAR 560 Ecology of Fishes

Introduction to current research in the ecology of fishes. Topics such as population regulation, migration, reproductive strategies, predator-prey interactions, feeding behavior, competition, life history strategies, and others are discussed.

Spring, alternate years, 3 credits, ABCF grading

MAR 562 Early Diagenesis of Marine Sediments

The course treats qualitative and quantitative aspects of the early diagenesis of sediments. Topics include diffusion and adsorption of dissolved species; organic matter decomposition and storage; and diagenesis of clay materials, sulfur compounds, and calcium carbonates. The effects of bioturbation on sediment diagenesis are also discussed. This course is offered as both MAR 562 and GEO 562.

Fall, alternate years, 3 credits, ABCF grading

MAR 563 Early Diagenesis of Marine Sediments II

The basic principles and concepts of diagenetic processes developed in MAR/GEO 562 are used to examine in detail early diagenesis in a range of sedimentary environments. These include terrigenous and biogenic sediments from estuarine, lagoonal, deltaic, open shelf, hemipelagic, oligotrophic deep-sea, and hydrothermal regions.

Prerequisite: MAR/GEO 562

MAR 564 Atmospheric Structure and Analysis

Real world applications of basic dynamical principles to develop a physical understanding of various weather phenomena. Topics include the hypsometric equation, structure and evolution of extratropical cyclones, fronts, hurricanes and convective systems, surface and upper air analysis techniques, radar and satellite interpretation, and introduction to operational products and forecasting.

Spring, 3 credits, ABCF grading

MAR 565 Global Atmospheric Change

An application of chemical principles to the analysis and prediction of climate changes on earth. The course analyzes climates that have occurred in the earth's past and uses this information to infer climate changes that are likely to occur in the near and distant future. Topics covered include atmospheric chemistry, paleoclimates, greenhouse warming, ozone changes and urban pollution.

Spring, 3 credits, ABCF grading

MAR 566 Air Pollution and Its Control

A detailed introduction to the causes, effects and control of air pollution. The pollutants discussed include carbon monoxide, sulfur oxides, nitrogen oxides, ozone, hydrocarbons, and particulate matter. The emissions of these bases from natural and industrial sources and the principles used for controlling the latter are described. The chemical and physical transformations of the pollutants in the atmosphere are investigated and the phenomena of urban smog and acid rain are discussed.

Spring, 3 credits, ABCF grading

MAR 568 Scientific Communication

This course is designed to provide first-year graduate students with an introduction to the standards and practices of proposing and pressing results of oceanographic research. Students will develop skills in communicating in oral and written formats, and have the opportunity to produce a draft thesis proposal.

Spring, 2 credits, ABCF grading

MAR 570 Modern Methods of Data Analysis in Atmospheric and Ocean Studies Part II

Sampling and experiment design considerations, time and frequency domain analysis, Fourier methods, related topics in probability and statistics. Course involves some computer work.

*Fall, alternate years, 3 credits, ABCF grading
May be repeated twice for credit*

MAR 571 Zooplankton Ecology

The course is designed to acquaint the student with the theoretical problems and applied methodology in ecological studies of marine and freshwater zooplankton. Topics will include taxonomy, anatomy, physiology, life history strategies, population dynamics, and food chain interaction.

*Spring, alternate years, 3 credits,
ABCF grading*

MAR 572 Geophysical Simulation

Basic equations and boundary conditions. Linear and nonlinear instabilities. Finite-difference and time integration techniques for problems in geophysical fluid dynamics. Numerical design of global atmospheric and ocean models.

Fall, alternate years, 3 credits, ABCF grading

MAR 573 Special Topics: Chemical Oceanography

This course is designed for the discussion of topics of special interest on demand that are not covered in regularly scheduled courses. Examples of possible topics include carbonate chemistry, isotope chemistry, and microbial chemistry.

*Spring, 1-4 credits, ABCF grading
May be repeated for credit*

MAR 574 Special Topics: Ocean Dynamics

Introductory dynamical oceanography, framework, and applications.

*Spring, 1-4 credits, ABCF grading
May be repeated for credit*

MAR 575 Special Topics: Geological Oceanography

The course proposes to take several views of the ecology and biogeochemistry of intertidal wetlands to see whether one or more of these views might be useful in reinvigorating interest in the study of wetland function for its own sake. Ecology and plant life history will be studied in addition to geology and wetlands management.

*Spring, 1-4 credits, ABCF grading
May be repeated for credit*

MAR 576 Special Topics: Biological Oceanography

The course is designed for the discussion of topics of special interest on demand that are not covered in regularly scheduled courses. Examples of possible topics include grazing in benthic environment, coastal upwelling, the nature of marine ecosystems, and marine pollution processes.

*Fall, 1-4 credits, ABCF grading
May be repeated for credit*

MAR 577 Special Topics: Coastal Zone Management

The course is designed for the discussion of

topics of special interest on demand that are not covered in regularly scheduled courses. Examples of possible topics include micro-computer information systems, environmental law, coastal pollution, dredge spoil disposal, science and technology in public institutions, and coastal marine policy.

*Fall and spring, 1-4 credits, ABCF grading
May be repeated for credit*

MAR 580 Seminar

A weekly series of research seminars presented by visiting scientists and members of the staff.

*Fall and spring, S/U grading
May be repeated for credit*

MAR 581 Coastal Engineering Geology

Concepts of the mechanics of earth materials and the physics of surficial processes with applications to the coastal environment and engineering.

*Prerequisites: Enrollment in MESP or
OCN program or permission of instructor
3 credits, ABCF grading*

MAR 583 Basic Fluid Dynamics

An introduction to the subject of fluid mechanics, especially for students in physical oceanography, geological oceanography, or atmospheric sciences. The course presents kinematics and conservation principles followed by selected topics from the text. These topics are chosen because of their relevance to oceanography and atmospheric sciences. They may include but are not limited to an introduction to: vortex motion, gravity waves in homogeneous and stratified flows, turbulence and boundary layers, scaling, and the effects of rotation.

Spring, 2 credits, ABCF grading

MAR 584 Applied Marine Ecology Seminar

This course provides an opportunity for advanced graduate students to practice presenting data on their thesis research in areas broadly related to how individuals and communities of marine organisms respond to changes in their environments. Each student will prepare an abstract of the work they plan to present and assign an appropriate review or research paper for the class to read. They will then prepare a formal presentation of their work suitable for a departmental seminar. Faculty and students will provide constructive criticism of the presentation as well as participate in a discussion of the work.

*Fall, every year, 1 credit, S/U grading
May be repeated for credit*

MAR 585 Coastal Geology Seminar

An assessment of recent developments in coastal geology. Discussion of advances in the application of sedimentology, stratigraphy, and geomorphology to the study of coastal environments. Modern-ancient analogues are emphasized where appropriate.

*Fall, 2 credits, S/U grading
May be repeated for credit*

MAR 586 Introduction to Ecological Modeling

This course will provide students with a familiarity of the major concepts, approaches, and underlying rationale for modeling in the ecological sciences. Topics will include reviews of theoretical and empirical models,

the use of models in adaptive management, and how to confront models with data to evaluate alternative hypotheses. Roughly one-third of the course will be devoted to the use of models in management, focusing on the problems of fitting models to data and management pitfalls that follow. Course work will consist of readings, in class exercises, and group assignments that involve the construction, analysis, and interpretation of ecological models.

Spring, 3 credits, ABCF grading

MAR 587 Basics of Arc GIS

An introduction to the basic elements of GIS analysis with marine applications. The course includes "hands-on" exercises to familiarize students with Arc GIS capabilities and basics of a GIS toolbox. A project will be required with an emphasis on marine and coastal situations.

*Prerequisite: Matriculation in a graduate program
Spring, every year, 3 credits, ABCF grading*

MAR 590 Research

Original investigation undertaken with the supervision of the advisor.

*Fall and spring, 1-12 credits, S/U grading
May be repeated for credit*

MAR 591 Atmospheric Molecular Processes

Review of electromagnetic theory of scattering and spectroscopy in a manner appropriate for studies of planetary atmospheric phenomena involving gaseous molecules. A major portion is devoted to quantitative spectroscopic aspects of absorption of infrared radiation by planetary atmospheric gases. Spectral line shapes and band models.

Fall, alternate years, 3 credits, ABCF grading

MAR 592 Synoptic and Mesoscale Meteorology

Course examines the structure and evolution of synoptic and mesoscale systems using observations, modern dynamical analysis and numerical weather prediction models. Diagnosis of synoptic systems includes applications of quasi-geostrophic theory to baroclinic waves; jet stream and frontal circulations. A survey of the concepts of mesoscale systems includes convective systems, gravity waves and terrain-coastal circulations. The student will investigate such phenomena in the laboratory as well as through individual projects.

*Prerequisites: Permission of instructor
Spring, alternate years, 4 credits, ABCF grading*

MAR 593 Theoretical Meteorology I

Quantitative introduction to atmospheric thermodynamics, cloud physics, and radiative transfer; topics include the structure, stability, and energy balance of the atmosphere, and the formation of clouds and precipitation.

Fall, 3 credits, ABCF grading

MAR 594 Theoretical Meteorology II

Introduction to those elements of fluid dynamics and thermodynamics essential to understanding the large-and small-scale motions of the thermal atmosphere.

Fall, 3 credits, ABCF grading

MAR 595 Planetary Aeronomy

This course focuses on the chemical and

thermal structures of planetary atmospheres, especially upper atmospheres, examining the ways that solar energy is absorbed and how it relates to the neutral and ionic composition, temperature, and airglow features of the atmosphere. The escape of species from the top of the atmosphere and atmospheric evolution is also addressed.

Spring, alternate years, 3 credits, ABCF grading

MAR 596 Principles of Atmospheric Chemistry

The application of photochemistry and reaction kinetics to the atmospheres of the Earth and planets. The composition and structure of various regions of atmospheres, including the troposphere, stratosphere, and ionosphere. Incorporation of chemical rate processes and physical transport into models. Production of airglow and auroral emissions.

Fall, alternate years, 3 credits, ABCF grading

MAR 597 Climate Dynamics

Fundamentals of the observed climate system. Simple climatic models including energy balance models and radiative-convective models. Physical processes in the climate system and their quantitative simulations with emphasis on convection and clouds, radiation, soil temperature and moisture, snow and ice, etc. Introduction to numerical climate modeling.

Fall, alternate years, 3 credits, ABCF grading

MAR 598 Synoptic and Mesoscale Meteorology

Course examines the structure and evolution of synoptic and mesoscale systems using observations, modern dynamical analysis, and numerical weather prediction models. Diagnosis of synoptic systems includes applications of quasi-geostrophic theory to baroclinic waves; jet stream and frontal circulations. A survey of the concepts of mesoscale systems includes convective systems, gravity waves, and terrain-coastal circulations. The student will investigate such phenomena in the laboratory as well as individual projects.

Spring, alternate years, 4 credits, ABCF grading

MAR 599 Atmospheric Boundary Layer Processes

This course provides the theoretical foundation for a quantitative understanding of transport processes and chemical transformations in the atmospheric boundary layer. Topics covered in this course include the equations of motions for the lower troposphere; the budget of turbulent kinetic energy; turbulent fluxes of momentum, heat and mass; treatment of chemical transformations; and the representation of these processes in numerical models.

*Prerequisite: MAR 593, MAR 594
3 credits, ABCF grading*

MAR 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered

*on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor
Fall, spring, summer, 1-9 credits, S/U grading
May be repeated for credit*

MAR 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

MAR 800 Summer Research

May be repeated for credit

Coastal Oceanography Courses

OCN 610 Waves

Theory and observations of surface waves, internal waves, and planetary waves; wave-wave, wave-current, and wave-turbulence interactions; surface wave prediction; beach processes.

Spring, alternate years, 3 credits, ABCF grading

OCN 612 Dynamical Oceanography I

The first course in a two-course series on basic methods and results in dynamical oceanography. This course emphasizes unstratified fluids. Topics covered include but are not limited to basic conservation equations, effects of rotation, geostrophy, potential vorticity conservation, Ekman layers, and Ekman pumping.

Fall, 3 credits, ABCF grading

OCN 615 Dynamical Oceanography II

Continuation of Dynamics I. Course covers some of the basic effects of stratification. Topics include potential vorticity for baroclinic motion and baroclinic instability.

Fall, 3 credits, ABCF grading

OCN 624 Oceanic Fronts

Course includes a description of various classes of fronts, including planetary scale fronts, major current boundaries, shelf break fronts, upwelling fronts, plumes, and tidal stirring fronts. Coverage of basic frontal dynamics and circulation, biological/chemical interactions, design of observational strategies.

Spring, 2 credits, ABCF grading

OCN 650 Dissertation Research

Original investigation undertaken with the supervision of research committee.

*Fall and spring, 1-9 credits, S/U grading
May be repeated for credit*

OCN 655 Directed Study

Individual studies under the guidance of a faculty member. Subject matter varies according to the needs of the student.

Fall, spring, and summer, 1-9 credits, ABCF grading

May be repeated for credit

OCN 670 Practicum in Teaching

Fall and spring, 1-3 credits, S/U grading

May be repeated for credit

OCN 677 Benthic Ecology

This course will focus on the ecological interactions of benthic organisms with their habitat. There will be discussion on life histories and feeding strategies, and the roles of competition, predation, and disturbance.

Spring, 2 credits, ABCF grading

OCN 694 Graduate Seminar in Atmospheric Sciences

Discussion of special research topics centered on monographs, conference proceedings, or journal articles. Topics include climate change, atmospheric chemistry, radiation transfer, and planetary atmospheres. This course is intended primarily for students who have passed the written qualifying examination in atmospheric sciences, although other students may enroll with permission of the faculty seminar leader.

*Fall and spring, 0-3 credits, ABCF grading
May be repeated for credit*

OCN 699 Dissertation Research on Campus

Research course exclusively for students who have been advanced to candidacy (G5) in the Coastal Oceanography. Major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab.

Fall, spring, and summer, 1-12 credits, S/U grading

May be repeated for credit

OCN 800 Summer Research

May be repeated for credit

Materials Science and Engineering (ESM)

Chairperson: Michael Dudley, Old Engineering Building 312 (631) 632-8500

Graduate Program Director: Dilip Gersappe, Old Engineering Building 316 (631) 632-8499

Department Office: Old Engineering Building 314, Zip 2275 (631) 632-8484

Office Staff: Lynn Allopenna, Sr. Staff Assistant; Debby Michienzi, Staff Assistant

Degrees awarded: M.S. in Materials Science and Engineering; Ph.D. in Materials Science and Engineering

The Department of Materials Science and Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. The motivating philosophy of the graduate program is to provide the student with a broad synthesis of the theoretical and experimental techniques required to work with all classes of materials. Emphasis is placed on courses that unify the field in terms of fundamentals treated with sufficient depth to enable the student to make technological contributions in diverse areas of materials science and engineering. Laboratory and coursework are structured to provide programs for students who (1) are entering intensive basic research-oriented programs leading to Ph.D. or Master of Science degrees, (2) are currently employed and can complete their studies in the evening, or (3) are working in materials-related industries and can integrate their work experience into their degree requirements.

Industrial Cooperative Ph.D. Program

A special extramural Ph.D. degree program is offered by the Department of Materials Science and Engineering for highly qualified individuals working in an industrial materials research area. Candidates for this program must have met the graduate coursework requirements for the Ph.D. typically by earning a master's degree. Doctoral research is generally done at the student's place of employment, rather than on the University campus. Contact the Department for further information.

One-Year Master's Degree Program

Students admitted to this program can complete all requirements for the degree in two semesters of full-time study. Required courses are given in the late afternoon or evening and research projects can be carried out at the student's work location. Contact the Department for further information.

Bachelor of Science Degree/ Master of Science Degree Program

An engineering science, engineering chemistry, or physics student may apply at the end of the junior year for admission to this special program, which leads to a Bachelor of Engineering or Bachelor of Science degree at the end of the fourth year and a Master of Science degree at the end of the fifth year. In the senior year, a student in the program takes three credits of ESM 599 Research and three credits of an additional graduate course. In the fifth year, the student takes 24 credits, of which at least 21 credits are coursework and three credits are ESM 599 Research. The advantages of this program over the regular M.S. program is that a student may start his or her M.S. thesis in the senior year, and that he or she needs only 24 credits in the fifth year as opposed to 30 credits for a regular M.S. student. For details of the M.S. degree requirements, see the graduate program director.

Research Activities

Since its inception, the Department has had a strong research component, with a major emphasis in surface science and engineering. The Department has been successful in obtaining external funding for research and currently has the highest per capita faculty funding within the University. In 2003, the Department topped the list for research funding in the College of Engineering and Applied Sciences. The Department boasts more than \$4 million in external funding for 15 total full-time faculty members. The Department hosts two awarded National Science Foundation (NSF) Materials Research Science and Engineering Centers (MRSEC) in Polymers and Thermal Spray Research. This makes Stony Brook the only university in the United States with two MRSECs. Considerable support from the University as well as other organizations forms part of the MRSEC portfolio. The MRSECs are defined by their interdisci-

plinary research and, as such, offer considerable interaction with departments both inside and outside the University. These centers offer a unique and rich environment for interdisciplinary graduate research and education.

The Polymer MRSEC, also known as the Garcia Center for Polymers at Engineered Interfaces, offers an interdisciplinary program aimed at studying the molecular basis of macroscopic phenomena. With funds from industrial partners, the NSF and the Department of Energy (DOE), research is conducted on polymer dynamics, nanopatterning, thin film and interface engineering, surface modification, blends, polyelectrolytes, adhesion, block polymers, and wetting.

The Center for Thermal Spray Research (CTSR) conducts both applied and fundamental research on thermal spray technology, which involves melt spray formation of protective coatings and free standing forms. CTSR is a unique facility containing a vast array of industrial-level plasma and combustion spray devices. In 1999, CTSR's research program received a significant boost through a \$5 million award from the Defense Advanced Research Projects Agency (DARPA) to pursue revolutionary applications of thermal spray in electronics. Under the auspices of the Mesoscale Integrated Conformal Electronics initiative, CTSR has expanded its reach in the design, synthesis, and applications of thick film electronics and sensor materials. A new laboratory for both electronics fabrication and characterization has been set up.

Recent awards made to the faculty include two NSF Nanoscale Integrated Research Team awards (totaling \$2 million), one concerning the use of metal oxide electronic noses for use as molecular and biological sensors, and the other concerning molecular electronics on the nanoscale.

The proximity to Brookhaven National Laboratory (BNL) and its advanced national facilities has been a major benefit to both faculty and students within the Department. Several faculty members hold guest appointments at

BNL, while Brookhaven scientists participate in research and teaching within the Department. The DOE awarded the contract to manage BNL in 1998 to Brookhaven Science Associates, a consortium of other universities led by Stony Brook and the Battelle Memorial Institute. The University's relationship with this premier research facility greatly enhances both the Department's and Stony Brook's research programs.

At BNL, the facilities available to the Department include particle accelerators for carrying out ion beam surface modification experiments and highly sophisticated surface analysis probes. The National Synchrotron Light Source (NSLS) is also located at BNL. As one of the participating research teams at NSLS, the Synchrotron Topography Research Group, centered in Stony Brook's Department of Materials Science and Engineering, is using special X-ray methods to image nondestructively dislocation microstructures. This enables image-detailed descriptions of dislocation growth and plastic deformation and fracture, as well as to interesting materials behaviors. The topographic method is also being used in department-based studies of surface chemical reactivity. The Department recently was awarded a \$1 million NSF Major Research Instrumentation grant to set up a center for crystal growth. The center is focused on developing capabilities for tackling the most challenging problems in crystal growth of novel advanced materials, and currently includes a high-pressure, high-temperature furnace for crystal growth of III-nitrides from solution-melts, a low-temperature CVD reactor for deposition of ZnO films, a two-zone high-temperature resistance-heater furnace for sublimation growth of ZnO, and a high-temperature RF reactor for SiC sublimation growth.

As a result of the University's Engineering 2000 initiative, our ties with industry are growing stronger: faculty members are working with industry on joint research projects and submitting cooperative proposals to outside agencies. The Materials Science Department has led the effort in joint industry-University projects within the College of Engineering through the New York State Strategic Partnership for Industrial Resurgence (SPIR) program.

Stony Brook's own facilities include state-of-the-art low-energy electron diffraction LEED; a state-of-the-art scanning electron microscope and a

transmission electron microscope, both equipped with analytical capabilities and the latest software for electron diffraction simulation and image processing; an atomic force microscope; and electron spectroscopy for chemical analysis (ESCA) IAES/SIMS Infrared Microscopy units, as well as central characterization facilities that include equipment for microanalysis and X-ray techniques. A well-equipped materials fabrication and processing facility within the department boasts a collection of furnaces capable of reaching 3,000°C in controlled atmospheres or under vacuum, a resist-spinner, ellipsometer, contact angle goniometers, and a high-resolution Nomarsky metallurgical microscope with image processing capability.

The analytical electron facility of the Department consists of both scanning and transmission electron microscopes. The state-of-the-art Schottky Field Emission Scanning Electron Microscope (SEM) (LEO Gemini 1550) includes an In-Lens Secondary Electron Detector in addition to the standard E-T detector, and a Rutherford Backscatter Electron Detector. This SEM allows for high resolution imaging of the surfaces and cross-sections of all types of solid materials. It is also fully equipped with an EDS (energy dispersive X-ray spectroscopy) system using an EDAX detector that provides elemental compositions and X-ray maps of the various phases of the materials examined. Finally, the SEM includes an Electron-Backscattered Electron Diffraction (EBED) analysis system based on the TSL/EDAX orientation imaging and Phase-ID software that allows for non-destructive diffraction analysis and orientation imaging (texture analysis) of the grain structure of the surface of the specimens tested.

This facility also includes a digitally controlled Transmission Electron Microscope (Philips CM12), complete with EDS and PEELS (Parallel-reading Electron Energy Loss Spectroscopy) facilities for detailed analytical studies. This tool allows for the direct observation of the "internal" structure of materials at resolutions as low as a few Å and for the determination of the crystal structure of their various components.

There are also facilities for sample preparation for electron microscopy and microanalysis observations, including precision ion milling units (such as VCR Group XLA 2000).

Furthermore, advanced software for electron diffraction patterns simulation and image processing is available (e.g., Desktop Microscopist and Digital Micrograph).

Another research area that is emerging in the Department includes the development and testing of chemical sensors. A gas sensor testing facility is being set up in the Department and it will be available shortly.

Other surface-related research involves studies of surface/environmental interactions. Using unique combinations of electron and ion spectroscopies, infrared and optical microspectroscopy and synchrotron based techniques, research is being conducted into corrosion behavior and corrosion inhibition of engineering alloys, degradation of paints and other coatings, remediation of contaminated surfaces, and surface cleaning. Much of this work has included collaborations with other universities, industries, national laboratories, and government facilities such as the Army Research Laboratory, Weapons and Materials Directorate (Aberdeen, MD). An evolving area of collaborative research involves related studies of unique thin films and structures formed using femtosecond laser ablation. The structure of epitaxial surface monolayers is being studied using LEED; extension of this research is also performed at the NSLS. The preparation of thin films of magnetic metals is studied using ultrahigh-vacuum (UHV) molecular beam epitaxy (MBE) processing. These materials are used in the computer industry in disk storage devices. The magnetic properties of these materials are studied using a vibrating sample magnetometer (VSM) and magneto-optic Kerr effect (MOKE) spectroscopy. Research is also being performed on the chemical makeup of the newly discovered high-temperature superconductors. Novel methods of rapidly spraying such materials onto surfaces are being developed. Through a Department of Defense instrumentation program, a comprehensive thermal analysis and porosity laboratory has been set up within the Department.

Consistent with Stony Brook's designated mission as a research center, the cornerstone of the Department's academic program is the graduate work leading to the research-oriented M.S. and Ph.D. degrees. The Department has about 50 full-time, fully supported

students and as many as 10 part-time students, most of whom work in Long Island's high-technology industries.

Admission

Admission is based on the graduate program committee's assessment of the applicant's aptitude for research and the compatibility of his or her interests with the active research programs and capabilities of the Department. Applicants are advised to pay particular attention to their statements of purpose (page 3 of the application form). Minimum requirements, in addition to those of the Graduate School, are as follows:

A. A bachelor's degree in engineering, mathematics, physics, chemistry, or a closely related area from an accredited college or university;

B. A minimum grade average of at least a B in all courses in engineering, mathematics, and science;

C. Results of the Graduate Record Examination (GRE) General Test;

D. For foreign students, results of the TOEFL exam with a score of at least 600, or approved equivalent;

E. Acceptance by both the Department of Materials Science and Engineering and the Graduate School.

Faculty

Distinguished Professors

Chu, Benjamin, Ph.D., 1959, Cornell University: Structure and dynamics of supermolecular and polymeric systems, using laser-light scattering, fluorescence recovery after photo bleaching, transient electric birefringence, small-angle X-ray scattering with synchrotron radiation, and other spectroscopic techniques.

Herman, Herbert, Ph.D., 1961, Northwestern University: Protective coatings; thermal spray; composites; marine materials.

Professors

Clayton, Clive R., Ph.D., 1976, Surrey University, England: Environmental degradation of materials; XPS; AES; dynamic and static SIMS; electrochemical analysis synthesis by ultra-fast laser ablation; RHEED; protective coatings.

Dudley, Michael, *Chairperson*. Ph.D., 1982, University of Warwick, England: Synchrotron topography; crystal defects; mechanical properties.

Jona, Franco P., Ph.D., 1949, Swiss Polytechnic Institute (E.T.H.), Switzerland: Surface physics; LEED.

Rafailovich, Miriam, Ph.D., 1980, Stony Brook University: Polymeric liquids; phase transitions; thin film wetting phenomena; atomic force microscopy; ion, X-ray, and neutron scattering.

Sampath, Sanjay, Ph.D., 1989, Stony Brook University: Thermal spraying; protective coatings; functioning graded materials; thick film electronics and sensors.

Seigle, Leslie, *Emeritus*. Ph.D., 1951, Massachusetts Institute of Technology: Thermodynamics of solids; diffusions in solids; protective coatings.

Sokolov, Jonathan C., Ph.D., 1983, Stony Brook University: Surface and interface properties of polymers and blends; phase transitions; neutron and X-ray scattering; EXAFS; SIMS.

Associate Professors

Gersappe, Dilip, *Graduate Program Director*. Ph.D., 1992, Northwestern University: Polymer theory and simulation.

Gouma, Pelagia-Irene (Perena), Ph.D., 1996, University of Birmingham, England: Advanced materials characterization; electron microscopy and microanalysis techniques; chemical sensors.

Halada, Gary, Ph.D., 1993, Stony Brook University: Electron spectroscopy; electrochemistry; surface engineering; optical spectroscopy; environmental remediation.

Assistant Professors

Gouldstone, Andrew, Ph.D., 2001, Massachusetts Institute of Technology: Mechanical behavior of materials and biomaterials; thermal spray center.

Rojo, Carlos J., Ph.D., 1997, University Autonoma de Madrid, Spain: Crystal growth materials for electronic and optoelectronic applications.

White, Henry, Ph.D., 1999, Stony Brook University: Nanocomposites; materials joining.

Research Professors

Gambino, Richard, M.S., 1976, Polytechnic Institute of New York: Magnetic thin films; magneto-optical properties; Hall effect and magneto-resistance of magnetic metals; epitaxial growth of magnetic materials.

Mahajan, Devinder, Ph.D., 1979, University of British Columbia: Inorganic chemistry; fuel cells; catalysis.

Adjunct Faculty

Berndt, Christopher C., Ph.D., 1980, Monash University, Australia: Protective coatings; mechanical properties; biomaterials; thermal spray.

Berndt, Marita, Ph.D., 1991, Monash University, Australia: Mechanical and physical properties of cementitious materials.

Chidambaran, Dev, Ph.D., 2003, Stony Brook University: Corrosion science and surface analysis.

Cooley, Lance, Ph.D., 1993, University of Wisconsin, Madison: Materials science.

Czajkowski, Carl, Ph.D., 1996, Stony Brook University: Nuclear materials engineering.

Dasgupta, Avijit, Ph.D., P.E., 1983, University of Miami: Environmental engineering.

Goland, Allen N., Ph.D., 1956, Northwestern University: Solid-state physics; defects; interaction of radiation with condensed matter.

Granata, Richard, Ph.D., 1977, American University: Physical chemistry; electrochemistry and corrosion.

Huang, Xianrong, Ph.D., 1995, Nanjing University, China: X-ray typography.

Kondakis, Nicholas, Ph.D., 1989, Columbia University: High energy physics.

Lelie, Daniel van der, Ph.D., 1986, University Groningen, The Netherlands: Anthropogenetics.

Lewis, Laura J.H., Ph.D., 1993, University of Texas, Austin: Materials science and engineering.

Pernodet, Nadine, Ph.D., 1996, Louis Pasteur University, Strasbourg, France: Physical chemistry and polymers.

Russo, Lysa, M.S., 1992, Stony Brook University: Materials science.

Samuilov, Vladimir, Ph.D., 1986, Belarus State University: Physics.

Senturk, Ufuk, Ph.D., 1997, Alfred University: Ceramic engineering and science.

Tobin, Al, Ph.D., 1968, Columbia University: Metallurgy.

Twiley, John, B.S., 1976, University of California, Riverside: Chemistry.

Ulman, Abraham, Ph.D., 1978, Weizmann Institute of Science: Physical and organic chemistry.

Zaitsev, Vladimir, Ph.D., 1992, Moscow State University, Russia: Chemistry.

Zhu, Yimei, Ph.D., 1987, Nagoya University, Japan: Materials physics.

Zhou, Peter, Y., Ph.D., 1983, University of Pennsylvania: Materials science.

Degree Requirements

Requirements for the M.S. Degree

In addition to the minimum requirements of the Graduate School, the requirements for the M.S. degree in the Department of Materials Science and Engineering can be satisfied by either one of the two following options:

M.S. Non-Thesis Option

A. Election

The election of this option must be made by the student upon admission to the program and is considered a terminal degree.

B. Coursework

1. A minimum of 30 graduate credits with a grade point average of 3.0 or

better in all graduate courses taken is required to graduate. All credits must be from coursework.

2. The 30 credits must include the following three core courses: ESM 511 Thermodynamics of Solids; ESM 513 Strength of Materials; and ESM 521 Diffusion in Solids. If the student does not receive a minimum of a B in a core course, he or she may repeat that course one other time.

3. In addition, all students who are supported as Teaching Assistants must complete ESM 501 Teaching and Mentoring Techniques and ESM 698 Practicum in Teaching.

4. Only six credits of ESM 696 Special Problems in Materials Science are allowed.

5. All courses taken outside the Department require permission from the graduate program director.

M.S. Thesis Option

A. Election

The election of this option must be made by the student upon admission to the program, and is normally considered part of the Ph.D. sequence. Students may not transfer to the Non-thesis Option while registered for a Thesis Master's or a Ph.D. degree.

B. Coursework

1. A minimum of 30 graduate credits is required to graduate; 24 credits must be from coursework. An average grade of B or better is required for all courses.

2. The 30 credits must include the following three core courses: ESM 511 Thermodynamics of Solids; ESM 513 Strength of Materials; and ESM 521 Diffusion in Solids. If the student does not receive a minimum of a B in a core course, he or she may repeat that course one other time.

3. In addition, all students who are supported as Teaching Assistants must complete ESM 501 Teaching and Mentoring Techniques and ESM 698 Practicum in Teaching.

4. The 30 credits must include six credits of ESM 599 Research.

5. Only six credits of ESM 696 Special Problems in Materials Science are allowed.

6. All courses taken outside the Department require permission from the graduate program director.

C. Thesis

For the student who elects to complete a thesis for the M.S. degree, the thesis must be approved by three faculty members, at least two of whom are members of the Department of Materials Science and Engineering, including the research advisor.

D. Final Recommendation

Upon fulfillment of the above requirements, the graduate program committee will recommend to the dean of the Graduate School that the Master of Science degree be conferred or will stipulate further requirements that the student must fulfill.

E. Transfer to Other Options

Transfer to another degree option in the Department can be made only with the written permission of the graduate program director.

Requirements for the Ph.D. Degree

A. Plan of Work

Before completion of one year of full-time residence, the student must have selected a research advisor who agrees to serve in that capacity. The student will then prepare a plan of further coursework. This must receive the approval of the student's advisor and of the graduate program committee.

B. Coursework

1. An average grade of B or higher is required for all courses.

2. A minimum of 24 graduate course credits is required to graduate (excluding ESM 599, 697, 698, and 699).

3. The 24 course credits must include the following three core courses: ESM 511 Thermodynamics of Solids; ESM 513 Strength of Materials; and ESM 521 Diffusion in Solids. If the student does not receive a minimum of a B in a core course, he or she may repeat that course one other time.

4. All students must complete ESM 501 Teaching and Mentoring Techniques.

5. The student must pass at least three credits of ESM 698 Practicum in Teaching and six credits of ESM 699 Dissertation Research on Campus.

6. Only six credits of ESM 696 Special Problems in Materials Science are allowed.

7. All courses taken outside the Department require permission from the graduate program director.

C. Preliminary Examination

The preliminary examination must be taken before the beginning of the student's fifth semester. This is an oral examination designed to test the student's ability to utilize his or her materials science background to carry out research in a chosen field of study, and to make clear written and oral presentations of research. At least ten days prior to the examination, the candidate should submit a research proposal (10-15 pages) to the examiners that places the research in context and outlines a scenario for its completion.

The examination committee will consist of four members: the research advisor, two Materials Science and Engineering Department faculty members, and one member from outside the Department. If a second examination is required, it must be completed by the tenth week of the fifth semester.

D. Advancement to Candidacy

After the student has successfully completed all requirements for the degree, other than the dissertation, he or she is eligible to be recommended for advancement to candidacy. This status is conferred by the dean of the Graduate School upon recommendation of the chairperson and the graduate program director.

E. Dissertation

The most important requirement of the Ph.D. degree is the completion of a dissertation, which must be an original scholarly investigation. The dissertation shall represent a significant contribution to the scientific literature, and its quality shall be compatible with the publication standards of appropriate and reputable scholarly journals. At least two semesters should elapse between the preliminary exam and submission of the dissertation.

F. Defense

The candidate shall defend the dissertation before an examining committee consisting of four members, including the research advisor, two members of the Materials Science and Engineering Department, and one member from outside the Department.

G. Time Limit

All requirements for the Ph.D. degree must be completed within seven years after completing 24 credit hours of graduate courses in the program.

Courses

ESM 501 Teaching and Mentoring Techniques

Discussion of various phases of teaching, including preparation, classroom technique, and student evaluation. Also exploration of skills and understanding necessary for mentoring undergraduates and others involved in research.

Fall, 1 credit, S/U grading

ESM 502 Scanning Electron Microscopy Skills

Practical introduction to the operation of scanning electron microscopes, including energy-dispersive X-ray spectrometers. Required of all students who use the SEM in their research.

Spring, 1 credit, ABCF grading

ESM 503 Electron Diffraction

A quantitative discussion of electron diffraction as a means of micro-characterization of materials and as a basis for understanding image contrast in the transmission electron microscope. Topics covered include atomic, kinematical, and dynamical scattering; indexing diffraction patterns; and convergent-beam diffraction.

Spring, 3 credits, ABCF grading

ESM 511 Thermodynamics of Solids

Current knowledge regarding the thermodynamic properties of condensed phases is discussed. The thermodynamic treatment of ideal, regular, and real solutions is reviewed. Estimation of reaction-free energies and equilibria in condensed phase reactions such as diffusion, exication, and phase transformations; thermodynamic analysis of phase equilibrium diagrams.

Fall, 3 credits, ABCF grading

ESM 512 Structure of Materials

The structure of solids can be studied using X-ray, neutron, and electron diffraction techniques. Topics covered are coherent and incoherent scattering of radiation, structure of crystalline and amorphous solids, stereographic projection and crystal orientation determination, the concept of reciprocal vector space. Laboratory work in X-ray diffraction is also included.

Fall, 3 credits, ABCF grading

ESM 513 Strength of Materials

A unified approach for all solid materials will be used with regard to the correlation between microstructure and their macroscopic mechanical properties. The course deals with various testing techniques for delineating mechanical properties of materials, considering elasticity, inelasticity, plasticity, dislocation theory, cohesive strength, fracture, and surface wear. Attention is given to strengthening mechanisms for solids, metals, ceramics, and polymers.

Spring, 3 credits, ABCF grading

ESM 521 Diffusion in Solids

Kinetics and Transformations I changed to Diffusion in Solids. Atomistic rate processes in solids with emphasis on diffusion in crystals. Theory of diffusion and experimental techniques; the role played by a broad class of crystalline imperfections. Topics include annealing of deformed materials, kinetics of defect interactions, thermally controlled deformation, kinetics of nucleation and growth, solidification, and precipitation.

Fall, 3 credits, ABCF grading

ESM 522 Imperfections in Crystals

The characteristics of point defects in metals, semiconductors, and ionic solids are described, and the thermodynamics of point defects is developed. Dislocation theory is introduced and the structures of internal boundaries are described. Finally, interactions between lattice imperfections are discussed, with emphasis on plasticity and fracture.

Fall, 3 credits, ABCF grading

ESM 523 Solid-State Electronics

A study of the electronic processes in solids leading to the analysis and design of materials and devices. Crystal structures, binding, electrical and thermal conductivities, diffusion, galvanomagnetic, thermomagnetic, and thermoelectric effects. Hall effect and magnetoresistance. Conductivity in thin films.

Spring, 3 credits, ABCF grading

ESM 531 Phase Transformations

Kinetics and Transformations II changed to Phase Transformations. A review of the processes by which structures are changed in the solid state. Classical nucleation theory including homogeneous and heterogeneous mechanisms. Diffusion and diffusionless growth mechanisms. Transformation kinetics.

Spring, 3 credits, ABCF grading

ESM 532 Materials Processing

A study of manufacturing processes used in the semiconductor industries. Topics include single crystal growth, compound formation, zone refining, epitaxial growth, doping techniques, thin film techniques, thick film techniques, passivations, isolations, lead bonding techniques, cleaning and etching, and failure analysis; discrete devices and integrated circuit devices; various modern concepts in IC processing.

Spring, 3 credits, ABCF grading

ESM 533 Polymeric Materials

Introduction to the physical properties of polymeric materials. Conformations, phase diagrams, and flow properties of polymers and polymer solutions. Rubber elasticity of polymer networks and melts. Flory-Huggins lattice model for concentrated solutions. Applications to diffusion, segregation, and spinodal decomposition in polymer blends. Experimental methods.

Spring, 3 credits, ABCF grading

ESM 534 Advanced Laboratory

Students perform a series of advanced materials experiments which involve some independent research. The results are then written in a report suitable for publication in a journal or proceeding.

Fall, 3 credits, ABCF grading

ESM 542 Modern Electron Microscopy

Principles and practice for transmission and scanning transmission electron microscopes. Instrument design. Specimen preparation. Instrument operation. Electron diffraction and imaging theory. Microanalysis using X-ray and electron spectra. Typical electron microscope investigations are outlined and used as examples.

Spring, 3 credits, ABCF grading

ESM 543 Engineering Ceramics

The characterization of ceramics is reviewed with special reference to advanced engineering ceramics, bulk high-temperature superconductors, and ceramic magnets. Typical microstructures and thermal, mechanical, and electrical properties are compared. These properties are related to the various methods of processing.

Spring 3 credits, ABCF grading

ESM 550 Introduction to Homeland Security

The course is a combination of lectures and laboratory experience to introduce students to critical issues and assess needs for homeland security. The course includes invited lectures by experts on special topics such as fundamentals of nuclear, chemical, and biological weapons and the associated threat to the transportation of goods and the public. The students will learn about cyber security, devices to safeguard materials from terrorist threats, safety of nuclear power plants and water supply, forensics and emergency preparedness. The students will submit a term paper on a selected topic in lieu of the final exam.

Spring, 3 credits, ABCF grading

ESM 553 Nuclear Safeguards and Security

The course is intended to familiarize students with the fundamentals of nuclear physics, radiation, mining, weapons and fuel cycle, other than producing electricity, as it pertains to nuclear power plants. Topics include nuclear detection, devices to safeguard nuclear materials from terrorist threats, needed physical protection for safe handling and its relevance to Homeland Security. The course combines lectures with hands-on experience at the newly installed nuclear detection facility located at the nearby U.S. Department of Energy's Brookhaven National Laboratory.

Spring, 4 credits, ABCF grading

ESM 554 Chemical and Biological Weapons: Safeguards and Security

This course deals with the fundamentals of chemistry and biochemistry related to chemical weapons (CW) and biological weapons (BW) that could be used by terrorists. Topics include CW and BW history, production, control, detection, identification, and emergency response measures to deal with intended or unintended release and escape, and security measures to protect and control stockpiles.

Spring, 4 credits, ABCF grading

ESM 555 Synchrotron Techniques in Materials Science

A short course in a selected synchrotron analytical technique as applied to problems in Materials Science. May include demonstration and hands-on experience at the national

synchrotron light source at Brookhaven National Laboratory, and synchrotron safety training.

*Pre or co-requisite: BNL Synchrotron Safety Training, students must complete BNL guest registration
1 credit, ABCF grading*

ESM 560 Risk Assessment, Regulation, and Homeland Security

The course focus is on risk assessment associated with nuclear, chemical and biological weapons as it relates to Homeland Security. Topics include air dispersion, uncertainty analysis, exposure measurements, epidemiology, toxicology, regulatory issues, risk management, risk communication, risk perception, and risk preparedness. The course will also cover laws and regulation, and disaster preparedness, various acts passed by the U.S. Congress to regulate water, air, and controlled substances.

Spring, 4 credits, ABCF grading

ESM 561 Crystal Growth Technology

The main goal of this course is to introduce graduate students to the fundamentals and physical principles that govern the process of crystal growth and show them how to apply those principles to design and engineer growth systems for different crystalline materials. While microscopic theory of nucleation and growth kinetics will be an essential part of this course, its core will mainly focus on applying transport phenomena and thermodynamics of chemical reactions to the design of processing reactors. As part of the academic requirements associated with this course, students will form teams and work on the virtual design of crystal growth reactors using software packages for transport phenomena modeling.

Fall, every year, 3 credits, ABCF grading

ESM 575 The Material World

The evolution of the Material World starting from the Big Bang, the creation of stars and galaxies, the nucleosynthesis of the elements in supernova explosions, formation of the Earth and Solar System, human adaptation of Earth resources to create the Modern World will be discussed. In this process we will discover the fundamental laws governing material behavior and explore the cosmic significance of our existence.

Winter, every year, 3 credits, ABCF grading

ESM 599 Research

*Fall and spring, 1-12 credits, S/U grading
May be repeated for credit*

ESM 600 Seminar in Surface Science

Discussions and reading on current problems in surface physics, chemistry, and crystallography.

Spring, 3 credits, ABCF grading

ESM 602 Seminar in Plasticity and Fracture

Intended for advanced students, especially those doing research in the area. Topics: detailed description of defects and their relations to mechanical structure; dislocation theory; plasticity and yield criteria; creep and fatigue; microscopic theory of fracture including ductile and brittle behavior and the relationship of plastic flow to cleavage.

Prerequisite: ESM 513

Fall, 3 credits, ABCF grading

ESM 604 Seminar in Ultrasonic Methods and Internal Friction in Solids

Review of advanced measurement techniques in the field of ultrasonics coupled with quantitative descriptions of experimental variables related to the sample microstructure. Applications to optical, electrical, and mechanical properties are discussed. Use of ultrasonics for nondestructive evaluation is considered.

Prerequisite: ESM 513

Spring, 3 credits, ABCF grading

ESM 605 Advanced Diffraction Techniques

Advanced topics in diffraction theory including the dynamical theory in perfect and imperfect crystals and its applications in imaging methods. Other topics from the following list are pursued if time is available: EXAFS/EXELFS/SEXAFS; LEED/RHEED; small-angle scattering; Kossel line and electron channeling patterns; convergent beam diffraction; phonon scattering; glancing incidence X-ray diffraction; diffraction from defect structures; colored symmetry; holography.

Prerequisites: ESM 512 or permission of instructor

Fall, 3 credits, ABCF grading

ESM 606 Seminar in Optical Properties of Material

A survey of modern optical materials and their characterization. The properties of both glasses and crystalline materials are related to physical origin. Electro-optic, elasto-optic, and magneto-optic properties and their interrelations are related to applications in technology including laser systems, displays, and spectroscopy.

Fall, 3 credits, ABCF grading

ESM 608 Seminar in Catalysis

Introduction to homogeneous and heterogeneous catalysis. Geometric factors in catalysis. The kinetics of heterogeneous catalysis. Electronic factors in catalysis: metals, semiconductors, and surface species. Preparation and properties of metal surfaces. Porosity. Typical industrial processes, e.g., Fischer-Tropsch, ammonia synthesis, ammonia oxidation, etc.

Fall, 3 credits, ABCF grading

ESM 610 Seminar in Reactions in Inorganic Solids

Crystal growth and the nature of defects in inorganic solids. Crystallography and nucleation phenomena in selected inorganic single crystals. Theories of isothermal decomposition kinetics. Measurement of decomposition rates. Radiation effects and nature of radiation damage in inorganic solids. Photodecomposition and the underlying theories of photolysis.

Fall, 3 credits, ABCF grading

ESM 612 Seminar in Advanced Thermodynamics of Solids

The fundamentals of the thermodynamics of irreversible processes are presented and the theory applied to thermal diffusion, thermoelectric transport, and other coupled processes in solids. Thermodynamics of multicomponent

phase equilibria. Diffusion, oxidation, and other rate processes in ternary and higher-order systems.

Prerequisite: ESM 511 or permission of instructor

Fall, 3 credits, ABCF grading

ESM 613 Seminar in Materials and Environment

Interactions between materials and their environments including corrosion, oxidation, absorption, and adsorption reactions. The influence of these reactions on the properties of materials, the design of materials resistant to these phenomena, alternative methods of protection, and the utilization of these reactions in promoting breakdown and deterioration of materials.

Spring, 3 credits, S/U grading

ESM 614 Seminar in Diffusion in Solids

Diffusion in solids is considered in detail, including solution of the transport equations for volume, grain boundary, and surface diffusion. Kirkendall effect and other diffusion phenomena, atomic mechanisms of diffusion, correlation effects, etc. Next, the theory of processes in which diffusion plays an important role is considered, such as ionic conduction, oxidation of metals, and the sintering of solids.

Spring, 3 credits, S/U grading

ESM 615 Seminar in Phase Transformations

The theory of phase transformations in solids is considered. Kinetics and mechanisms of nucleation and growth and martensitic transformations. Melting and solidification, precipitation from solid solution, polymorphic transformations, eutectic and eutectoid reactions, second-order transitions, recrystallization, and other transformations in solids.

Fall, 3 credits, S/U grading

ESM 695 Graduate Internship

Participation in private corporations, public agencies, or non-profit institutions for ongoing research activities related to thesis research. Students will be required to have a faculty coordinator as well as a contact in the outside organization, to participate with them in regular consultations on the project, and to submit a final report to both. Not accepted for credit toward the M.S. degree.

Prerequisite: Permission of graduate program director

1-3 credits, S/U grading

May be repeated for credit

ESM 696 Special Problems in Materials Science

Supervised reading and discussion of selected publications in particular fields of materials science. This course is designed primarily for advanced graduate students who are, or expect to be, involved in research in these areas, although other students may enroll with permission of the instructor.

Fall and spring, 0-3 credits, ABCF grading

May be repeated for credit

ESM 697 Materials Science Colloquium

A weekly series of lectures and discussions by visitors, local faculty, and students presenting current research results.

*Fall and spring, 0-3 credits, S/U grading
May be repeated for credit*

ESM 698 Practicum in Teaching

*Fall and spring, 0-3 credits, S/U grading
May be repeated for credit*

ESM 699 Dissertation Research on Campus

*Prerequisite: Advancement to candidacy (G5); major portion of research must take place on campus, at Cold Spring Harbor, or at Brookhaven National Lab
Fall, spring, and summer, 1-12 credits, S/U grading
May be repeated for credit*

ESM 700 Dissertation Research off Campus—Domestic

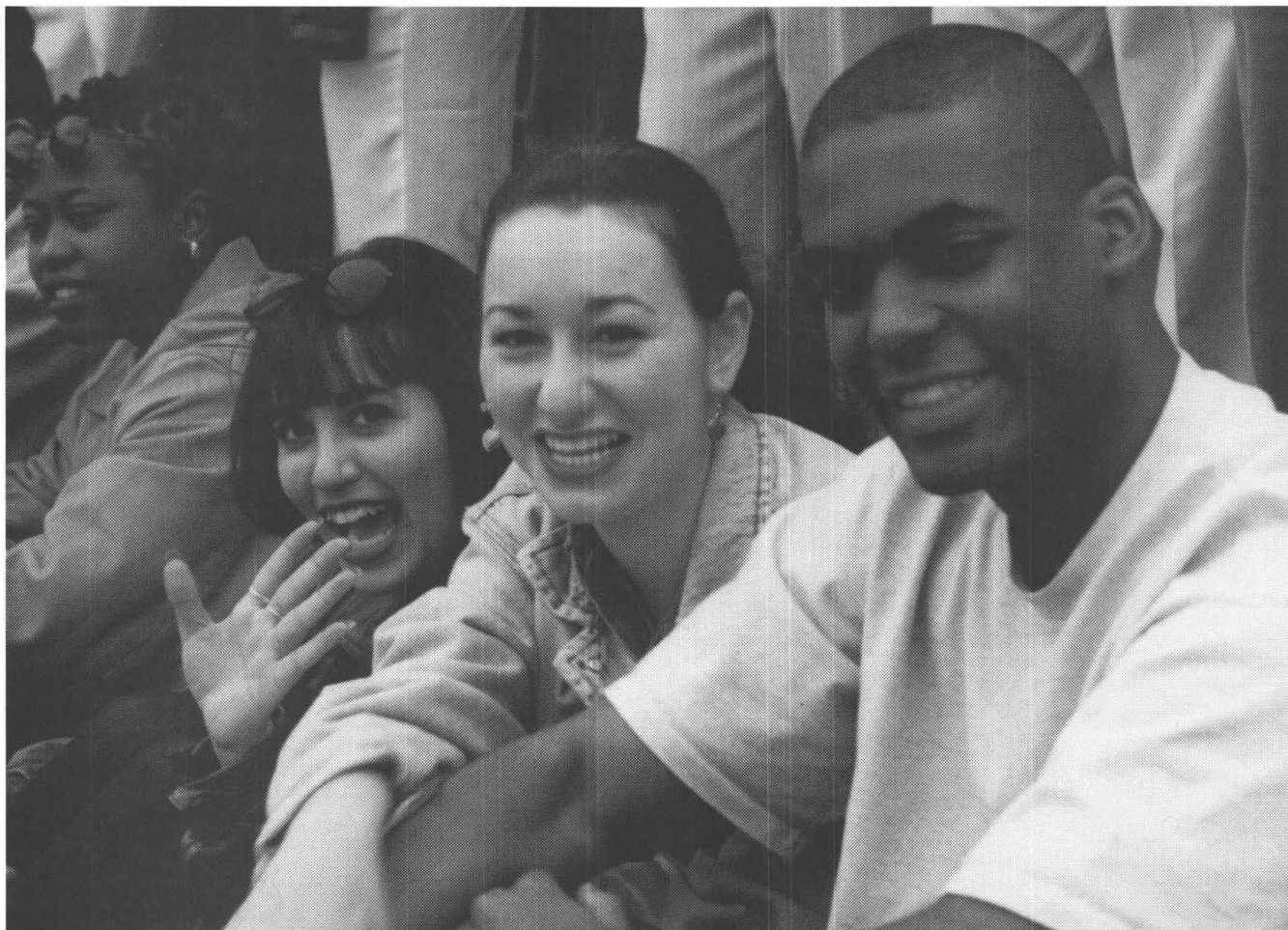
*Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

ESM 701 Dissertation Research off Campus—International

*Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

ESM 800 Summer Research

May be repeated for credit



Mathematics (MAT)

Chairperson: David Ebin, Mathematics Building 5-116 (631) 632-8290

Graduate Program Director: Michael T. Anderson, Mathematics Building 4-100A (631) 632-8282

Associate Graduate Program Director for Secondary Teacher Option Program: Bernard Maskit, Mathematics Building 5-112 (631) 632-8257

Graduate Secretary: Donna McWilliams, Mathematics Building P-143 (631) 632-8282

Degrees awarded: M.A. in Mathematics 7-12; M.A. in Mathematics; Ph.D. in Mathematics

The Department of Mathematics, in the College of Arts and Sciences, offers degree programs leading to the M.A. in Mathematics 7-12, the M.A. in Mathematics, and the Ph.D. in Mathematics. Several surveys, including the latest in U.S. *News and World Report's* "America's Best Graduate Schools," rank the department's graduate program in the top 20 in the nation.

Master of Arts in Teaching Mathematics 7-12

This is a 42 credit masters program administered by the School of Professional Development. It is designed for students who already have a bachelor's degree in mathematics or the equivalent and who wish to teach mathematics in grades 7-12. Individuals interested in this program should refer to the Education and Teacher Certification Programs (PEPP) section of this Bulletin.

The M.A. Program: Secondary Teacher Option

The Secondary Teacher Option is a two-year, part-time program designed for secondary school mathematics teachers who are seeking permanent certification. The nine required courses in the program are given in the evenings and in the summer on a rotating basis; each required course is offered at least once every two and a half years.

Admission

In addition to the Graduate School requirements, the minimum requirements for admission to this program are:

- A. A bachelor's degree;
- B. Two years of college-level mathematics, including one year of single variable calculus, one semester of linear algebra, and one additional semester of mathematics beyond single variable calculus;
- C. Provisional New York State Certification for Teaching Mathematics, Grades 7-12;

D. A grade point average of at least 3.0 in all calculus and post-calculus mathematics courses;

E. Evidence that the student is likely to succeed: this usually consists of three letters of recommendation from former teachers or supervisors;

F. Acceptance by both the Department of Mathematics and the Graduate School.

The M.A. and Ph.D. Programs: Professional Option

The Professional Option is designed for students who plan careers as professional mathematicians in research and/or teaching at universities and colleges (including two-year colleges), in industry, or in government. With rare exceptions, all students in this option are full-time students, and at least one year of full-time study is required.

Admission

In addition to the Graduate School requirements, the minimum requirements for admission to this program are:

- A. A bachelor's degree with a major in mathematics, or the equivalent;
- B. Evidence that the student is likely to succeed: this must include three letters of recommendation from mathematicians, usually from present or former teachers; the breadth and depth of mathematic courses taken, the grades obtained in these courses, as well as test scores on the Graduate Record Examination (GRE) General Test and a personal background essay are also considered;
- C. Foreign students: Evidence that the student can understand and speak English sufficiently well; a TOEFL score paper based of 550 or computer based of 213 is considered satisfactory;

D. Acceptance by both the Department of Mathematics and the Graduate School.

Faculty

Distinguished Professors

Glimm, James, Ph.D., 1959, Columbia University: Applied mathematics; numerical analysis; mathematical physics.

Lawson, H. Blaine, Jr., Ph.D., 1968, Stanford University: Differential geometry; topology; algebraic geometry.

McDuff, Dusa, Ph.D., 1971, University of Cambridge, England: Geometry; symplectic topology.

Milnor, John W.², *Director of the Institute for Mathematical Sciences*. Ph.D., 1954, Princeton University: Dynamical systems; topology; geometry.

Sullivan, Dennis², Ph.D., 1965, Princeton University: Dynamical systems; topology; geometry; partial differential equations; quantum topology.

Distinguished Service Professor

Kra, Irwin, *Emeritus*. Ph.D., 1966, Columbia University: Complex analysis; Kleinian groups.

Professors

Anderson, Michael, *Graduate Program Director*. Ph.D., 1981, University of California, Berkeley: Differential geometry; geometric analysis; mathematical physics.

Barcus, William, *Emeritus*. D.Phil., 1955, University of Oxford, England: Algebraic topology.

Bishop, Christopher, Ph.D., 1987, University of Chicago: Complex analysis.

Ebin, David, *Chairperson*. Ph.D., 1967, Massachusetts Institute of Technology: Global analysis; mathematics of continuum mechanics; partial differential equations.

Fox, William, *Emeritus*. Ph.D., 1955, University of Michigan: Complex analysis.

Geller, Daryl, Ph.D., 1977, Princeton University: Partial differential equations; harmonic analysis.

Gromoll, Dettlef, Ph.D., 1964, University of Bonn, Germany: Differential geometry.

Hill, C. Denson, Ph.D., 1966, New York University: Partial differential equations; several complex variables.

Jones, Lowell, Ph.D., 1970, Yale University: Topology; geometry.

Knapp, Anthony, *Emeritus*. Ph.D., 1965, Princeton University: Lie groups; representation theory.

Kumpel, Paul¹, *Emeritus*. Ph.D., 1964, Brown University: Algebraic topology.

LeBrun, Claude, D.Phil., 1980, University of Oxford, England: Differential geometry; complex analysis; mathematical physics; algebraic geometry.

Lister, William, *Emeritus*. Ph.D., 1951, Yale University: Algebra.

Lyubich, Mikhail², *Deputy Director of the Institute for Mathematical Sciences*. Ph.D., 1983, Tashkent State University, Russia: Dynamical systems.

Maskit, Bernard, Ph.D., 1964, New York University: Complex analysis; Riemann surfaces; Kleinian groups and their deformation spaces.

Michelsohn, Marie-Louise, Ph.D., 1974, University of Chicago: Differential geometry.

Phillips, Anthony V., Ph.D., 1966, Princeton University: Differential topology and applications to mathematical physics.

Pincus, Joel, *Emeritus*. Ph.D., 1959, New York University: Operator theory and integral equations.

Szusz, Peter, *Emeritus*. Ph.D., 1951, University of Budapest, Hungary: Analytic number theory.

Takhtajan, Leon, Ph.D., 1975, Leningrad Branch of the Steklov Mathematical Institute, Russia: Mathematical physics.

Associate Professors

de Cataldo, Mark, Ph.D., 1995, University of Notre Dame: Higher dimensional geometry.

Kirillov Jr., Alexander, Ph.D., 1995, Yale University: Representation theory; low dimensional topology; mathematical physics.

Popescu, Sorin, Ph.D., 1993, University of Saarland, Germany: Algebraic geometry and computational algebraic geometry.

Sutherland, Scott², *Director of Computing*. Ph.D., 1989, Boston University: Dynamical systems; root-finding algorithms; computing.

Assistant Professor

Portnoy, Neil, Ph.D., 1998, University of New Hampshire: Secondary mathematics teacher education; undergraduate mathematics learning.

Varolin, Dror, Ph.D., 1997, University of Wisconsin-Madison: Complex analysis and geometry.

Zinger, Aleksey, Ph.D., 2002, MIT: Symplectic topology; enumerative algebraic geometry.

James H. Simons Instructors

Casalaina-Martin, Sebastian, Ph.D., 2004, Columbia University: Algebraic geometry.

Craw, Alastair, Ph.D., 2001, University of Warwick, England: Algebraic geometry.

Gurel, Basak, Ph.D., 2003, University of California at Santa Cruz: Symplectic topology; Hamiltonian dynamical systems.

Jenquin, Jerome A., Ph.D., 2004, University of Texas at Austin: Differential geometry.

Kiritchenko, Valentina A., Ph.D., 2004, University of Toronto: Algebraic geometry.

Rochon, Frederic, Ph.D., 2005, MIT: Pseudo differential operators; index theory; K-theory.

Sawon, Justin, Ph.D., 2000, Cambridge University, England: HyperKähler manifolds; complex algebraic geometry; quantum invariants of knots and three-manifolds; mathematical physics.

Lecturers and Visitors

Chas, Moira, Ph.D., 1998, Universitat Autònoma de Barcelona, Spain: Dynamical systems; geometric topology.

Lilov, Krastio, Ph.D., 2004, University of Michigan, Ann Arbor: Dynamical systems; several complex variables.

Saric, Dragomir, 2001, City University of New York: Complex analysis; dynamical systems.

Timorin, Vladlen, Ph.D., 2004, University of Toronto: Convex geometry, algebraic geometry; dynamics.

Wiegand, Judy, M.S., 1969, Polytechnic Institute of New York, Brooklyn: Hamilton graph theory; teacher education.

RTG

Linch III, William, Ph.D., 2005, University of Maryland at College Park: Theoretical and mathematical physics.

Center for Math Education

Howe, Roger E., *Director (CME)*. Ph.D., 1969, University of California, Berkeley.

Number of teaching, graduate, and research assistants, fall 2005: 65

1) *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990*

2) *Member, Institute for Mathematical Sciences*

Degree Requirements

Requirements for the M.A. Degree

In addition to the requirements of the Graduate School, the following are required:

A. Completion of 30 credits in graduate courses approved by the department with a 3.0 overall grade point average;

B. Passing the comprehensive examination;

C. A nine-credit minor.

For students in the Secondary Teacher Option, the 30-credit requirement is ordinarily satisfied by the following courses: MAT 511 Fundamental Concepts of Mathematics, MAT 512 Algebra for Teachers, MAT 513-514 Analysis for Teachers I-II, MAT 515 Geometry for Teachers, MAT 516 Probability and Statistics for Teachers, MAT 517 Calculators and Computers for Teachers, MAT 518 Seminar in the Uses of Mathematics, MAT 519 Seminar

in Mathematics Teaching and a three-credit elective with a significant mathematical or pedagogical component. The comprehensive examination consists of the final examinations in MAT 512, 513, 514, and 515. The minor requirement is met by the three courses MAT 516, MAT 517, and MAT 518.

For students in the Professional Option, the courses that satisfy the 30-credit requirement are MAT 530-531 Topology/ Geometry I-II, MAT 534-535 Algebra I-II, MAT 542 Complex Analysis I, MAT 544 Real Analysis I, MAT 550 Real Analysis II, and MAT 598 Teaching Practicum. Unless specifically exempted by the Director of Graduate Studies, all first year graduate students are required to take the core courses, MAT 530, 531, 534, 535, 542, 544, and 550 during their first-year; this requirement is automatically waived for students who have passed the comprehensive examination (see the Guide to Graduate Study for exemption guidelines).

In addition, students preparing for the doctoral program ordinarily take MAT 590 Problem Seminar. The comprehensive examination consists of the final examinations in MAT 530, 531, 534, 535, 542, 544, and 550, or the equivalent. The minor program consists of three courses in an allied area such as applied mathematics, statistics, computer science, or theoretical physics.

Requirements for the Ph.D. Degree

In addition to the requirements of the Graduate School, the following are required:

A. Passing the doctoral comprehensive examination;

B. Passing the doctoral preliminary examination;

C. Demonstrating proficiency in reading mathematics in two relevant foreign languages, usually French and German; non-English-speaking international students can demonstrate their proficiency in one of these languages, in addition to their native language;

D. Advancement to candidacy;

E. Writing an acceptable dissertation;

F. Two consecutive semesters of full-time study.

Doctoral Comprehensive Examination

This examination, which is offered twice a year (just before the start of each semester), is designed to test mastery of the fundamentals of mathematics. This exam is based on the syllabi of the core courses: MAT 530, 531, 534, 535, 542, 544, 550. Students who transfer from graduate programs at other universities may, in some cases, be granted exemption from this requirement.

Doctoral Preliminary Examination

This examination is oral. Each student must take this examination no later than one year after passing the comprehensive examination or receiving an exemption therefrom. The chairperson and one additional member of the examining committee are chosen by the student; one additional member is chosen by the program.

Professional Academic Training Program

All full-time graduate students are required to participate in this program, consisting of supervised teaching/tutoring at the lower undergraduate levels.

Courses**Mathematics Education Courses**

Visit our Web site for the most current descriptions: www.math.sunysb.edu.

MAE 501 Foundations of Secondary Mathematics Curriculum

A re-examination of the current middle school and high school mathematics curriculum. A review of the techniques and discussion of the ideas from a more advanced point of view, including topics in algebra, geometry, elementary functions, and probability and statistics. Competence in basic secondary school mathematical ideas and techniques is tested. *Fall, 3 credits, ABCF grading*

MAE 510 Introduction to Methods of Teaching and Learning Standards

Introduction to the basic methods of teaching middle school and high school mathematics, including study of lesson designs based on National Council of Teachers of Mathematics (NCTM) and New York State standards, and the study of pedagogical techniques including cooperative learning and the uses of technology. Students also engage in guided observation of middle school and high school mathematics classes.

*Pre- or Co-requisite: MAE 501
Fall, 3 credits, ABCF grading*

MAE 520 Advanced Methods of Teaching Secondary School Mathematics

The philosophy and goals of mathematics education, with an emphasis on implementation;

curriculum development; teaching techniques and styles, and learning theories and styles; lesson planning and assessment. Students will plan an entire unit, the work sample, including lesson plans and assessments, for inclusion in the professional portfolio.

*Prerequisites: MAE 501 and 510
Spring, 3 credits, ABCF grading*

MAE 530 Directed Readings and Research Paper in Mathematics Education

Tutorial studies concerning current issues in Mathematics Education, including recent research and its relation to teaching practice. Students write a 10-page paper for inclusion in the professional portfolio.

*Prerequisites: MAE 501 and 510
Fall, spring, 1 credit, ABCF grading*

MAE 540 Clinical Experience

Supervised classroom experience in both middle school and high school settings, including experience in a high needs district, individual tutoring, working with small groups, and working as an inclusion aide. Seminar discussions focus on classroom observations and experiences.

*Prerequisites: MAE 501 and 510
Pre- or Co-requisite: MAE 520
Spring, 2 credits, ABCF grading*

MAE 551 Supervised Student Teaching in Middle School

Student teaching under the supervision of an experienced teacher in middle school and high school settings. These courses must be taken simultaneously.

Prerequisites: MAE 520, 530, and 540; satisfaction of all other program requirements; permission of the Director of Mathematics Education

*Co-requisite: MAE 552 and 554
Fall, spring, 3 credits, SIU grading*

MAE 552 Supervised Student Teaching in High School

Student teaching under the supervision of an experienced teacher in middle school and high school settings. These courses must be taken simultaneously.

Prerequisites: MAE 520, 530, and 540; satisfaction of all other program requirements; permission of the Director of Mathematics Education

*Co-requisite: MAE 552 and 554
Fall, spring, 3 credits, SIU grading*

MAE 554 Student Teaching Seminar

The student teaching experience (MAE 551/552) serves as a focus for weekly discussions of teaching and learning styles and techniques, and classroom management issues. Includes New York State mandated seminars on child abuse, substance abuse, and school violence.

Prerequisite: Permission of the Director of Mathematics Education

*Corequisites: MAE 551 and 552
Fall, spring, 3 credits, ABCF grading*

Core Courses for Teacher Option

Visit our Web site for the most current descriptions: www.math.sunysb.edu.

MAT 511 Fundamental Concepts of Mathematics

Brief history of mathematics; sets, functions and logic; constructions of number systems; mathematical induction. The main focus of the course will be on the construction and writing of mathematical proofs.

Fall, spring, or summer, 3 credits, ABCF grading

MAT 512 Algebra for Teachers

Linear algebra, the algebra of polynomials, algebraic properties of the complex numbers, number fields, solutions of equations.

*Prerequisite: MAT 511
Fall, spring, or summer, 3 credits, ABCF grading*

MAT 513 Analysis for Teachers I

Topics in differential calculus, its foundations, and its applications. This course is designed for teachers and prospective teachers of advanced placement calculus.

*Prerequisite: MAT 511
Fall, spring, or summer, 3 credits, ABCF grading*

MAT 514 Analysis for Teachers II

Topics in calculus, its foundations, and its applications. Emphasis is on integration and on numerical techniques. This course is designed for teachers and prospective teachers of advanced placement calculus. Analysis for Teachers I is not a prerequisite for this course.

*Prerequisite: MAT 511
Fall, spring, or summer, 3 credits, ABCF grading*

MAT 515 Geometry for Teachers

A re-examination of elementary geometry using concepts from analysis and algebra.

*Prerequisite: MAT 511
Fall, spring, or summer, 3 credits, ABCF grading*

MAT 516 Probability and Statistics for Teachers

A priori and empirical probabilities; conditional probability; mean and standard deviation; random variables; financial distributions; continuous distributions; sampling; estimation; decision making.

Fall, spring, or summer, 3 credits, ABCF grading

MAT 517 Calculators and Computers for Teachers

Calculators and Computers for teachers. Graphing calculators, programming, computing and curve sketching; Geometers Sketchpad or other computer based classroom tools; educational use of the Web.

Fall, spring, or summer, 3 credits, ABCF grading

MAT 518 Seminar on the Uses of Mathematics

This seminar explores the ways in which secondary school and elementary college mathematics are used in such diverse areas as psychology, sociology, political science, economics, business, engineering, physics, chemistry, biology, and medicine. Primarily for secondary school teachers of mathematics.

Fall, spring, or summer, 3 credits,
 ABCF grading

MAT 519 Seminar in Mathematics Teaching

Study of recent curricular and pedagogical developments in secondary school mathematics.
 Fall, spring, or summer, 3 credits, SIU grading

Introductory Courses for Professional Option

Visit our Web site for the most current descriptions: www.math.sunysb.edu.

MAT 530 Topology, Geometry I

Basic point set topology; connectedness, compactness, continuity, etc. Metric spaces, function spaces, and topological manifolds. Introduction to algebraic topology; fundamental group and covering space; homology; applications.
 Fall, 3 credits, ABCF grading

MAT 531 Topology, Geometry II

Foundations of differentiable manifolds: differentiable maps, vector fields and flows, and differential forms and integration on manifolds. Stokes' theorem. Frobenius theorem. Lie derivatives. Immersions and submersions. DeRham cohomology, cochain complexes, degree of a map, Mayer-Vietoris Theorem.
 Spring, 3 credits, ABCF grading

MAT 534 Algebra I

Groups: normal subgroups, quotient groups, Lagrange's theorem, class formula, finite p -groups and solvable groups, Sylow's theorems, finitely generated abelian groups. Rings and modules: subrings, fields, prime and maximal ideals, quotient rings, ID's, PID's, UFD's, polynomial rings, field of fractions, the Wedderburn theorem, Hilbert basis theorem, finitely generated modules over a PID. Vector spaces: basis, linear maps and matrices, dual spaces, determinants, eigen values and vectors, inner products, spectral theorem for normal operators.
 Fall, 3 credits, ABCF grading

MAT 535 Algebra II

Vector spaces: Cayley-Hamilton Theorem, Jordan normal form, bilinear forms, signature, tensor products, symmetric and exterior algebras. Homological algebra: categories and functors, universal and free objects, exact sequences, extensions. Representation theory for finite groups: irreducible representations and Shur's Lemma, characters, orthogonality. Galois theory: splitting fields, finite fields, extension fields of various types, Galois polynomial and group, fundamental theorem of Galois theory, symmetric functions.
 Spring, 3 credits, ABCF grading

MAT 536 Algebra III

Selections from the following topics: introductory algebraic number theory, introductory algebraic geometry, algebraic groups, cohomology of groups, homological algebra, advanced field theory and Galois theory, central simple algebras, representations of finite and compact groups.
 Fall, 3 credits, ABCF grading

MAT 539 Algebraic Topology

Homology and cohomology groups, homotopy groups and the Hurewicz theorem, the universal coefficient theorem, cup and cap products, Poincare duality, and introduction to spectral sequences.
 Spring, 3 credits, ABCF grading

MAT 540 Topology in Geometry and Algebra I

Cell complexes, algebraic and geometric definitions of homology, fundamental and higher homotopy groups, Hurewicz theorem, Lefschetz theorem and related topics.
 Prerequisites: MAT 530, MAT 531

Fall, 3 credits, ABCF grading

May be repeated for credit

MAT 541 Topology in Geometry and Algebra II

Cohomology, relations with obstruction and deformation theory, Poincare, Lefschetz, and Alexander dualities, intersection theory, relations to differential forms, monodromy, and related topics.
 Prerequisites: MAT 530, MAT 531

Spring, 3 credits, ABCF grading

May be repeated for credit

MAT 542 Complex Analysis I

Elementary functions, holomorphic functions. Cauchy theory, power series, classification of isolated singularities, calculus of residues, open mapping theorem, Riemann mapping theorem.
 Spring, 3 credits, ABCF grading

MAT 543 Complex Analysis II

Monodromy theorem and analytic continuation. Elliptic functions. Dirichlet problem and Green's function. Conformal mappings. Introduction to Riemann surfaces and/or several complex variables.
 Fall, alternate years, 3 credits, ABCF grading

MAT 544 Real Analysis I

Ordinary differential equations; Banach and Hilbert spaces; inverse and implicit function theorems; Lebesgue measure; general measures and integrals; measurable functions; convergence theorems for integrals.
 Fall, 3 credits, ABCF grading

MAT 545 Complex Geometry

Foundational material and techniques in complex algebraic and differential geometry: Review of basic results in several complex variables/analytic geometry, sheaves and cohomology of sheaves, complex vector bundles, Chern classes, positivity, Kaehler manifolds, projective manifolds, Hodge decomposition for Kaehler manifolds, Kodaira vanishing theorem, Hard Lefschetz Theorem, divisors and line bundles, Bertini's theorem, Lefschetz theorem on $(1,1)$ classes, blowing up, Kodaira's embedding theorem.
 Prerequisites: MAT 530-531, MAT 534-535, MAT 542

Fall, 3 credits, ABCF grading

May be repeated for credit

MAT 546 Differential Equations

Distributions and the Fourier transform; compact operators, Fredholm theory; pseudo-differential operators; Sobolev spaces; regularity theory for elliptic operators; Hodge theorem.
 Spring, 3 credits, ABCF grading

MAT 550 Real Analysis II

Representations and decomposition theorems in measure theory; Fubini's theorem; L^p spaces; Fourier series; Laplace, heat and wave equations; open mapping and uniform boundedness theorems for Banach spaces; differentiation of the integral; change of variable of integration.
 Spring, 3 credits, ABCF grading

MAT 551 Real Analysis III

Selections from the following topics. Partial differential equations in higher dimensions; Sobolev spaces, calculus of variations, characteristics, Cauchy problem, energy estimates, maximum principles, Harmonic analysis; singular integrals, Hausdorff measure, harmonic measure, Hardy spaces, Functional analysis; spectral theory, distributions, Banach algebras.
 Fall, 3 credits, ABCF grading

MAT 552 Introduction to Lie Groups and Lie Algebras

Lie algebras, foundations of Lie groups and Lie algebras, classical groups and homogeneous spaces. Abstract Lie algebras. Basic representation theory of compact Lie groups.
 Fall, 3 credits, ABCF grading

MAT 560 Mathematical Physics I

Aimed at students affiliated with the RTG program. Topics include classical field theory (Lagrangian and Hamiltonian), electromagnetism, special relativity, statistical mechanics and thermodynamics, quantum mechanics and quantum field theory.
 Prerequisites: MAT 530, MAT 531

Fall, 3 credits, ABCF grading

May be repeated for credit

MAT 561 Mathematical Physics II

Aimed at students affiliated with the RTG program. Topics include classical field theory (Lagrangian and Hamiltonian), electromagnetism, special relativity, statistical mechanics and thermodynamics, quantum mechanics and quantum field theory.
 Prerequisites: MAT 530, MAT 531

Spring, 3 credits, ABCF grading

May be repeated for credit

MAT 566 Differential Topology

Vector bundles, transversality, and characteristic classes. Further topics such as imbeddings and immersions, intersection theory, surgery, and foliations.
 Fall, 3 credits, ABCF grading

MAT 568 Differential Geometry

Connections, curvature, geodesics, parallelism, and completeness. Riemannian manifolds, geometry of sub-manifolds; method of integral formulas; applications to global extrinsic theorems. Riemannian curvature. Gauss-Bonnet theorem, Hopf-Rinow theorem.
 Fall, 3 credits, ABCF grading

MAT 569 Differential Geometry

First and second variation formulas, conjugate points and Jacobi fields, comparison theory. Curvature and fundamental group: spaces of positive and of negative curvature, space forms, Lie groups, homogeneous spaces, and symmetric spaces. Different topics may be covered depending on the choice of the instructor.
 Spring, 3 credits, ABCF grading

MAT 570 Concepts and Methods of Quantum Mechanics

Mathematical methods of classical mechanics: Lagrangian and Hamiltonian formulations, conservation laws. Mathematical foundation of quantum mechanics: Heisenberg and Schrodinger representations, Stone-von Neumann theorem. Examples of fundamental quantum mechanical problems, representation theory and spin. Feynman path integral formalism and related Wiener theory of integration, perturbation theory, semi-classical approximation, fermion systems. Mathematical applications.

Prerequisites: MAT 544, MAT 551, MAT 552, MAT 568

*Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 588 First-Year Seminar I

Workshop on basic graduate-level mathematics skills and knowledge. Skills include reading and writing proofs, solving problems, reading mathematics. Topics cover fundamental ideas and theories such as constructions of number systems, interchange of limits, the Euclidean algorithm, and the axiom of choice.

Fall, 3 credits, S/U grading

MAT 589 First-Year Seminar II

Same concept as MAT 588, but covers different materials.

Spring, 3 credits, S/U grading

MAT 590 Problem Seminar

Analyze problems and explore supplementary topics related to the core courses in the Professional M.A. Option. Focus on preparation for the doctoral comprehensive examination.

*Fall and spring, 3 credits, S/U grading
May be repeated for credit*

Intermediate Courses

These courses are designed for second- and third-year graduate students who are preparing for the doctoral preliminary examination or are starting work toward a dissertation. Topics covered are chosen to reflect interest of instructors and students. All may be taken for repeated credit. Visit www.math.sunysb.edu for current descriptions.

MAT 598 Teaching Practicum

Seminar and workshop for new teaching assistants.

Fall, 3 credits, S/U grading

MAT 599 M.A. Research

May be repeated for credit

MAT 602 Topics in Algebra

Typical topics are drawn from group theory, ring theory, representation theory of groups and algebras, fields and commutative algebra, homological algebra.

*Fall, 3 credits, ABCF grading
May be repeated for credit*

MAT 603 Topics in Algebra

Typical topics are drawn from group theory,

ring theory, representation theory of groups and algebras, fields and commutative algebra, homological algebra.

Fall, 3 credits, ABCF grading

May be repeated for credit

MAT 608 Topics in Number Theory

Typical topics are drawn from analytic number theory, algebraic number theory, diophantine equations, and transcendental number theory, with indications of methods from algebra, geometry, analysis, and logic.

Fall, 3 credits, ABCF grading

May be repeated for credit

MAT 609 Topics in Number Theory

Typical topics are drawn from analytic number theory, algebraic number theory, diophantine equations, and transcendental number theory, with indications of methods from algebra, geometry, analysis, and logic.

Fall, 3 credits, ABCF grading

May be repeated for credit

MAT 614 Topics in Algebraic Geometry

Topics are drawn from varieties and schemes, algebraic curves, and their arithmetics.

Prerequisite: Permission of instructor

Fall, 3 credits, ABCF grading

May be repeated for credit

MAT 615 Topics in Algebraic Geometry

Topics are drawn from varieties and schemes, algebraic curves, and their arithmetics.

Prerequisite: Permission of instructor

Fall, 3 credits, ABCF grading

May be repeated for credit

MAT 620 Topics in Algebraic Topology

Topics of current interest such as foliations, surgery, singularities, group actions on manifolds, and homotopy theory.

Spring, 3 credits, ABCF grading

May be repeated for credit

MAT 621 Topics in Algebraic Topology

Topics of current interest such as foliations, surgery, singularities, group actions on manifolds, and homotopy theory.

Spring, 3 credits, ABCF grading

May be repeated for credit

MAT 626 Topics in Complex Analysis

Topics selected from Riemann surfaces, quasi-conformal mappings, several complex variables, Fuchsian groups, Kleinian groups, moduli of Riemann surfaces and Kleinian groups, analytic spaces, singularities.

Spring, 3 credits, S/U grading

May be repeated for credit

MAT 627 Topics in Complex Analysis

Topics selected from Riemann surfaces, quasi-conformal mappings, several complex variables, Fuchsian groups, Kleinian groups, moduli of Riemann surfaces and Kleinian groups, analytic spaces, singularities.

Spring, 3 credits, S/U grading

May be repeated for credit

MAT 632 Topics in Differential Equations

Typical topics are hyperbolic or elliptic systems, parabolic equations, spectral theory, finite difference equations, Cauchy-Riemann equations and complex vector fields, equa-

tions with constant coefficients, solvability of linear equations, Fourier integral operators, nonlinear equations.

Spring, 3 credits, S/U grading

May be repeated for credit

MAT 633 Topics in Differential Equations

Typical topics are hyperbolic or elliptic systems, parabolic equations, spectral theory, finite difference equations, Cauchy-Riemann equations and complex vector fields, equations with constant coefficients, solvability of linear equations, Fourier integral operations, nonlinear equations.

Spring, 3 credits, S/U grading

May be repeated for credit

MAT 638 Topics in Real Analysis

Topics selected from functional analysis, harmonic analysis, Banach algebras, operator theory.

Spring, 3 credits, ABCF grading

May be repeated for credit

MAT 639 Topics in Real Analysis

Topics selected from functional analysis, harmonic analysis, Banach algebras, operator theory.

Spring, 3 credits, ABCF grading

May be repeated for credit

MAT 641 Topics in Lie Groups Theory

Typical topics are universal enveloping algebras; free, solvable and nilpotent Lie algebras; Lie theory and formal groups; root systems, Dynkin diagrams, classification and representations of complex semisimple Lie algebras; method of orbits; representations of non-compact Lie groups; loop groups.

Spring, 3 credits, ABCF grading

May be repeated for credit

MAT 644 Topics in Differential Geometry

Typical topics will be drawn from areas such as comparison theorems, pinching theorems, Morse theory, characteristic classes, minimal varieties, Hodge theory, spectrum of the Laplacian, and geometry of general relativity.

Spring, 3 credits, ABCF grading

May be repeated for credit

MAT 645 Topics in Differential Geometry

Typical topics will be drawn from areas such as comparison theorems, pinching theorems, Morse theory, characteristic classes, minimal varieties, Hodge theory, spectrum of the Laplacian, and geometry of general relativity.

Spring, 3 credits, ABCF grading

May be repeated for credit

MAT 648 Topics in Mathematical Physics

Typical topics are mathematical methods of classical and quantum mechanics; methods of functional integration and its applications; infinite-dimensional Lie algebras, quantum groups and representations; conformal field theories; super-symmetry; topological quantum field theories; gauge theories and geometry in four-dimensions; supergravity and mirror symmetry; strings.

Spring, 3 credits, ABCF grading

May be repeated for credit

MAT 649 Topics in Mathematical Physics

Typical topics are mathematical methods of classical and quantum mechanics; methods of

functional integration and its applications; infinite-dimensional Lie algebras, quantum groups and representations; conformal field theories; super-symmetry; topological quantum field theories; gauge theories and geometry in four-dimensions; supergravity and mirror symmetry; strings.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 655 Topics in Dynamical Systems

Typical topics are drawn from holomorphic and low-dimensional dynamics, hyperbolic dynamics, theory of Hamiltonian systems, ergodic theory, and bifurcation theory.

*Spring, 3 credits, S/U grading
May be repeated for credit*

MAT 656 Topics in Dynamical Systems

Typical topics are drawn from holomorphic and low-dimensional dynamics, hyperbolic dynamics, theory of Hamiltonian systems, ergodic theory, and bifurcation theory.

*Spring, 3 credits, S/U grading
May be repeated for credit*

Advanced Courses

These courses are designed for students doing advanced work, especially in connection with doctoral dissertations. The only prerequisite is permission of the instructor. The topics are selected from the areas listed under the corresponding intermediate course and will generally be on a more advanced level. A course normally begins in the fall and may continue in the spring. Course offerings will depend on student demand and availability of faculty to supervise advanced work in the area. Courses may be taken for repeated credit; each carries three credits. Visit www.math.sunysb.edu for current descriptions.

MAT 662 Advanced Topics in Algebra

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 663 Advanced Topics in Algebra

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 666 Advanced Topics in Algebraic Topology

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 667 Advanced Topics in Algebraic Topology

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 670 Advanced Topics in Complex Analysis

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 671 Advanced Topics in Complex Analysis

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 674 Advanced Topics in Differential Equations

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 675 Advanced Topics in Differential Equations

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 678 Advanced Topics in Real Analysis

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 679 Advanced Topics in Real Analysis

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 682 Advanced Topics in Differential Geometry

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 683 Advanced Topics in Differential Geometry

*Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit*

MAT 685 Advanced Topics in Dynamics

An advanced topic selected from holomorphic and low-dimensional dynamics, hyperbolic dynamics, KAM theory, smooth ergodic theory, geodesic flows, bifurcation theory.

*Spring, 3 credits, S/U grading
May be repeated for credit*

MAT 686 Advanced Topics in Dynamics

An advanced topic selected from holomorphic and low-dimensional dynamics, hyperbolic dynamics, KAM theory, smooth ergodic theory, geodesic flows, bifurcation theory.

*Spring, 3 credits, S/U grading
May be repeated for credit*

MAT 690 RTG Seminar in Mathematics and Physics I

Intensive learning seminar aimed at first and second year graduate students. The main purpose is to introduce mathematics students to the methods, language, and modes of thought in modern physics, and conversely to introduce physics students to the same things in modern mathematics. Student participation required. Topics change year to year.

*Fall, 1-6 credits, S/U grading
May be repeated for credit*

MAT 691 RTG Seminar in Mathematics and Physics II

*Spring, 1-6 credits, S/U grading
May be repeated for credit*

Other Courses

Each of the following courses may be taken with the approval of the graduate program director. Courses have variable and repetitive credit. Visit www.math.sunysb.edu for current descriptions.

MAT 696 Mathematics Seminar

May be repeated for credit

MAT 697 Mathematics Colloquium

May be repeated for credit

MAT 698 Independent Study

May be repeated for credit

MAT 699 Dissertation Research on Campus

Dissertation research under direction of advisor.

*Prerequisite: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab. Fall, spring, and summer, 1-12 credits, S/U grading
May be repeated for credit*

MAT 700 Dissertation Research off Campus—Domestic

*Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor. Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

MAT 701 Dissertation Research off Campus—International

*Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if the other plan is deemed comparable); all international students must receive clearance from an International Advisor. Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

MAT 800 Full Time Summer Research

May be repeated for credit

Mechanical Engineering (MEC)

Chairperson: Fu-pen Chiang, Light Engineering Building 105 (631) 632-8311

Graduate Program Director: Peisen Huang, Light Engineering Building 107 (631) 632-8816

Graduate Secretary: Mary Ann Caprari, Light Engineering Building 103 (631) 632-8340

Degrees awarded: M.S. in Mechanical Engineering; Ph.D. in Mechanical Engineering

The Department of Mechanical Engineering, in the College of Engineering and Applied Sciences, offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. The department offers a broad curriculum with concentrations in Thermal Sciences and Fluid Mechanics, Solid Mechanics, and Design and Manufacturing.

Departmental brochures describing specific admission requirements, areas of research, and a more detailed description of the graduate program are available upon request.

Facilities and Areas of Specialization

Design and Manufacturing

Studies include computer-integrated engineering; CAD/CAM; kinematics, robotics, and manufacturing systems; dynamics and vibration; control; design optimization; metrology; microelectromechanical systems (MEMS); and micro/nano-technologies. The analysis and design of mechanical systems, such as high performance machinery and robotic manipulators, and mechanism, includes dynamics, motion, control, and vibration-related problems. Research on optical metrology, 3-D machine vision, and their applications to manufacturing are also being conducted. Applied courses emphasize case studies; finite element methods; and computer graphics; also featured are an array of equipment and software for research and teaching, such as robots, computer vision systems, CAD/CAM station, CMM, desktop rapid prototyping machine, I-DEAS, and AutoCAD.

Solid Mechanics

The mechanical behavior of advanced materials and structures is studied with emphasis on mathematical modeling and simulation of deformation, failure, stability, and microstructural transformation. These issues span a wide range of interests that focus on various materials, systems, and multiple length scales. Research topics include fracture

mechanisms of embedded flaws in coatings and thin films, delamination in composites, and the mechanical properties and behavior of micron-scale structures and systems, such as microelectromechanical systems (MEMS) and microelectronic components. Stability of complex shell structures is studied with emphasis on nonlinear buckling mode interactions, inelastic material behavior, and deformation localization mechanisms observed in shell collapse. Also investigated are the constitutive modeling and failure characterization of ceramics, polymers, and heterogeneous multi-component materials, and nano- and micromechanics of defect formation and motion in bulk materials and thin films.

Experimentally based research programs focus on the mechanical, thermomechanical, and failure behavior of a wide variety of materials such as metals, polymers, ceramics, and composites under both static and dynamic loading conditions. Optical techniques of strain analysis including moiré methods, laser and white-light speckle methods, holographic interferometry, photoelasticity, and classical interferometry are developed and applied to solid mechanics problems such as fracture, wave propagation, metal forming, vibration, and deformation of micron-scale structures and systems such as MEMS. Research is also conducted to characterize the failure mechanics of various engineered heterogeneous materials systems, ranging from functionally layered/graded coatings to nanocomposites under impact loading and high-temperature conditions. Specialized equipment includes high-speed digital cameras, scanning electron microscope, and split Hopkinson pressure bars.

Thermal Sciences and Fluid Mechanics

Fluid Mechanics

Current topics include advanced combustor design and flow control, and the behavior of chemically reacting species in turbulent flows. Numerical and theoretical studies include direct simulation

of turbulent flows and turbulent transport at modest Reynolds numbers, stochastic modeling of the turbulent transport of temperature, and spectral closure approximations for chemically reactive flows. Current experimental research facilities include a water tunnel and channel, wind tunnels, and a heated jet. Instrumentation available includes laser-Doppler and fluorescence systems.

Heat Transfer

The concentration in heat transfer consists of advanced studies in the fundamentals and applications of heat conduction, convection and thermal radiation, fluid mechanics, numerical analysis, thermodynamics, and experimental techniques. Ongoing research includes measurement of thermophysical properties, laser-material interaction, materials processing, and heat transfer in advanced energy systems. Active research is also conducted on various aspects of crystal growth (e.g., modeling, simulation, material characteristics, process control, and system design), advanced sensors, photovoltaic technology, hydrate system, nuclear fuels, fuel cells, wind energy, and biomass energy.

The integrated crystal growth and wafer manufacturing research facility consists of an industry-scale high-pressure system for synthesis and growth of III-V compound semiconductor crystals. The ultra fast thermal processing and laser-based measurement laboratory has a Ti:sapphire oscillator/regenerative amplifier, a high-speed digital oscilloscope, a femtosecond autocorrelator, and a host of fast optoelectronics and light sources. The thermal sciences research laboratory has a visualization and digital image processing system. The solidification and interfacial science laboratory contains a Bridgman crystal growth system, a surface energy analysis and measurement system, and a Labview-based data acquisition system.

Thermodynamics

The design of heat engines, as well as most industrial processes that involve

HPH 513 Decision Analysis

This course will focus on the principles of decision analysis and medical decision-making; the use of probabilities and utility assessment in medicine; choice and interpretation of diagnostic tests; decision tree construction and analysis; sensitivity and threshold analysis; quantifying patient preferences; and cost-effectiveness analysis. Students will learn methodologies for dealing with complex decisions both on an individual patient level and at a policy level, and will have hands-on experience in applying these to a problem of their choice.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HPH 517 Continuous Quality Improvement Methods

This course introduces the principles and methods of continuous quality improvement (CQI) for public health and health care organizations including benchmarking, development of pertinent information systems, timely and regular analysis of data, and presentation of performance results. The course also discusses implementation issues including availability of relevant data and achieving administrative and staff support.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HPH 519 Independent Study

Intensive reading, under supervision of one or more instructors, of material not covered in the formal curriculum, or execution of a research project under the supervision of one or more faculty members.

Prerequisite: Permission of program director
1-6 credits, ABCF grading
May be repeated 5 times for credit

HPH 521 Seminar in Evaluative Sciences

This course introduces novice researchers to the steps required to plan a clinical research project and teaches some of the most basic principles involved in each step. This 8-hour seminar will discuss reviewing the literature and building a library; developing a research project including study design, sampling, data collection and management, data analysis, and presenting results. Grant resources and the application process; copyright rules; human subjects protection and institutional review boards (including HIPAA); and when and how to use a statistics consultant will also be introduced. Students are encouraged to use this seminar to develop their own research idea and leave the seminar with a timeline for achieving their own research goals.

ABCF grading

May be repeated 3 times for credit

HPH 528 Survey Research Methods

This course will introduce survey research methods for community populations. It will include measurement of health status and other factors related to the health of community populations including socioeconomic status, health behavior, occupation, and social support. Topics will include sampling and design strategies, instrument development, scaling, assessment of reliability, validity and responsiveness to change; principal

Component(s): analysis and factor analysis; and item response theory. The course will introduce students to the many existing sources of community health survey data including the recurrent national surveys such as the National Health Interview Survey.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HPH 539 Global Epidemiology and Preventive Medicine

This course focuses on strategies to reduce mortality and morbidity from specific conditions. The conditions selected are mainly infectious diseases that account for the majority of preventable deaths and disability in low-income countries, especially among children. Detailed discussion of disease due to protozoa and parasites will, however, be deferred to another course. In addition, the increase in mortality from tobacco-related disease and trauma in poor countries will also be addressed.

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HPH 540 Medical Anthropology, Culture, and Ethics

This course focuses on how patients in non-western societies view issues related to health and disease and how medical interventions can be integrated into local beliefs and customs. Particular attention will be devoted to the role of women in improving the health status of their communities. Region-specific overviews will be provided on how history and culture have influenced health in sub-Saharan Africa and Latin America. Ethical issues related to resource allocation and medical and public health research in low income countries will also be addressed in this course.

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HPH 541 Provision of Health Care in Low Income Countries

This course focuses on the practical implementation of interventions to reduce disability and premature death in low income countries. It will cover funding and organization of health care; primary health care programs; role of expatriate health workers; and emergency medical care of refugee populations.

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HPH 542 Introduction to Global Health

This course will provide health personnel with a basic awareness of the problems of the worlds' population with special focus on the poorest. To promote these objectives, this course has been designed to introduce medical and public health students to key population health topics from a global perspective, with special emphasis placed on the health and welfare of women and young children in low-income countries. The health impact of emergent infectious diseases will be reviewed. The design and effectiveness of foreign aid programs will be discussed. Students will be introduced to demography and the impact of

population increases on the global environment. There will be discussions of the health problems of immigrants to the U.S. from tropical countries. Finally students will learn about vaccination and other safety issues related to traveling and working in the tropics.

2 credits, ABCF grading

HPH 544 Development and Demography

This course focuses on broad issues of international aid and development policies that impact human health and the global environment. The course will help place the specific clinical interventions discussed in other courses into a wider socioeconomic context. Topics will include demography, poverty, health, and development; international and U.S. AID policies; and global environment for sustainable development

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HPH 545 Clinical, Laboratory, and Epidemiological Parasitology and Protozoology

This is an integrated and detailed course on the subjects of parasitology and protozoology. The epidemiology, microbiology, clinical presentation, and management, as well as laboratory diagnosis, of these conditions will be covered. The human and economic impact of these conditions will be discussed. Preventive measures will be discussed in detail. It will be assumed that students have minimal or no prior knowledge of these conditions.

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HPH 561 Design of Scientific Investigations

This course is an overview of the theory and methods relevant to health sciences research, beginning with the philosophy of scientific investigations, the role of literature in the advancement of science and moving to problem identification, formulation of research questions, research design, and issues of sampling and sample selection, measurement, and analysis.

1 credit, ABCF grading

HPH 564 Research Methods for Community Populations

This course will introduce the design, measurement, and analysis of research for community populations. It will include measurement of health status and other factors related to the health of community populations including socioeconomic status, health behavior, occupation, and social support. Topics will include instrument development, scaling, assessment of reliability, validity and responsiveness to change; principal component analysis and factor analysis; and item response theory. The course will introduce the many existing sources of community health information including the recurrent national surveys such as the Health Interview Survey.

2 credits, ABCF grading

HPH 566 Clinical Trials

This course introduces the design, conduct, and analysis of clinical trials. Topics will include types of clinical trials, study design, treatment allocation, randomization and

stratification, quality control, sample size requirements, patient consent, and interpretation of results.

2 credits, ABCF grading

HPH 568 Overview of Molecular Medicine and Genomics

The course will introduce basic concepts of molecular diagnostics currently in clinical use. The principal topics to be covered include: an introduction to the human genome; principles of human genetics; microarray, genomic and bioinformatics approaches to human disease; cancer genetics; animal models of human diseases; emerging pathogens; principles of genetic testing strategies and test development; emerging molecular therapeutics; regulatory, patenting and licensing issues of relevance to drug discovery and test development.

2 credits, ABCF grading

HPH 569 Modeling for Evaluative Sciences

This course will present an introduction to the methods of data mining and predictive modeling, with particular emphasis on applications to health services research and clinical outcomes research. Basic concepts and philosophy of data mining as well as appropriate applications will be discussed. Topics covered will include multiple comparisons adjustment, and predictive model building through logistic regression, classification and regression trees (CART), multivariate adaptive splines (MARS) and neural networks.

2 credits, ABCF grading

HPH 570 Multilevel and Longitudinal Analyses

The course covers methods for the analysis of repeated measures, correlated outcomes and longitudinal data, including the unbalanced and incomplete data sets characteristic of health service research. Topics include ANOVA, random effects and growth curve models, and generalized linear models for correlated data, including generalized estimating equations.

2 credits, ABCF grading

HPH 571 Research Synthesis and Meta Analysis

This course concerns the use of existing data to inform clinical decision-making and health care policy. The course focus is research synthesis (meta-analysis). The principles of meta-analytic statistical methods are reviewed, and the application of these to data sets is explored. Application of methods includes considerations for clinical trials and observational studies. The use of meta-analysis to explore data and identify sources of variation among studies is emphasized, as is the use of meta-analysis to identify future research questions.

2 credits, ABCF grading

HPH 620 Parameters of Social and Health Policy I

Introduces students to U.S. social policy, with a special emphasis on political, economic, and social factors that have affected its historical development, particularly in reference to oppressed groups. Explores relationship of social policy to social work practice.

3 credits, ABCF grading

HPH 621 Parameters of Social and Health Policy II

Utilizes frameworks for social policy analysis. Explores continuing dilemmas in policy development. Stresses effects of social movements and social change on social policy.

Prerequisite: HWC 509

3 credits, ABCF grading

HPH 624 Youth and Violence

Examines the etiology of youth at risk for violence, using ecological and interpersonal perspectives. Family, school and community risk factors are outlined as well as assessment, intervention and treatment issues. Successful prevention programs are highlighted.

2 credits, ABCF grading

HPH 625 Children of Chaos: The Social Worker's Role

Designed to provide an understanding of the special issues and concerns surrounding work with children. Professional dilemmas and guidelines to aid practice are identified. Special issues involved in work with young children are highlighted. Although the focus is on direct work with children, a family-centered approach is presented. Practitioner roles, the impact of service settings, policy and legislation affecting this area of practice are reviewed as is the knowledge base that serves to guide practice, including formulations of practice theory and empirical research findings. Co-scheduled with HWC 342 and HWC 542.

2 credits, ABCF grading

HPH 626 Overview of Substance Abuse

An examination of the history and development of alcohol and substance abuse problems in the United States. Focuses on the etiology, psychopharmacology and legal ramifications of the use of licit and illicit substances in our culture. Provides information on a variety of services available to drug abusers, addicted individuals and their families in the fields of prevention, education and treatment.

2 credits, ABCF grading

HPH 630 Chemical Dependency in Special Populations

Covers alcoholism and substance abuse with populations that have been traditionally devalued and oppressed. Focuses on development of skills and sensitivity to the needs of ethnic groups, women, the elderly, the mentally ill and gay and lesbian people who are chemically dependent. Explores policy and practice issues related to these populations.

2-3 credits, ABCF grading

HPH 631 Cultural Competency: An Ingredient in Enhancing Treatment Outcomes

Demonstrates that cultural competency, like computer literacy, is a necessity. Outlines how prevention messages and treatment modalities provided within a cultural context are likely to change attitudes or redirect behaviors. There is a new wave of immigrants and a growing assertion of cultural identity by groups who were born in the United States. Therefore, a new communication edict of cultural dialogue is fast becoming part of one's professional mandate. Hence, the ability to interact with people who are

culturally different from the professional is a prerequisite to providing culturally competent services to these groups. Co-scheduled with HWC 357.

2 credits, ABCF grading

HPH 632 Psychopathology and Psychopharmacology

An overview of the DSM IV(TM) system of Classification of Mental Disorders. Emphasizes the social work component within the interdisciplinary team. Special emphasis on assessment. Introduces psychopharmacology and the social work role related to drug management including side effects, risks and changes over time. Critiques value systems involved in diagnosis and definition of disorders.

Prerequisites: HWC 504-505 or permission of instructor

2-3 credits, ABCF grading

HPH 633 Childhood Sexual Abuse and Long-Term Sequelae: Assessment and Intervention

Introduces students to the incidence and prevalence of childhood sexual abuse as a national problem. Covered are definition issues, sequelae during childhood, family constellation and adult sequelae. Addressed are assessment and current treatment modalities, particularly for families and offenders, ethical and legal dilemmas and the subsequent health related difficulties of this childhood trauma. Special attention is paid to the cultural dynamics in sexual abuse. Students are expected to develop an awareness of and critically analyze current research. Focus is also on examination of policy issues and legislation.

2-3 credits, ABCF grading

HPH 634 Program Evaluation

Provides an in-depth analysis of the technical requirements of program evaluation and the organizational and political constraints that influence the evaluation process. Covers techniques in the design and implementation of evaluation research in the health and human service fields.

Prerequisites: HWC 511 and 512

2-3 credits, ABCF grading

HPH 635 Seminar on Family Violence

An overview of the phenomenon of family violence in the United States including child abuse, partner abuse and elder abuse. Explores theories of etiology, including patriarchy, intergenerational family dynamics and substance abuse. Examines programmatic approaches including the legal system and programs for batterers by utilizing guest speakers from Suffolk County agencies.

2 credits, ABCF grading

HPH 636 Community Analysis and Health Promotion

Explores diverse concepts of community, analyzes a range of community structures, processes, and power relationships. Investigates contemporary models, strategies and tactics of community organizing and health promotion in the United States and in selected other countries. Emphasizes efforts by poor people, ethnic minorities of color and women to organize and mobilize community groups and movements. Highlights group and

community analysis and organization skills.

2-3 credits, ABCF grading

HPH 638 Qualitative Health Research

Methods

The class works as a team on a joint project. Topics include problem formulation, instrument construction, sampling strategy, interviewing, data transcription and data analysis.

Prerequisites: HWC 511 and 512

2-3 credits, ABCF grading

HPH 644 Epidemiology of Environmental and Occupational Disorders

This course is the study of the interrelationships of factors that determine environmental/occupational disease frequency and distribution for both the general population and specific work groups. Coscheduled as CEM 522 or HPH 644.

Prerequisite: Permission of instructor (priority will be given to those who need to complete certificate requirements or work in the field)

3 credits, ABCF grading

HPH 645 Occupational Health Principles

An introduction to the history and effect of occupational health issues will be the focus of this course. Topics include the role of regulatory agencies, vectors of health hazards, specific monitoring techniques, ergonomics, radiation, indoor air pollution, and methods of protection. Coscheduled as CEM 525 or HPH 645.

3 credits, ABCF grading

HPH 646 Continuous Quality Improvement in Healthcare

Provides basic principles associated with Total Quality Management (TQM) and Continuous Quality Improvement (CQI). Aids identification and quality problem-solving found in all healthcare organizations utilizing continuous quality improvement (CQI) tools and techniques. Through the use of case studies, current events, and textbook materials, students will learn how to identify problems, recommend improvements, and collect data to demonstrate process improvement. Restricted to students approved for appropriate senior year track in the Health Science major. Coscheduled as HAN 436 and HPH 617.

3 credits

HPH 647 Environmental Toxicology

This study of the effects of environmental pollutants and hazardous wastes on the human body will examine the health risks to each body organ system as well as the short-term effects and long-term consequences for the species. Coscheduled as CEM 527 or HPH 647.

3 credits, ABCF grading

HPH 648 Industrial Hygiene

This course is designed to give students a basic understanding of industrial hygiene and the building blocks to further their interests within the safety/environmental fields. The principles discussed will include the application of investigative principles and the use of equipment to determine the nature and extent of potential environmental hazards and to design a plan of correction to abate the situation. This may include engineering and

administrative controls as well as recommendations for personal protective equipment. Finally, there will be a review of the agencies involved and relevant safety and health regulations for students to apply these principles. Priority will be given to students completing a graduate certificate program or to candidates who work in the field. Coscheduled as CEM 538 or HPH 648.

3 credits, ABCF grading

HPH 649 Health Physics

The course is the study of health physics, integration of radiation with matter, radiation dosimetry, biological effects of radiation and radiation protection. The course will emphasize both the theoretical and operational aspects of health physics. Coscheduled as CEM 539 or HPH 649.

Prerequisite: Permission of instructor

3 credits, ABCF grading

HPH 650 Safety Engineering and Management

This course provides a knowledge of the fundamentals of occupational and environmental safety, including safety engineering regulations, codes and practices, safety program administration, recognition of hazards, and implementation of hazard controls. This course is essential to safety professionals, engineers, business managers, health care professionals and to individuals who are entering the field of health and safety. (Formerly titled Occupational Accident and Injuries; may not be taken for repetitive credit; priority will be given to those students who are completing the graduate certificate program or to candidates who work in the field; this course is part of the certificate program.) Coscheduled as CEM 541 or HPH 650.

3 credits, ABCF grading

HPH 652 Occupational Safety and Health for Special Groups

While there are many environmental hazardous aspects in the workplace, work populations are affected by agents specific to the nature of the occupations. The risk of those exposed requires special knowledge, monitoring and regulations. This course will address the occupational health and safety issues surrounding populations known for their population size, diversity, and magnitude of exposure. Coscheduled as CEM 543 or HPH 652.

3 credits, ABCF grading

HPH 653 Introduction to Homeland Security

The course is a combination of lectures and laboratory experience to introduce students to critical issues and assess needs for homeland security. The course includes invited lectures by experts on special topics such as fundamentals of nuclear, chemical, and biological weapons and the associated threat to the transportation of goods and the public. The students will learn about cyber security, devices to safeguard materials from terrorist threats, safety of nuclear power plants and water supply, forensics and emergency preparedness. The students will submit a term paper on a selected topic in lieu of the final exam. Crosslisted with ESM 550 and HPH 643.

Fall and spring, 3 credits, ABCF grading

HPH 654 Nuclear Security

The course is intended to familiarize students with the fundamentals of nuclear physics, radiation, mining, weapons and fuel cycle, other than producing electricity, as it pertains to nuclear power plants. Topics include nuclear detection, devices to safeguard nuclear materials from terrorist threats, needed physical protection for safe handling and its relevance to Homeland Security. The course combines lectures with hands-on experience at the newly installed nuclear detection facility located at the nearby United States Department of Energy's Brookhaven National Laboratory. Crosslisted with ESM 553 and HPH 646.

Spring, 4 credits, ABCF grading

HPH 655 Chemical and Biological Weapons: Safeguards and Security

This course deals with the fundamentals of chemistry and biochemistry related to chemical weapons (CW) and biological weapons (BW) that could be used by terrorists. Topics include CW and BW history, production, control, detection, identification, and emergency response measures to deal with intended or unintended release and escape, and security measures to protect and control stockpiles. Crosslisted with ESM 554 and HPH 653.

Spring, 4 credits, ABCF grading

HPH 656 Risk Assessment, Regulation, and Homeland Security

The course focus is on risk assessment associated with nuclear, chemical and biological weapons as it relates to Homeland Security. Topics include air dispersion, uncertainty analysis, exposure measurements, epidemiology, toxicology, regulatory issues, risk management, risk communication, risk perception, and risk preparedness. The course will also cover laws and regulation, discouraging terrorism, and disaster preparedness, various acts passed by the U.S. Congress to regulate water, air, and controlled substances. Crosslisted with ESM 560 and HPH 656.

Fall and spring, 4 credits, ABCF grading

HPH 657 Demographic Economics I

This course deals with the economics of the family. It utilizes recently developed techniques in economics and demography to deal with questions concerning marriage, divorce, fertility, contraception, the intrafamily distribution of resources, and the intergenerational distribution of resources. Students will do original theoretical and empirical research under the professor's supervision.

Spring, 0-3 credits, ABCF grading

HPH 658 The Use of Remote Sensing and GIS in Environmental Analysis

An introduction to the use of aerial and satellite imagery in environmental analysis and the manipulation of geographic data sets of all types using Geographic Information Systems. This course is designed to teach students in archaeology, physical anthropology, and related disciplines, how satellite imagery combined with various maps can be manipulated using GIS software to perform powerful geographic analysis. Although students are eventually likely to use these tools in many different parts of the world, this course focuses on Long Island as a research

area, and each student designs and completes a research project on a particular section of the area, focusing on the habitats of local wildlife, the locations of archaeological sites, coastal regimes, etc. This course presumes computer literacy and familiarity with database management. This course is offered as both ANT 526 and DPA 526, and is coscheduled as HPH 658.

Spring, 3 credits, ABCF grading

HPH 659 Biology of Cancer

A short course with the emphasis on cancer as a disease of man. Lectures address human cancer as seen by the clinician and as basic research relates to human disease. This course provides students with a link between courses in cell and molecular biology and the application of this basic information to tumor management.

*Spring, even years, 1 credit, ABCF grading
May be repeated for credit*

HPH 661 Methods of Socio-Technological Decision Making

Application of decision-making techniques to analyze problems involving technology, particularly its social impacts. Areas of study include decision making under uncertainty, decision making in a passive vs. active environment, sequential decisions, estimating payoffs, forecasting, and technology assessment. These systems-analysis techniques are used to formulate and solve a variety of socio-technological problems, especially those that arise in educational, industrial, and environmental professions.

*Prerequisite: Graduate standing in department or permission of instructor
Fall, 3 credits, ABCF grading*

HPH 662 Systems Approach to Human-Machine Systems

Systems concepts (feedback, stability, chaos, ergonomics) and analytical tools applied to dynamic systems in which technologies and/or natural environments interact with human users, regulators, or designers. Examples: ecological systems, nuclear power plant operations, space shuttle missions, computer/web educational technologies, regional planning. Students prepare a systems design study of an industrial, educational, or environmental device, technology, or management system.

*Prerequisite: EST 581 or permission of instructor; graduate standing in the department
Spring, 3 credits, ABCF grading*

HPH 663 Waste Management: Systems and Principles

Students will learn about the technologies and policy options in waste management, emphasizing recycling, incineration, landfilling, and source reduction options for municipal solid waste on Long Island. Problems concerning paper, glass, plastic, organic materials, and other waste stream components will be explored. Environmental impacts and economics of landfills, materials recovery facilities, and waste-to-energy systems. The institutional and regulatory climate. Current and planned practices in the region. Hazardous waste. This course is offered as both CEY 597, EST 597 and HPH 641.

3 credits, ABCF grading

HPH 664 Economics of Health

Theoretical and econometric analysis of selected aspects of the health care delivery system, such as the demand for medical services, the supply and distribution of physician services, the utilization of non-physician medical personnel, alternative models of hospital behavior, third-party insurance reimbursement, national health insurance and cost, and price inflation in the hospital and long-term care sectors. Coscheduled as ECO 646 or HPH 664.

Spring, 0-3 credits, ABCF grading

HPH 665 Health Economics

This course applies advanced economic theory and econometrics to issues within the health market in more detail. Theoretical and econometric analysis of the health care delivery system, such as the demand for medical services, the supply and distribution of physician services, hospital behavior, third-party insurance reimbursement, national health insurance and cost, price inflation, and welfare economics and policy analysis. Co-scheduled with ECO 645.

2 credits, ABCF grading

HPH 671 Marine Pollution

Review of the physical and chemical characteristics and speciation in the marine environment of organic pollutants, metals and radionuclides including bioavailability, assimilation by marine organisms, toxicity, and policy issues. Coscheduled as MAR 512 or HPH 671.

Fall, 3 credits, ABCF grading

HPH 672 Marine Management

The course discusses waste management issues particularly affecting the marine environment. Topics include ocean dumping, sewage treatment fish kills, beach pollution, and nuisance algal blooms. Techniques for managing the waste stream are presented.

Spring, 3 credits, ABCF grading

HPH 673 Groundwater Problems

Discussion of the hydraulic processes and technologies that are central to the management and monitoring of groundwater resources including special problems of coastal hydrology and saltwater intrusion, as well as the fate of contaminants. Remediation approaches are also examined. Coscheduled as MAR 521 or HPH 673.

*Prerequisite: Permission of instructor
Summer, 3 credits, ABCF grading*

HPH 675 Environment and Public Health

Review of the interactions of humans with the atmosphere and water resources, especially in the Long Island coastal community. An introduction is provided to the field of environmental health and the practices relevant to an urban/suburban and coastal setting. Coscheduled as MAR 525 or HPH 675.

Spring, 3 credits, ABCF grading

HPH 676 Environmental Law and Regulation

This course covers environmental law and regulations from inception in common law through statutory law and regulations. The initial approach entails the review of important case law giving rise to today's body of environmental regulations. Emphasis is on environmental statutes and regulations deal-

ing with waterfront and coastal development and solid waste as well as New York State's Environmental Quality Review Act (SEQRA) and the National Environmental Policy Act (NEPA). Coscheduled as MAR 536 or HPH 676.

Spring, 3 credits, ABCF grading

HPH 683 Air Pollution and Air Quality Management

The effects of air pollution on the environment and public health are explored. Primary pollutants, such as particulates, oxides of sulfur, nitrogen and carbon, hydrocarbons, lead and CFCs are considered, as are secondary pollutants, such as sulfuric acid, PAN, and surface ozone. The effect of atmospheric conditions on the dilution and dispersion of pollutants and the impact of pollution on the global atmosphere are explained. Air pollution disasters and the impacts and ramifications of the Clean Air Act of 1970, its 1990 amendments, and recent international accords are discussed. Case studies of air pollution reduction, management, and regulation in local industry are included. Other contemporary topics include the loss of stratospheric ozone and global warming due to man's activities. Coscheduled as EST 584 or HPH 683.

Spring, 3 credits, ABCF grading

HPH 684 Environmental and Waste Management in Business and Industry

Environmental and waste management practices in industrial and other institutional settings. Technologies of hazardous waste prevention, treatment, storage, transportation, and disposal. Information systems and software tools for environmental audits, regulatory monitoring and compliance, and cost estimation. Recycling programs, air, land and water emissions controls and permits. Employee health, safety, and education; quality management. Field trips to several Long Island institutions. Coscheduled as EST 586 or HPH 684.

3 credits, ABCF grading

HPH 686 Risk Assessment and Hazard Management

A case-study approach to the assessment of risk and the management of natural and technological hazards, with emphasis on those that can harm the environment. The course focuses on technological hazards involving energy, transportation, agriculture, natural resources, chemical technology, nuclear technology, and biotechnology, and on natural hazards such as climatic changes, droughts, floods, and earthquakes. The first part of the course consists of readings on risk assessment and hazard management and discussions of published case studies. During the second part of the course, students conduct their own case studies and use them as the basis for oral and written reports. Coscheduled as EST 593 or HPH 686.

Spring, 3 credits, ABCF grading

HPH 687 Diagnosis of Environmental Disputes

Diagnosis of disagreements about environmental and waste problems. Tools for evaluating disputes about (1) scientific theories and environmental models, (2) definitions and

analytical methodologies for estimating risk, "real" cost, net energy use, and life-cycle environmental impact, (3) regulatory and legal policy, (4) siting of controversial environmental facilities, and (5) fairness and other ethical issues. These diagnostic tools are brought to bear upon case studies of pollution prevention, recycling, nuclear waste disposal, and climate change. This course is offered as CEY 594, EST 594, and HPH 687.

3 credits, ABCF grading

HPH 688 Principles of Environmental Systems Analysis

This course is intended for students interested in learning systems engineering principles relevant to solving environmental and waste management problems. Concepts include compartmental models, state variables, optimization, and numerical and analytical solutions to differential equations.

Fall, 3 credits, ABCF grading

HPH 689 Simulation Models for Environmental and Waste Management

This course is intended for students interested in developing computer models for technology assessment and for environmental and waste management. Concepts developed in EST 595 Environmental Systems Engineering and Analysis are applied to real-world problems. Techniques in model development are presented in the context of applications in surface and groundwater management, acid rain, and health risks from environmental contamination. Coscheduled as EST 596 or HPH 689.

Spring, 3 credits, ABCF grading



School of Social Welfare

Dean: Frances L. Brisbane, Health Sciences Center, Level 2, Room 093 (631) 444-2139

Graduate Program Director: Linda Francis, Health Sciences Center, Level 2, Room 093 (631) 444-3174

Doctoral Program Director: Joel Blau, Health Sciences Center, Level 2, Room 093 (631) 444-3149

Administrative Assistant for Master's Program: Kathy Albin, Health Sciences Center, Level 2, Room 093 (631) 444-3141

Administrative Assistant for Doctoral Program: Edie Lundgren, Health Sciences Center, Level 2, Room 093 (631) 444-8361

Degrees awarded: M.S.W. in Social Work; M.S.W./J.D. (with Touro Law Center); Ph.D. in Social Welfare

The M.S.W. Program in Social Work

The School of Social Welfare offers an accredited two-year graduate program and a one-year advanced standing option (open only to students who are graduates of a CSWE accredited baccalaureate program) leading to the Master of Social Work degree, which prepares students for entry into advanced social work practice.

The M.S.W. program provides students with the needed theoretical and practice expertise needed to function with maximum competence at different administrative or policy levels in social welfare and in the provision of direct services to individuals, families, groups, and communities. The school provides opportunities for study and practice that utilize the wealth of interdisciplinary resources available in the Health Sciences Center and the University. The curriculum provides for a general foundation year of courses and field instruction for all students. In the second year, students concentrate in advanced social work practice. Field instruction practicum sites are located throughout Nassau and Suffolk counties and in some of the boroughs of New York City. In addition, the program offers one specialization in health with sub-specializations in alcohol and substance abuse or public health, and another specialization in student-community development.

In addition to the regular full-time two-year program, the school has two alternative pathways that extend the time necessary to achieve the degree. Students who are employed in the field of social welfare may, under certain conditions, use their employment site to fulfill a part of the field instruction requirements. Some courses are offered in concentrated form during the semesters, intersession, and summer session.

A separate bulletin is available describing the M.S.W. program curriculum and requirements for admission. To receive a copy of this bulletin and further information, contact:

Office of Admissions and Student Services
School of Social Welfare
Health Sciences Center
Stony Brook University
Stony Brook, NY 11794-8230
(631) 444-3141

Apply online for the M.S.W. program at www.uhmc.sunysb.edu/studserv/apply/hsc.html.

Dual Degree Program in Social Work and Law

This program offers the opportunity to earn an M.S.W. from the School of Social Welfare and a Juris Doctor (J.D.) from Touro Law Center in four years rather than in the five that would be required if the degrees were earned separately. Applicants may apply for the dual-degree program prior to matriculation or during their enrollment in the first year at either school. Applicants must apply to and be accepted by both schools. If accepted by both schools, the student is automatically eligible for the dual-degree program. The first year may be spent at either school, with the choice being up to the student. The second year is spent at the other school, the third year is divided between the two schools, and the fourth year is spent primarily at the law school. A detailed description of the program is available through the School of Social Welfare's Admissions and Student Services Office.

The Ph.D. Program in Social Welfare

The primary purpose of the Ph.D. program is to produce scholars who can use systematic methods to develop through research, and disseminate through teaching and writing, knowledge concerning social welfare problems and professional social work practice. Professional social work practice includes direct service with clients, the organization and management of service delivery systems, and the formulation and analysis of social welfare policies.

Drawing upon the social, behavioral, and health sciences as well as social work knowledge and experience, the graduates of this program will have the skills to expand the base of tested knowledge that can guide the profession of social work in its efforts to address major social problems.

A second purpose is to develop leaders and educators who can effectively contribute to contemporary social work practice as defined in this school's mission statement.

The core of this program is education for scholarly research leading to careers as teachers, researchers, and policy analysts with a focus on the content areas of health, mental health, and substance abuse. The strength of such a program lies in its location within the Health Sciences Center. This is a natural setting in which to bring together the basic sciences and theoretical disciplines in applied policy/program analysis and thereby contribute to research in the social dimensions of health and mental health.

Program Structure and Content

The structure of this program consists of 12 required classroom courses (36 credits) as follows:

- Statistics I and II
- Research Methods I and II
- Social Welfare Policy Analysis I and II
- Social Welfare Administration
- Knowledge Building in Social Work: The Philosophy of Applied Social Research
- Theories of Social Work Intervention
- Seminar in Social Work Education
- Dissertation Seminar I and II

Also required are three electives (9 credits), a research practicum of 10 hours per week for two semesters under mentorship (6 credits), a teaching practicum under mentorship (3 credits), oral and written qualifying examinations,

a scholarly paper of publication quality, and the production and defense of a scholarly dissertation. Fifty-four credits are required for graduation. In the first three years, students take three courses each semester. The full-time program is designed to be completed in a minimum of four years. The scholarly research paper of publication quality is required at the end of the fourth semester.

A comprehensive examination is given when 36 credits of required coursework are completed. Once all coursework and the qualifying exams are completed successfully, students select a preliminary dissertation chair and committee and develop an approved dissertation proposal. The student is then advanced to candidacy and begins dissertation research. The fourth year is spent on completion of the dissertation and defense.

The Part-Time Option

Students who are approved for the part-time option take a minimum of six credits each semester until the 54-credit sequence has been completed. In order to meet residence requirements, they must take nine credits in each of two consecutive semesters. Part-time students sit for their qualifying examinations at the end of the semester when 36 credits of required coursework are completed (usually the second semester of the third year). At the end of the third year, once all coursework and the qualifying exams are completed successfully, part-time students submit a research paper of publication quality for their oral exam. In the fourth year, they develop an approved dissertation proposal and select a dissertation sponsor. They are then advanced to candidacy. Dissertation research begins in the fifth year.

Criteria and Procedures for Student Admission

Newly admitted students may begin classes during the fall semester only. Applications for admission the following fall should be received by February 1.

Admission requirements include:

A. A master's degree from a program accredited by the Council of Social Work Education;

B. Academic promise as evidenced by superior achievement in undergraduate and master's level education;

C. Satisfactory performance on the Graduate Record Examination;

D. A personal interview;

E. Professional competence as demonstrated through substantial experience in responsible social work and/or human services positions supported by three letters of reference including one, if possible, from someone familiar with the applicant's capacity to conduct research;

F. A sample of writing in the form of a published article, a manuscript submitted for publication, a document completed for the applicant's agency or in connection with a research interest, or a paper prepared in your previous graduate studies;

G. Personal qualities indicating a potential for leadership, compatibility with the School's mission statement, flexibility and openness to new ideas, maturity, a spirit of inquiry, and a commitment to furthering the knowledge base of the profession of social work;

H. Competence in quantitative skills as evidenced by performance on the Graduate Record Exam and a college level course in statistics completed with a grade of B or better;

Under special circumstances, applications from persons who do not meet all of these requirements will be considered. Applicants without the M.S.W. degree must have a master's degree in a closely related field and must demonstrate a high potential for success in the program.

Requirements for the Ph.D. Degree

A. One year in residence;

B. Satisfactory completion of all required and elective courses (54 credits);

C. Satisfactory completion of research and teaching practicum;

D. Submission of a research paper of publication quality prior to the qualifying examinations;

E. Satisfactory performance on the qualifying examinations;

F. Advancement to candidacy by vote of the doctoral committee upon successful completion of all coursework and the qualifying examinations;

G. Completion of a dissertation;

H. Successful defense of the dissertation.

I. Completion of all work toward the degree within seven years after

admission to the program.

A separate application and bulletin are available describing the Ph.D. program in more detail, its curriculum, and requirements for admission. To receive a copy of this bulletin, application, and further information, contact the School of Social Welfare's Ph.D. program office in writing or by telephone at (631) 444-8361.

Faculty

Professors

Blau, Joel, *Director of the Ph.D. Program.*

D.S.W., Columbia University: Social policy; history of social welfare; poverty; homelessness; the political economy of social welfare; comparative social welfare.

Brandwein, Ruth, Ph.D., Brandeis University: Family violence, welfare, and poverty; women in administration; organizational and social change; single-parent families; feminist frameworks; history of U.S. social policy; international social welfare.

Brisbane, Frances, *Dean.* Ph.D., Union Graduate School: Alcoholism; counseling with people of color; complementary medicine.

Farberman, Harvey A., Ph.D., University of Minnesota: Philosophy of social work; public mental health services; research.

Lurie, Abraham, Ph.D., New York University: Mental health; case management; the aged.

Associate Professors

Berger, Candyce S., Ph.D., University of Southern California: Health policy; social work practice in health-care settings; structure and financing of health-care delivery; administration and leadership; resizing and restructuring strategies; case management; women's health.

Campos, Angel P., *Executive Associate Dean.* Ed.D., Columbia University: Hispanics/Latinos in the United States; the Hispanic/Latino family; mental health and the Hispanic/Latino; cross-cultural social work practice; cultural competency in social work practice; social gerontology; social work education.

Lewis, Michael A., Ph.D., City University of New York Graduate Center: Poverty and social policy; the application of sociology; economics; moral philosophy to the examination of social policy and social programs.

Monahan, Kathleen, D.S.W., Adelphi University: Siblings and sexual abuse; battered women; domestic violence; disability.

Robbins, Charles, *Associate Dean for Academic Affairs and Director of Social Work, University Hospital.* D.S.W., Yeshiva University: Violence in intimate relationships and as public health problem; health-care policy; social work and health care; the use of complementary medicine.

Vidal, Carlos M., *Associate Dean for External Affairs and Development*. Ph.D., Fordham University: Child welfare policy and research methods; Hispanics; empowerment and advocacy; health-care issues among children of color; violence in schools and communities of color.

Clinical Associate Professor

Farrington, Jack, Ph.D., Nova Southeastern University: Community health orientation; advocacy; human rights for Long Island teenagers; domestic violence.

Clinical Assistant Professors

Bacon, Jean, Ph.D., University of South Carolina: Death and dying; ethnic sensitive practice; AIDS; child welfare; qualitative methods; mental health; student-community development; women's studies.

Finch, Jean Bertrand, *Assistant Dean for Field Instruction*. D.S.W., Columbia University: Child welfare; social work practice; drug involved women and their children; clinical practice with children in foster care; qualitative research; quality assurance within non-profit organizations.

Francis, Linda E., *Director of the MSW Program*. Ph.D., University of Indiana: Mental health; health services research; qualitative methods; stress and emotion.

Leung, Rose, Psy.D., Biola University: Community psychology; community mental health; psychosocial models of intervention; Asian-American communities' needs and assessments; racial/cultural sensitivity training and education.

Morgan, Richard, Ph.D., Fordham University: Child welfare policy and programs; child sexual abuse and juvenile sex offenders; research.

Murphy, Bertha, M.S.W., Stony Brook University: Substance abuse and ethnically sensitive practice.

Peabody, Carolyn, Ph.D., Stony Brook University: Advocacy/empowerment theory and practice; feminist theory and practice; mental health; lesbian and gay issues; development of political issues among oppressed populations; impact of sexual abuse histories among mental health populations.

Wrase, Betty-Jean, M.S.W., Stony Brook University: Program evaluation; social welfare administration; case management and health.

Lecturer

Adams, Gloria, *Coordinator, Faith-Based Community Partnerships*. D. Min., Hartford Seminary: Spirituality and religion in social work.

Colon, John, M.A., Inter-American University of Puerto Rico: Substance abuse; methodone treatment; inner-city community-based organizations; grant reviewer for SAMSHA.

Courses

HWC 500 Field Instruction I

Placement in practice settings under supervision of an MSW. Must be taken concurrently with HWC 513.

Prerequisite: Admission to graduate Health Sciences Center program

4-6 credits, S/F graded

HWC 501 Field Instruction II

A continuation of HWC 500. Must be taken concurrently with HWC 514.

Prerequisites: HWC 500 and 513; admission to graduate Health Sciences Center program

4-6 credits, S/F graded

HWC 502 Field Instruction III

Placement in advanced social work practice settings. Supervision provided by a qualified MSW. Must be taken concurrently with HWC 515 and 516.

Prerequisites: HWC 500, 501, 513, and 514; admission to graduate Health Sciences Center program

4-6 credits, S/F graded

HWC 503 Field Instruction IV

A continuation of HWC 502. Must be taken concurrently with HWC 517 and 518.

Prerequisites: HWC 502, 515, and 516; admission to graduate Health Sciences Center program

4-6 credits, S/F graded

HWC 504 Human Behavior and the Social Environment I

Introduces a framework for understanding how individuals and families grow, develop and change within their social environment. Critiques interpersonal, intrapersonal and sociostructural theories and their impact on special populations which have been exploited and alienated in society.

Prerequisite: Admission to graduate Health Sciences Center program

3 credits, ABCF grading

HWC 505 Human Behavior and the Social Environment II

A continuation of HWC 504. Emphasizes an understanding of the life course, the role of time, social events, trauma and the developmental process. Examines the social institutions and their impact on people generally oppressed in society and the role of empowerment.

Prerequisite: HWC 504; admission to graduate Health Sciences Center program

3 credits, ABCF grading

HWC 506 Social Work in Health

Introduces health as an organizing theme for social work knowledge and practice. Surveys the history of social work in health care settings, public health concepts and public problems, and social stratification of health and illness. Critically examines the structure of the health care system, reimbursements, interdisciplinary relationships, and models for social work practice in health care delivery in the 21st century.

Prerequisite: Admission to graduate Health Sciences Center program

3 credits, ABCF grading

HWC 507 Master's Project

Students complete a Master's Project under the sponsorship of a faculty member.

Prerequisite: Admission to graduate Health Sciences Center program

3 credits, ABCF grading

HWC 508 Continuation of Master's Project

A continuation of HWC 507 for students who did not finish their Master's Project during the term in which they had registered for it.

Prerequisites: HWC 507; admission to graduate Health Sciences Center program

S/F graded

HWC 509 Parameters of Social and Health Policy I

Introduces students to U.S. social policy, with a special emphasis on political, economic, and social factors that have affected its historical development, particularly in reference to oppressed groups. Explores relationship of social policy to social work practice.

Prerequisite: Admission to graduate Health Sciences Center program

3 credits, ABCF grading

HWC 510 Parameters of Social and Health Policy II

Utilizes frameworks for social policy analysis. Explores continuing dilemmas in policy development. Stresses effects of social movements and social change on social policy.

Prerequisite: HWC 509; admission to graduate Health Sciences Center program

3 credits, ABCF grading

HWC 511 Research I

Examines the basic concepts and methods of data collection (e.g., surveys, experimental designs, field research, unobtrusive designs) used in social research. Primarily prepares the student to understand and develop a research proposal and to critique methods used in research articles that address critical issues in social work practice.

Prerequisite: Admission to graduate Health Sciences Center program

3 credits, ABCF grading

HWC 512 Research II

Provides instruction in the computation, interpretation, and application of data analytic procedures used in social research. Covers procedures such as descriptive statistics, correlations, chi-square and t-test. Examines their relevancy for analyzing issues in social work practice.

Prerequisite: HWC 511; admission to graduate Health Sciences Center program

3 credits, ABCF grading

HWC 513 Social Work Practice I

Provides the foundation for generalist practice, including the knowledge base, values and skill development necessary for effective practice with individuals, families, groups and communities. Challenges students to work politically, innovatively and with self-awareness in the service of alleviating human pain and enhancing people's abilities and strengths within a framework of social justice. Must be taken concurrently with HWC 500. HWC 504 must have been completed or taken concurrently.

Prerequisite: Admission to graduate Health Sciences Center program

3 credits, ABCF grading

HWC 514 Social Work Practice II

A continuation of HWC 513. Emphasizes work with small groups, community and provider systems. Deepens knowledge of generalist practice and skill development. Must be taken concurrently with HWC 501. HWC 505 must have been completed or taken concurrently.

Prerequisites: HWC 500, 504, and 513; admission to graduate Health Sciences Center program
3 credits, ABCF grading

HWC 515 Advanced Social Work Micro Practice I

Focuses on the helping process with integration of increased understanding of the significance of transactions between people and their environments. Emphasizes development of advanced theory and practice skills. Must be taken concurrently with HWC 502 Field Instruction III and HWC 516 Advanced Social Work Macro Practice I.

Prerequisites: HWC 500, 501, 513, and 514; admission to graduate Health Sciences Center program
3 credits, ABCF grading

HWC 516 Advanced Social Work Macro Practice I

Emphasizes the development of advanced theory and practice in strategic planning, management, evaluation, policy analysis and development, and program development as applied in the health and social welfare fields. Must be taken concurrently with HWC 502 Field Instruction II and HWC 515 Advanced Social Work Micro Practice I.

Prerequisites: HWC 500, 501, 513, and 514; admission to graduate Health Sciences Center program
3 credits, ABCF grading

HWC 517 Advanced Social Work Micro Practice II

Emphasizes professional responsibilities for ongoing self-assessment. Examines agency effectiveness in meeting client needs and providing services. Focuses on further skill development in helping individuals, families and groups and on strategies for achieving necessary changes in agency policy and service delivery systems to meet client needs. Must be taken concurrently with HWC 503 Field Instruction III and HWC 518 Advanced Social Work Macro Practice II.

Prerequisites: HWC 502, 515, and 516; admission to graduate Health Sciences Center program
3 credits, ABCF grading

HWC 518 Advanced Social Work Macro Practice II

Emphasizes advanced theory and practice skills in program planning and management decisions based on the use of consumer oriented methodologies. Focuses on professional responsibility for continuing self-assessment and evaluation. Must be taken concurrently with HWC 503 Field Instruction IV and HWC 517 Advanced Social Work Micro Practice II.

Prerequisites: HWC 502, 515, and 516;

admission to graduate Health Sciences Center program

3 credits, ABCF grading

HWC 519 Aging and the Law

Provides an overview of the many laws and programs affecting the quality of life, concerns, and needs of the aged, with particular emphasis on health care policy. The major entitlement programs for the aged, including Social Security, SSI, Medicare and Medicaid are covered as well as institutions and programs serving the aged including nursing homes, protective services and home care. Health care decision making, including health care proxies, the "right to die" and other ethical and legal issues are emphasized.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 520 Advanced Social Work Practice with the Aged

Examines concepts and strategies for working with the elderly at the primary, secondary, and tertiary levels of intervention. Presents and critically analyzes a variety of approaches in working with the elderly and their families. Examines interventions with the well elderly living in the community, the elderly who suffer some disabilities but who are still living in the community and the elderly who are institutionalized.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 521 Ethnic Sensitive Social Work Practice

Provides a theoretical framework and focuses on the development of the skills necessary to provide effective culturally sensitive social work services to diverse individuals, families, groups and communities. The special problems faced by groups traditionally devalued and oppressed are examined. Emphasizes skills in working for institutional change and social justice. Co-scheduled with HWC 321.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 522 Human Sexuality

Identifies personal attitudes and judgments about sexually related behaviors. Critically examines factual information derived from research in human sexuality and covers a wide range of sexual behavior from a knowledge base.

2 credits, ABCF grading

HWC 523 Growing Old in America: The Social Conditions-Policy and Practice Implications

Explores the social, political and economic conditions related to aging including long-term care in this society. Identifies social policies and program formats that enhance wellness and support dependencies from a positive perspective. Co-scheduled with HWC 323.

2-3 credits, ABCF grading

HWC 524 Children and Adolescents Who Grieve

Focuses on issues related to bereavement in children and young people. Children and adolescents who struggle with the crisis of loss is a special population that is often overlooked. Students explore the emotional response of young people who grieve. Mental health professionals that provide treatment to this population must acquire specialized knowledge and skills to assist in healing wounded children. Upon completion students will have an increased understanding of the developmental implications of loss in childhood, assessment of bereavement, and treatment interventions specific to bereaved children and adolescents. Co-scheduled with HWC 324.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 525 Anger Management

Presents concepts of anger management within a bio-psychosocial context. Students learn how to recognize external manifestations of anger in themselves, clients, organizations and communities. Focus is on assessment of clients' ability to both recognize anger ("residual" as well as anger "masking underlying feelings") and methods used for coping. Anger management concepts and skills at the micro, mezzo and macro levels of practice are explored, including anger management strategies that can be taught to clients as part of an intervention plan. Environmental and societal factors as "igniting events" of anger in individuals, families, groups and communities are examined. Appropriate assessment and interventions at all levels of practice are delineated. Co-scheduled with HWC 325.

2 credits, ABCF grading

HWC 526 Health Care Delivery with Diverse Populations

An overview of the many facets of health care delivery. Various systems and diverse populations and how they are treated by the health care systems are examined. Covered are community-based health care services, hospital care, long-term care and the health care needs and impact of the health care system on women, African Americans, Latinos, the developmentally disabled, children and the aged. Co-scheduled with HWC 326.

Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 527 Social and Behavioral Aspects of Public Health Practice

The psychosocial determinants of behavioral risk factors that affect health across the life span are examined within the conceptual framework for planning health promotion/disease prevention programs. Social, economic, environmental and cultural variations in health, disease and quality of life are addressed, including the influence of race, ethnicity, gender, sexual orientation and biological and genetic factors. Barriers to access and utilization, strategies for health behavior change and methods of developing health promotion/disease prevention programs are examined.

2-3 credits, ABCF grading

HWC 528 Management and Technology in Health Care

Examines the new management styles and methodologies currently utilized in the health care delivery systems. Complements the knowledge gained in HWC 582. Students will develop an understanding of the new technologies that are critical in today's health care delivery systems and their appropriate applications.

*Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading*

HWC 529 Complementary and Alternative Medicine

Human service workers are often required to discuss issues of health and healing. Many individuals, by virtue of their culture, experiences and/or choice, often adhere to a combination of nontraditional and traditional beliefs regarding health care. Familiarizes students with those methods and beliefs most often found in specific cultures. Students will develop an appreciation of each practice in order to interact with clients from a strengths perspective and will gain an international perspective on health care modalities. Co-scheduled with HWC 329.

2-3 credits, ABCF grading

HWC 530 Case Management in Human Services

Case management has grown dramatically in the human service field over the last twenty years in response to the growing service needs of the individuals and families facing complex life situations and issues. Examines both the macro level and micro level issues facing case managers and agencies as they provide quality services to often-oppressed populations. Co-scheduled with HWC 330.

*Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading*

HWC 531 Advanced Market Research

Includes advanced theory and applications of market research to health, mental health, and human service issues. Includes a research practicum focused on testing the feasibility of new methods of service delivery.

*Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading*

HWC 533 Family Intervention in Health and Mental Health

Focuses on family and marital problems. Examines the environmental, social, economic, psychological and institutional pressures that affect family functioning. Emphasizes intervention skills.

*Prerequisites: HWC 501, 514, or permission of instructor; admission to graduate Health Sciences Center program
2 credits, ABCF grading*

HWC 538 Death and Dying; Loss and Separation

Explores student values, attitudes, fears and conceptions relating to death and dying. Examines issues of loss and separation in relation to various age groups, cultural orientations and societal expectations. Focuses on the

acquisition of bereavement counseling skills.

*Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading*

HWC 539 Ancestral Medicine

There is an increasing integration of complementary medicine and allopathic medicine. As health professionals, it is important to understand the beliefs and practices of our clients in order to maximize their options and choices. Professionals must be knowledgeable about the healing traditions anchored in different cultures and ethnicity. This course provides two days of classes on campus and three full days at a homeopathic clinic in Aruba or the United States. Students will have the opportunity to learn from presentations given by doctors at the clinic as well as by observing their work. Co-scheduled with HWC 339.

*Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading*

HWC 540 Social Issues in Popular Culture

Movies have been a useful medium that can illustrate current social issues and family dynamics as well as policy and research dilemmas. Each week a film with a central practice/research/policy issue provides the basis for a lecture and class discussion. Topics focus on a variety of social issues such as family dynamics, bereavement, adoption, domestic violence, abuse, residential placement, policy and research. Co-scheduled with HWC 340.

2 credits, ABCF grading

HWC 541 Youth and Violence

Examines the etiology of youth at risk for violence, using ecological and interpersonal perspectives. Family, school and community risk factors are outlined as well as assessment, intervention and treatment issues. Successful prevention programs are highlighted.

*Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading*

HWC 542 Children of Chaos: The Social Worker's Role

Designed to provide an understanding of the special issues and concerns surrounding work with children. Professional dilemmas and guidelines to aid practice are identified. Special issues involved in work with young children are highlighted. Although the focus is on direct work with children, a family-centered approach is presented. Practitioner roles, the impact of service settings, policy and legislation affecting this area of practice are reviewed as is the knowledge base that serves to guide practice, including formulations of practice theory and empirical research findings. Co-scheduled with HWC 342.

*Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading*

HWC 543 Ethics in Health Care Practice

Students will learn basic ethical principles and concepts. Utilizing a problem based learning model, students will have the opportunity to examine many of the critical ethical issues that are impacting professional prac-

tice today. Students will use a professional Code of Ethics and examine their implications for practice.

*Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading*

HWC 544 Overview of Substance Abuse

An examination of the history and development of alcohol and substance abuse problems in the United States. Focuses on the etiology, psychopharmacology and legal ramifications of the use of licit and illicit substances in our culture. Provides information on a variety of services available to drug abusers, addicted individuals and their families in the fields of prevention, education and treatment.

2 credits, ABCF grading

HWC 545 Individual, Group and Family Treatment of Alcoholics and Substance Abusers

Covers alcoholism and substance abuse as family illnesses and their stages of development, as well as the impact these illnesses have on the families of active and recovering alcoholics and substance abusers. Focuses on self-help groups and on traditional and relatively recent modalities used in the treatment of addicted individuals and their families.

*Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading*

HWC 546 Working with Adult Children of Alcoholics and Substance Abusers

Focuses on adult children of alcoholic parents and how parents' illness affects their children's social, emotional, and educational development from infancy to adulthood and into old age. Discusses survival roles of children in alcoholic families and how these affect adult functioning. Examines the continuing effect family alcoholism has on adult children and the intervention strategies used in treatment.

*Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading*

HWC 547 Managing Conflict

A major concern for health and human service managers is conflict in organization, community and group settings. The various types of conflicts and the concepts of negotiation and mediation as interventive strategies will be considered. Didactic and experiential learning experiences are utilized. Focus is on analyzing conflict situations and selecting interventive strategies to reduce, contain or heighten the conflict situation. Oppressive conditions, structures and processes are considered major determinants of human suffering and individual and social problems; students examine how these oppressive conditions are present in conflict situations and consider ways of dealing with them. Co-scheduled with HWC 347.

2-3 credits, ABCF grading

HWC 548 Adolescent Development and Health Promotion

Examines the effect on adolescent development of physiological changes, relationships with peers and family, and societal expectations. Emphasis is on the development of

assessment and engagement skills for working with adolescents and their families to help counteract adolescent self-destructive behavior and promote well-being.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 549 Overview of Social Work with Special Populations

Examines the issues that social workers must consider when working with traditionally disenfranchised populations. Emphasis will include micro and macro issues when intervening with gay and lesbian individuals, members of diverse racial and ethnic groups, and women, as well as others. The historic as well as contemporary experiences of these individuals' interactions with the health and human service delivery system will be explored. Co-scheduled with HWC 349.
2 credits, ABCF grading

HWC 550 Culture Centered Social Work Practice

Provides students with an opportunity for self growth while preparing to work with individuals and their families from a culture centered value base. The culture centered foundation practice will provide students with a frame of reference for better understanding and appreciation of the difference of their own culture from the cultures of others.
Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 551 Law and Social Change

Introduces students to the interrelationship of the legal process in the United States and the profession of social work. Focuses on the legal process in general, social welfare law, in particular, and the implications for effective social work practice. Co-scheduled with HWC 351.
2 credits, ABCF grading

HWC 552 Lesbians and Gay Men: Issues in Health Care

An examination of the critical impact that health care policies and services have on lesbians and gay men in American society. Issues related to access to care, discrimination, services, health insurance, health care resources within geographical areas, and the health status of lesbians and gay men are examined. Focuses on the issues that lesbians and gay men encounter in their interactions with the health care system.

Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 553 Chemical Dependency in Special Populations

Covers alcoholism and substance abuse with populations that have been traditionally devalued and oppressed. Focuses on development of skills and sensitivity to the needs of ethnic groups, women, the elderly, the mentally ill and gay and lesbian people who are chemically dependent. Explores policy and practice issues related to these populations.
2-3 credits, ABCF grading

HWC 554 Working with African Americans and Hispanics

Teaches students to empower, counsel and work with African Americans and Hispanics in the context of their racial, cultural, social, economic, and political reality. Emphasizes students' need to make a conscious inventory of their own backgrounds, including their race, culture and geographic area of rearing and residence, as factors that contribute to their attitudes, behaviors and biases. Covers knowledge and skill areas that enhance students' abilities to work effectively with African American and Hispanic individuals, families, groups and communities.

Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 555 Supervision in Health and Human Service Organizations

Prepares social workers for the variety of tasks related to supervisory practice in health care agencies. Supervision is introduced as a teaching process, as an administrative function and as a program development tool. Emphasis is on helping workers function effectively with culturally diverse clients, populations at risk and the chronically ill. Content includes the historical perspective of supervisory practice; supervisor and agency structure; the organizational context of practice; learning theories; concepts of power, authority, and accountability; ethical and clinical issues; supervisory techniques, skill and self awareness; staff and program development and evaluation.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 556 Proposal Writing in the Health and Human Service Fields

Provides a comprehensive study of the principles and methods used to prepare program, training, research, demonstration and other types of proposals. Includes extensive workshop practice in developing appropriate writing skills and in locating and accessing funding sources. Co-scheduled with HWC 356.
2-3 credits, ABCF grading

HWC 557 Cultural Competency: An Ingredient in Enhancing Treatment Outcomes

Demonstrates that cultural competency, like computer literacy, is a necessity. Outlines how prevention messages and treatment modalities provided within a cultural context are likely to change attitudes or redirect behaviors. There is a new wave of immigrants and a growing assertion of cultural identity by groups who were born in the United States. Therefore, a new communication edict of cultural dialogue is fast becoming part of one's professional mandate. Hence, the ability to interact with people who are culturally different from the professional is a prerequisite to providing culturally competent services to these groups. Co-scheduled with HWC 357.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 558 Human Service Administration

An introduction to the practice of administra-

tion of public and non-profit agencies, theories of management including alternative decision-making models, understanding of organizational structure and process, external and internal functions including interagency collaboration and personnel and financial management, affirmative action and ethical issues. Combines theory with case examples, practical exercises and other experiential learning modes.

Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 559 Mental Health Evidence-Based Practice for Social Workers

Develops the knowledge and skills necessary for working with individuals with a diagnosis of serious mental illness using recovery-oriented evidence-based practices. Designed for MSW students and MSW mental health practitioners. Familiarizes students with evidence-based practices, within a recovery-oriented paradigm, as a general approach to practice as well as specific evidence-based interventions to use for individuals with a diagnosis of serious mental illness. Students should have a basic knowledge of serious mental illness as pre- or co-requisite, however a review will be provided. Will examine research literature to determine the various levels of support for specific interventions and essential principles for translating research into practice. Identifies the appropriate treatment outcomes that reflect effective quality mental health practice. Focus is on providing assessment and treatment to a diverse group of individuals with a diagnosis of serious mental and will be discussed in detail.

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HWC 561 Implications of Racism for Social Welfare

Examines personal and institutional racism in the United States and the effect racism has on the delivery of services to individuals who do not fit the traditional "American model." Examines the historical relationship between racism and social welfare policies, programs and practice, and contemporary strategies for change. Co-scheduled with HWC 361.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 563 Homelessness, Politics, and Public Health

Analyzes homelessness as an issue of social policy, including its history, recent causes, and current demographics. Emphasizes the political and economic context that has made homelessness a major social problem. Co-scheduled with HWC 363.
2-3 credits, ABCF grading

HWC 566 Student-Community Development Student Portfolio Project

Provides an opportunity for students to create a portfolio composed of various components that integrates the student's educational experiences and achievements in the Student-Community Development Specialization. Components may include literature reviews, abstracting research articles, analysis of field

placements, review of President's Symposium, etc.

Prerequisite: Admission to graduate Health Sciences Center program
1-3 credits, ABCF grading

HWC 567 Psychopathology and Psychopharmacology

An overview of the DSM IV(TM) system of Classification of Mental Disorders. Emphasizes the social work component within the interdisciplinary team. Special emphasis on assessment. Introduces psychopharmacology and the social work role related to drug management including side effects, risks and changes over time. Critiques value systems involved in diagnosis and definition of disorders.

Prerequisites: HWC 504-505 or permission of instructor; admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 568 The Workings of the Brain: Practice Issues for Social Workers

Addresses the organization, development, and functions of the brain and how this influences how we think, feel and behave. Causes of organic changes in the brain such as substance abuse, disease and injury are addressed. Advances in neuroscience that have aided in diagnosis and social work practice are covered. Innovative treatment modalities such as EMDR, biofeedback and vagal nerve implants are presented. Strongly emphasizes the combination of science and practice issues.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 569 Childhood Sexual Abuse and Long-Term Sequelae: Assessment and Intervention

Introduces students to the incidence and prevalence of childhood sexual abuse as a national problem. Covered are definition issues, sequelae during childhood, family constellation and adult sequelae. Addressed are assessment and current treatment modalities, particularly for families and offenders, ethical and legal dilemmas and the subsequent health related difficulties of this childhood trauma. Special attention is paid to the cultural dynamics in sexual abuse. Students are expected to develop an awareness of and critically analyze current research. Focus is also on examination of policy issues and legislation.

Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 570 Computer Technology for Research and Administration in Health and Human Service Organizations

Introduces students to the application of information technology for health and human service programs and research. Serves as an introduction to the nature, function and use of the computer in the human services. Emphasis is placed upon computer applications relating to client case management systems, report writing, fundraising, and research. Students acquire elementary skills in report generation, information management, and in the use

of the internet. Students are introduced to the world wide web and how it can be used in practice, administration and research. Extensive hands-on experience is provided.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 575 Child Welfare: An Overview

Covers the impact of historical and contemporary developments within the field of child welfare. Examines the evaluation of child welfare services and the role of child care workers. Examines out-of-home care, foster care, group home care and institutional care within the context of traditional public/voluntary structure of services and the social/political context. Covers services in relation to the changing roles of the family, emergence of child care.

Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 577 Program Evaluation

Provides an in-depth analysis of the technical requirements of program evaluation and the organizational and political constraints that influence the evaluation process. Covers techniques in the design and implementation of evaluation research in the health and human service fields.

Prerequisites: HWC 511 and 512
2-3 credits, ABCF grading

HWC 579 Special Topics in Social Work

Examines significant timely issues confronting the profession. Topics include violence as a public health problem, issues of aging, racism, gender, AIDS, the media, spirituality, forensic social work, international social work, and others. Topics vary each term as faculty develop specific modules that address one or more of these issues. Co-scheduled with HWC 379.

1-3 credits, ABCF grading
May be repeated 4 times for credit

HWC 580 Seminar on Family Violence

An overview of the phenomenon of family violence in the United States including child abuse, partner abuse and elder abuse. Explores theories of etiology, including patriarchy, intergenerational family dynamics and substance abuse. Examines programmatic approaches including the legal system and programs for batterers by utilizing guest speakers from Suffolk County agencies.

2 credits, ABCF grading

HWC 581 Public Health and Community Health Intervention

Examines many of the critical public health issues of today. Students gain an understanding of the concepts underlying social epidemiology and develop an appreciation of the ways in which the health status of different populations in this country is differentially impacted. Examines community health planning strategies (e.g., health promotion and health education).

2-3 credits, ABCF grading

HWC 582 Organizational Dynamics and Legal and Ethical Issues in Health Care

Examines some of the traditional, as well as newer, models through which health care

services are delivered. Particular emphasis will be given to the issue of access to health services as well as the location of the professional social worker within these systems. Students will gain the ability to conceptualize many of the critical ethical and legal issues impacting the field today.

2-3 credits, ABCF grading

HWC 583 Theories of Social Work

An examination of some basic epistemological issues followed by a consideration of conceptual frameworks potentially useful in studying social work practice. Focus is on recent intellectual contributions to the social work literature, which enlighten professional practice, purpose and function, and some historical developments. Students utilize a critical analytic perspective to assess the state of the art in social work practice theory. Special emphasis is directed to the program areas of social health, mental health and substance abuse and formulations related to social change. Issues and priorities for research are considered.

Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 584 Community Analysis and Health Promotion

Explores diverse concepts of community, analyzes a range of community structures, processes, and power relationships. Investigates contemporary models, strategies and tactics of community organizing and health promotion in the United States and in selected other countries. Emphasizes efforts by poor people, ethnic minorities of color and women to organize and mobilize community groups and movements. Highlights group and community analysis and organization skills.

2-3 credits, ABCF grading

HWC 585 Health and Social Planning

Provides a generic understanding of the planning process and exposure to the planning processes used in the organization and delivery of health services. Explores the various backgrounds, lifestyles, and coping mechanisms of patients, with particular attention given to class, race, age, and sex and how the planning process includes or excludes these factors.

Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 586 Managed Care and Health Care Delivery

Managed care is currently the main method being used for controlling costs and delivering medical care to clients. Much of what social workers do in the future will take place within the context of managed care. Covers the history of managed care in the United States, the promises and pitfalls of managed care relative to other payment strategies and how managed care affects the delivery of services to people. Particular attention is paid to barriers to care and how managed care affects people from disadvantaged backgrounds (e.g., the homeless and mentally ill).

Prerequisite: Admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 587 Empowering the Disenfranchised

Designed as a practicum that aims to enhance the student's ability to promote and work with grass-roots community leaders as they mobilize themselves toward being a positive force in the arena of state politics on behalf of those in need.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 588 Qualitative Health Research Methods

The class works as a team on a joint project. Topics include problem formulation, instrument construction, sampling strategy, interviewing, data transcription, and data analysis.

Prerequisites: HWC 511 and 512; admission to graduate Health Sciences Center program
2-3 credits, ABCF grading

HWC 589 Biostatistics

An introduction to the analysis and interpretation of quantitative data using biostatistical methods. Examines three interrelated issues: the nature of quantitative data and their relationship to social, psychological, and biological concepts, the different ways data can be presented to help others understand research questions and the answers to those questions and the basic and intermediate biostatistical techniques available to analyzing data. Focuses on how data relate to research questions that are of interest to workers in the health care field.

Prerequisites: HWC 512 or equivalent; admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 590 HIV/AIDS

Focuses on central aspects of the HIV/AIDS pandemic, including the current state of medical knowledge, HIV/AIDS and the law, prejudice and discrimination, AIDS activism and organizing, grief/death/dying, psychosocial issues, redefining the medical model, homophobia, racism, sexism and ableism in research, treatment and policy, IV drug use, drug treatment and other related issues. Upon completion of this course, students will have met the educational requirements established by the HIV Primary Care Medicaid Provider Agreement. This requirement is needed to conduct HIV pre- and post-test counseling in hospitals and clinic settings. Co-scheduled with HWC 390.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 591 Student-Community Development Independent Reading/Colloquia I

Introduces the Student-Community Development Model as an integrated application of social work, community organizations, and student development theories and practice modalities. Examines the history of higher education as related to the evolution of the American college campus and changes in student culture and needs.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 592 Student-Community Development Independent Reading/Colloquia II

A continuation of HWC 591.

Prerequisites: HWC 591; admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 593 Student-Community Development Seminar I

Examines how political, socio-economic, cultural and health issues impact higher education. Emphasizes how these systems influence and shape student community wellness on the college campus. Critically examines contemporary higher education organizational structures, planning modalities and intervention strategies.

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HWC 594 Student-Community Development Seminar II

A continuation of HWC 593. Explores and develops intervention strategies, organizational structures and planning parameters utilizing campus-based case studies. Examines the role and placement of change agents within the campus life-arena.

Prerequisites: HWC 593; admission to graduate Health Sciences Center program
3 credits, ABCF grading

HWC 595 Independent Study

Independent study with an individual faculty member.

Prerequisite: Admission to graduate Health Sciences Center program
1-3 credits, ABCF grading
May be repeated three times for credit

HWC 596 Marketing for Health and Human Service Organizations

Presents theory, principles, and methods of marketing as applied to non-profit and governmental health and human service organizations. Focuses on the planning and implementation of marketing projects aimed at developing programs and attracting clientele, funds and public support. Requires students to analyze and develop a marketing plan for a specific organization.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 597 Case Management

Open only to students who have completed the Case Management Certificate Program and have completed 15 additional hours of assignments.

Prerequisite: Admission to graduate Health Sciences Center program
4-6 credits, S/F graded

HWC 598 Issues in Higher Education

Examines current issues which arise in institutions of higher education, utilizing alternative conflict resolution and mediation to provide the framework to examine a variety of social issues on college campuses. Explores such issues as diversity, violence, substance abuse, and mental health.

2 credits, ABCF grading

HWC 599 Maintenance of Matriculation

For students who are maintaining matriculation while engaging in consultation with faculty regarding completion of courses and/or the Master's Project.

Prerequisite: Admission to graduate Health Sciences Center program
1 credit, S/F graded
May be repeated six times for credit

HWC 600 Statistics I

Provides instruction in the computation, interpretation, and application of data analytic procedures used in social research. Discusses procedures such as descriptive statistics, chi-square, and t-tests, while examining their relevancy for analyzing issues in social work practice.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, 3 credits, ABCF grading

HWC 601 Statistics II

Introduces students to multivariate techniques used in the analysis of various kinds of data. Analysis of Variance, Multiple Regression Analysis, Logistic Regression Analysis, and Log-Linear Regression Analysis, as well as more advanced techniques, such as path analysis and survival analysis, are discussed.

Prerequisites: HWC 600 Statistics I or a comparable course and successful completion of a waiver examination; admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HWC 602 Research Methods I

Presents an overview of the variety of research methodologies utilized in social science and social work, with the goal of providing students with the knowledge and competencies needed to develop and conduct their own research. The course will lead to a sophisticated understanding of the research process including the formulation of research questions, hypothesis development and testing, and choice of research method, involving both quantitative and qualitative methods. Material on quantitative designs will include experimental and quasi-experimental designs, data collection methodologies, scaling, instrument development, and sampling procedures. Material on qualitative designs will address focus groups interviews, key informant interviews, participant observation, unobtrusive observation, text and content analysis, and the use of archival and historical data. Special attention is given to ethical and political issues in the conduct of research.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, 3 credits, ABCF grading

HWC 603 Research Methods II

A continuation of HWC 602.

Prerequisite: Admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HWC 604 Naturalistic and Qualitative Research

Considered is the application of alternative research methods for different questions. The distinction between quantitative and

qualitative approaches and methods in the analysis of qualitative data is explored.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, 3 credits, ABCF grading

HWC 606 Research Practicum I

Students undertake significant and methodologically rigorous research involving design, implementation, analysis, and dissemination of a research project. The substantive areas will include health, mental health, or substance abuse. School of Social Welfare faculty, affiliated faculty members from the Health Sciences Center and University social science departments, and principal investigators in community research projects will serve as preceptors. Students will spend ten hours each week for two semesters in a practicum setting. Students have a supervised hands-on, practical experience with an ongoing research project. Typical activities include data analysis, interpretation of results, research report writing, subject recruitment and screening, instrument development, or data collection. The primary objective is to strengthen students' ability to synthesize various phases and components of social research. A focus is on articulating linkages among the research questions, the data gathered to address these questions, the techniques selected for manipulating and analyzing the data, and the interpretation of findings. Students are encouraged to pursue publication stemming from the practicum. While the research practicum may not necessarily expose students to the specific population or problem of greatest interest to them, the skills or competencies mastered can prepare students methodologically to carry out their dissertation research plans.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, 3 credits, S/U grading

HWC 607 Research Practicum II

A continuation of HWC 606.

Prerequisite: Admission to graduate Health Sciences Center program
Spring, 3 credits, S/U grading

HWC 608 Social Welfare Policy Analysis I

An analytical approach to public policy formulation in the areas of health, mental health, and substance abuse involving the impact of environmental forces on policy content. Considered are the effects of various institutional arrangements and political processes as well as inquiry into the consequences of various contemporary public policies. Tools and frameworks of policy analysis are examined. Policy alternatives and policy development and implementation are also considered.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, 3 credits, ABCF grading

HWC 609 Social Welfare Policy Analysis II

A continuation of HWC 608.

Prerequisite: HWC 608; admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HWC 610 Organizational Theory and Social Welfare Administration

The focus is on theories and methods available to planners and administrators who function in complex organizational settings. Decision making, political and economic factors, information systems, value conflicts, and adaptations of rational models to emerging realities will be studied. Health and mental health programs will be utilized as exemplars.

Prerequisite: Admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HWC 611 Knowledge Building in Social Work: The Philosophy of Applied Social Research

An examination of the major currents of thought that shape the meta-theoretical, theoretical, and methodological issues related to knowledge building in social work. The impact of pragmatic philosophy on the current "science versus non-science" debate within social work is reviewed. Special attention is given to epistemological approaches and their relation to qualitative and quantitative research strategies.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, 3 credits, ABCF grading

HWC 612 Theories of Social Work

An examination of some basic epistemological issues followed by a consideration of conceptual frameworks potentially useful in studying social work practice. Attention will be focused on recent intellectual contributions to social work literature that enlighten professional practice, purpose, and function, as well as historical developments. Students will utilize a critical analytic perspective to assess the state of the art in social work practice theory. Special emphasis will be directed to the program areas of health, mental health and substance abuse, and formulations related to social change. Issues and priorities for research will be considered.

Prerequisite: Admission to graduate Health Sciences Center Program
Fall, 3 credits, ABCF grading

HWC 613 Seminar in Social Work Education

Focus is on the place of social work education in the university with attention to issues of current concern such as the integration of professional education with the scholarly research focus of other academic disciplines. Consideration will be given to educational program structure, content, curriculum development, evaluation, and teaching methodologies. Students will be required to teach a course in the B.S.W. or M.S.W. curriculum under mentorship of a senior faculty member.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, 3 credits, ABCF grading

HWC 614 Teaching Practicum

The teaching practicum is a supervised experience in teaching at the master's or undergraduate level in the School of Social Welfare, or in some aspect of academic administration, such as curriculum development, project planning, and/or proposal development. The educational practicum is typically available to doctoral students in the third year. An

individualized plan will be developed for implementing the teaching practicum. Practica may include teaching a section of a required graduate/undergraduate course, working as a teaching assistant with a faculty member, and/or co-teaching and working with the curriculum committees and area sequences in curriculum development.

Prerequisite: Admission to graduate Health Sciences Center program
Spring, 3 credits, S/U grading

HWC 615 Dissertation Seminar I

Students are expected to survey the current state of the art in their area of interest and to develop a written prospectus on a question suitable for dissertation research. In the second semester, students will refine dissertation proposals through presentation and critique in the seminar. Specific techniques and alternatives in studying a variety of dissertation questions are compared.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, 3 credits, ABCF grading

HWC 616 Dissertation Seminar II

A continuation of HWC 615.

Prerequisite: Admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HWC 695 Independent Study

Prerequisite: Admission to graduate Health Sciences Center program

HWC 699 Dissertation Research on Campus

Dissertation research under direction of advisor.

Prerequisites: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab; admission to graduate Health Sciences Center program
Fall, spring, and summer, 1-9 credits, S/U grading

HWC 700 Dissertation Research Off Campus-Domestic

Prerequisite: Advancement to candidacy (G5); major portion of research will take place off-campus, but in the United States and/or U.S. provinces. Please note: Brookhaven National Labs and the Cold Spring Harbor Lab are considered on-campus. All international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor; admission to graduate Health Sciences Center program
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

HWC 701 Dissertation Research Off Campus-International

Prerequisite: Advancement to candidacy (G5); major portion of research will take place outside of the United States and/or U.S. provinces. Domestic students have the

*option of the health plan and may also enroll in MEDEX. International students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed. International students who are not in their home country are charged for the mandatory health insurance. If they are to be covered by another insurance plan they must file a waiver by the second week of classes. The charge will only be removed if other plan is deemed comparable. All international students must receive clearance from an International Advisor; admission to graduate Health Sciences Center Program. Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit*

HWC 800 Full-Time Summer Research

*Prerequisite: Admission to graduate Health Sciences Center program
0 credits, S/U grading
May be repeated for credit*



Sociology (SOC)

Chairperson: Diane Barthel-Bouchier, Ward Melville Social and Behavioral Sciences Building S-409 (631) 632-7755

Graduate Program Director: Ivan Chase, Ward Melville Social and Behavioral Sciences Building S-435 (631) 632-7753

Graduate Program Coordinator: Wanda Vega, Ward Melville Social and Behavioral Sciences Building S-401 (631) 632-7730

Degrees awarded: M.A. in Sociology; Ph.D. in Sociology

The Department of Sociology, in the College of Arts and Sciences, offers a nationally ranked graduate program leading to the Ph.D. degree. It also grants an M.A. degree as a sign of progress toward the doctorate and as a terminal degree in a variety of specialties.

The sociology program grants the doctorate to three to six students per year. Most of these go on to university or college teaching positions or postdoctoral programs at other universities. A few enter government service or business.

Facilities

The Sociology Department has the only laboratory for the study of social systems in humans and animals existent in a sociology department; it is devoted to basic research in social organization. The department also has a Sociology Reading Room. The Ward Melville Social and Behavioral Sciences Building is networked by computers to a divisional network, University mainframes, and the Internet, as well as to the Social Sciences Data Lab's computing facilities and data library.

Admission

Admission to the Ph.D. and M.A. Programs in Sociology

For admission to graduate study in sociology, the following, in addition to the minimum Graduate School requirements, are normally required:

A. A bachelor's degree or its equivalent, as attested to by transcripts of previous academic work;

B. Undergraduate statistics course;

C. Undergraduate grade point average of 3.0 or above;

D. Satisfactory results on the Graduate Record Examination (GRE) General Test (International students, in addition to taking the GRE, must take the TOEFL exam and receive a score of 550 or better to be considered for admission);

E. Satisfactory recommendations from former instructors;

F. Acceptance by both the department and the Graduate School.

Faculty

Distinguished Professor

Gagnon, John H., *Emeritus*.¹ Ph.D., 1969, University of Chicago: AIDS research; simulations; sexual conduct; social control; cognitive.

Distinguished Service Professor

Goodman, Norman, also a *Distinguished Teaching Professor*.² Ph.D., 1963, New York University: Social psychology; family; socialization; emotions.

Distinguished Teaching Professor

Tanur, Judith³, Ph.D., 1972, Stony Brook University: Statistics; methodology; survey research; social psychology.

Professors

Arjomand, Said, Ph.D., 1980, University of Chicago: Comparative; historical; political; religion.

Barthel-Bouchier, Diane, *Chair*.⁴ Ph.D., 1977, Harvard University: Culture; community; historical; gender.

Cole, Stephen⁵, Ph.D., 1967, Columbia University: Science; gender; theory.

Feldman, Kenneth⁶, Ph.D., 1965, University of Michigan: Social psychology; higher education; socialization.

Kimmel, Michael, Ph.D., 1981, University of California, Berkeley: Comparative and historical development; social movements; gender and sexuality.

Roxborough, Ian, Ph.D., 1977, University of Wisconsin, Madison: War and military; historical; revolutions; economic.

Rule, James B., Ph.D., 1969, Harvard University: Theory; political; technology.

Schwartz, Michael⁷, Ph.D., 1971, Harvard University: Methodology; historical; political economy; business structure; social movements.

Tyree, Andrea, Ph.D., 1968, University of Chicago: Demography; social stratification; ethnicity; marital violence.

Associate Professors

Auyero, Javier, Ph.D., 1997, The New School for Social Research: Collective behavior; social movements; political; urban poverty and social inequality; Latin American studies; social and cultural theory.

Chase, Ivan, Ph.D., *Graduate Program Director*. 1972, Harvard University: Social organization; behavioral processes in small groups; resource allocation; collective action; cross-species comparisons.

Collver, O. Andrew, *Emeritus*. Ph.D., 1964, University of California, Berkeley: Human ecology; urban community; demography.

Oyewumi, Oyeronke, Ph.D., 1993, University of California, Berkeley: Gender; race; family; culture; knowledge; social inequalities; globalization.

Assistant Professors

Levy, Daniel, Ph.D., 1999, Columbia University: Global sociology; political; migration and immigration.

Moran, Timothy, Ph.D., 2000, University of Maryland: Comparative; social inequality; economic; political; stratification; quantitative methods.

Otis, Eileen M., Ph.D., 2003, University of California-Berkeley: Global sociology; sex and gender; economy and society.

Shandra, John, Ph.D., 2005, Boston College: Quantitative methods; environmental sociology.

Tsutsui, Kiyoteru, Ph.D., 2002, Stanford University: Political; comparative; historical; collective behavior; social movements.

Research Faculty

Schwartz, Joseph, *Associate Professor*.⁸ Ph.D., 1978, Harvard University: Quantitative methods; social stratification; sociology of work and occupations; social networks.

Number of teaching, graduate, and research assistants, fall 2005: 29

1) *Joint appointment, Department of Psychology*

2) *Recipient of State University Chancellor's Award for Excellence in Teaching, 1976*

3) *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990. Recipient of the President's Award for Excellence in Teaching, 1990*

4) *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1989. Recipient of the President's Award for Excellence in Teaching, 1989*

5) *Recipient of the President's Award for Excellence in Teaching, 1992*

6) *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1995. Recipient of the President's Award for Excellence in Teaching, 1995*

7) *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1975*

8) *Joint appointment, Departments of Psychiatry and Behavioral Sciences*

Degree Requirements Requirements for the Ph.D. Degree in Sociology

In addition to the minimum Graduate School requirements, the following are required:

A. Residence

Minimum residence is one year of full-time study. Students may be admitted to the Ph.D. program on a part-time basis, but these arrangements usually require that the students appear on campus during certain periods of the normal working day. Full-time study entails 12 or more graduate credit hours per semester for those students entering without prior graduate study or fewer than 24 graduate credit hours, and nine or more graduate credit hours per semester for those students entering with more than 24 graduate credit hours or with advanced standing provided by prior graduate work. Since a graduate traineeship is considered part of the academic program, credit hours will be given for teaching or research assistantships as well as supervised teaching. Under specific conditions credit may be given for individual research work outside formal courses but under the supervision of faculty members.

B. Courses

Course requirements for a Ph.D. in sociology include five designated courses, two in sociological theory and three in statistics and methods, all taken in the first year of graduate study. Of an additional nine required courses, one must be taken in introduction to global sociology and another, which must provide additional methodological training, can be chosen by the student from a variety of suitable offerings specified by the department. Three of the remaining eight required courses may be taken outside the department, upon written approval from the department's graduate committee. These three courses must be completed with at least a B average.

During the first year of study full-time students who have fewer than 24 graduate credit hours take eight courses; full-time students who have 24 or more graduate credit hours from prior graduate study take six courses. These must include two two-course sequences, one in sociological theory

(SOC 505 and 506) and one in statistics (SOC 501 and 502), plus a methods course (SOC 504) and one elective course. For those holding graduate traineeships, a teaching assistantship under the supervision of a faculty member would consist of two of the eight courses (one each semester).

C. M.A. Degree

A student is awarded the M.A. degree as a sign of progress toward the Ph.D. To receive the M.A. a student must complete:

1. Two consecutive semesters of full-time study, achieving a 3.0 grade point average for 30 hours of graduate work;
2. One of the three papers required by the writing option (Section D, Option 2) for the Ph.D. program.

D. Professional Competence Options

Continuing doctoral students have two options for completing the first half of the doctoral program before moving on to work in a special field and on their dissertation.

Option 1—Comprehensive Examination and M.A. Research Report:

In this rather traditional option, the adequacy of a student's general preparation is evaluated by means of a written comprehensive examination. This examination, to be taken between the beginning of the fifth semester and the beginning of the sixth semester of graduate study, must be passed at the standard set by the department for doctoral-level work. A student who fails to pass this examination at the required level, but whose performance is satisfactory in all other aspects, may be permitted to take a terminal M.A. by completing 30 credits of graduate coursework and submitting an acceptable research report. Upon passing the comprehensive examination, the student must submit a research report that demonstrates ability to analyze empirical data and to present findings clearly and systematically. Upon successful completion of all of the above requirements, along with completion of a minimum of 30 hours of graduate credit, the department will recommend to the dean of the Graduate School that the student be awarded the M.A. degree as a sign of progress toward the Ph.D. Recipients of the terminal M.A. will not be granted permission to continue.

Option 2—The Two Papers: In this option, a student can meet M.A. requirements and proceed to the second half of doctoral work through the submission of two papers written under faculty supervision. These should normally be completed by the end of the third academic year; each of the two papers is designed to allow students to demonstrate a different competence. Each paper should be more substantial than a seminar paper and less substantial than an M.A. thesis; two different substantive areas must be represented in the papers. The two papers are designed to demonstrate competence in the kinds of skills that students will need in the profession of sociology. One of these papers must be a theoretical/empirical paper and the second can be either a second theoretical/empirical paper, an analytical review of the literature, or an analytical review of the literature embedded in a grant proposal. In other words, one paper must be theoretical/empirical and the second may be chosen from among the three possible kinds of papers described below.

1. **Mandatory Theoretical/Empirical Paper:** The majority of sociological articles use empirical data to answer theoretical questions. Such questions often arise from previous research. They can also be the result of juxtaposing two or more theories, or finding that a theory could use further development or clarification on a point, and then showing how the proposed development or clarification better explains some specific aspect or aspects of social reality.

The empirical data explained or clarified by the theory or theories can take a number of forms. It can be the product of ethnographies, comparative and/or historical research, social surveys, small group or experimental laboratory research, content analyses, etc. The important point is to combine theory and empirical research.

2. **Analytical review of the literature:** This paper is to be an assessment of the state of the art in some substantive area of sociology. This paper can take various forms. One possibility is a review essay and examples of this form can be found in the *Journal of Economic Literature*, *The Psychological Review*, or the *Annual*

Review of Sociology. A second approach could be a review of a field that could serve as the substantive underpinning for a graduate seminar.

3. Analytical review of the literature embedded in a grant proposal: This is to be a major grant proposal. It should normally include a review of the relevant literature, statements of the theoretical framework being used, the hypotheses to be tested, and methodology to be employed in the project. The proposal does not have to be submitted to a funding agency, but all the materials required by a particular agency or foundation must be completed and, in addition, the project must receive CORIHS (Committee on Research Involving Human Subjects) approval, if human subjects are involved. This proposal must also be of substantial size. A very short proposal of just a few pages is not adequate even if that is acceptable to some particular agency.

Upon successful completion of all of the above requirements, along with completion of 30 hours of graduate credit, the student may proceed to the advanced stage of his or her doctoral work.

E. Teaching Requirement

Graduate training includes supervised teaching experience. In the fall semester of their third year, students enroll in a teaching practicum to prepare them to teach their own course, under supervision, the following semester or in the Fall semester of their fourth year.

F. Preliminary Examination

This takes the form of an oral examination in the student's specialty to be given only after all the above requirements have been met. It is designed to appraise the depth of knowledge in the broad area from which the student has selected a dissertation topic. The content of this area is to be defined individually for each student. It consists of a generally recognized, broad subfield and must deal with related materials from other subfields.

G. Advancement to Candidacy

The department's recommendation that a student be advanced to candidacy for the Ph.D. is based on passing the preliminary examination and approval of a dissertation proposal.

H. Doctoral Dissertation

This must be an independent piece of research and scholarship representing an original contribution, the results of which are worthy of publication. Upon oral defense and acceptance of the dissertation, the department will recommend to the dean of the Graduate School that the student be awarded the Ph.D. degree.

The progress of every student will be evaluated by the department at the end of the first full year of graduate study. Those whose performance and ability are clearly below the standard established by the department for the Ph.D. will be asked to withdraw before they have made a costly investment of time. If more than seven years have elapsed since the student completed 24 hours of graduate courses in the department, the student's Ph.D. candidacy will lapse. After the first year, a progressively larger proportion of a student's time will be spent as a participant in research activities, under the supervision of faculty members. Ordinarily, a student with adequate preparation and involved in full-time study should be able to earn a Ph.D. within five to six years from the start of graduate work.

Students who arrive with an M.A. degree in sociology or with three semesters of work in the discipline will be expected to complete some of the requirements above more quickly than indicated.

Courses

Please refer to the Undergraduate and Graduate Class Schedules for specific semester offerings.

SOC 501 Multivariate Statistics for Social Science

This course is an advanced treatment of descriptive and inferential statistics with emphasis on the latter. Students will gain practical experience in analyzing current data from the social sciences through the use of statistical computer programs. Topics include: sampling, measures of central tendency and dispersion, probability theory, hypothesis testing, point and interval estimation, the normal, binomial, and chi-square distributions, parametric and non-parametric measures of association and correlation, and bi-variate regression.
3 credits, ABCF grading

SOC 502 Multivariate Regression Techniques

This course provides an in-depth overview of regression analysis, primarily focused on OLS modeling. Topics include: inferences in regression analysis, dummy variables, inter-

action terms, and diagnostics and remedial measures. The course concludes with an introduction to other regression techniques such as logistic and probability modeling.
3 credits, ABCF grading

SOC 503 Multivariate Analysis of Social Data

The general linear model and multivariate analysis, including dummy variable analysis, multiple covariance, multivariate analysis of variance, and factor analysis.
Prerequisite: SOC 502 or permission of instructor
3 credits, ABCF grading

SOC 504 Logic and Practice of Sociology

This course provides an introduction to the logic of empirical research in sociology. It takes a broad overview of both quantitative and qualitative methods; inductive and deductive reasoning; and the process of theory construction and testing, with an emphasis on research design and the logic of causal analysis. A knowledge of advanced statistics is not assumed. Topics covered include survey research, participant observation and field methods, the comparative method, experimental and quasi-experimental design, content analysis, and the logic of multivariate analysis.
3 credits, ABCF grading

SOC 505 Classical Sociological Theory

A review of the intellectual development of the discipline, its epistemological foundations, and classical theoretical statements.
Fall, 3 credits, ABCF grading

SOC 506 Contemporary Sociological Theory

A review of the current major theoretical orientations and newly developing theoretical perspectives.
Spring, 3 credits, ABCF grading

SOC 508 Experimental Methods

The design, conduct, and analysis of laboratory and field experiments.
3 credits, ABCF grading

SOC 509 Field Work

Practicum in field interviews and observations; problems of rapport, reliability, and validity.
3 credits, ABCF grading

SOC 510 Historical Methods in Sociology

Major approaches, philosophical problems of, and methods used in historical sociology. Topics covered include causal analysis, macrosociological comparisons, case-oriented versus variable-oriented approaches, ideal types, comparative typologies, narrative, and issues of significance and objectivity. Special attention is given to the problem of concept formation.
3 credits, ABCF grading

SOC 511 Population Analysis

A survey of demographic theory and research. Determinants and consequences of population size, growth rates, composition and spatial distribution, family formation, fertility, mortality, and migration.
Prerequisite: One course in statistics
3 credits, ABCF grading

SOC 512 Global Sociology, Identities, and Organizations in Global Perspective

This course examines how increasing global integration impacts human societies. It reviews the broad trends that foster globalization in the economic, political, cultural, and social spheres, as well as the consequences global change has had on how individuals and communities identify themselves and how they organize for collective goals. Core issues on the global agenda such as conflict, environment, technological and economic development, demographic change, gender, and human rights will be addressed; research methods for the study of global society will be introduced.

3 credits, ABCF grading

SOC 513 The Metropolitan Community

Determinants and consequences of the growth of urban settlements. Their demographic composition and spatial structure. Problems in metropolitan community organization.

3 credits, ABCF grading

SOC 521 Social Interactions

The study of interaction in formal and informal settings. The reciprocal influence among group structure, norms, and interactive processes. A prior course in social psychology is assumed.

3 credits, ABCF grading

SOC 522 Socialization and the Self

Socialization as a continuous process throughout the life cycle. Social and cultural sources of identity. Self-other systems as a form of social control. A prior course in social psychology is assumed.

3 credits, ABCF grading

SOC 523 Sociology of Education

Relationships between education and other institutions. Internal dynamics of the school and the classroom.

3 credits, ABCF grading

SOC 531 Stratification

Causes and consequences of the unequal distribution of wealth, power, prestige, and other social values in different societies. Changes in the stratification system as a result of industrialization and revolution.

3 credits, ABCF grading

SOC 532 Complex Organizations

Division of labor, communication, and decision-making in large and formally administered organizations, such as industrial concerns, governmental agencies, political parties, trade unions, schools, hospitals, and prisons.

3 credits, ABCF grading

SOC 541 Conflict and Violence

Conflict and violence related to social change. Examination of community controversies, social movements, and uprisings.

3 credits, ABCF grading

SOC 542 Deviance

Survey of recent research literature on various kinds of deviance (crime, delinquency, and morally stigmatized behavior). Controversial issues in theory and research methods.

3 credits, ABCF grading

SOC 545 Social Movements and Collective Behavior

Unorganized collectives and their role in change. Studies of specific social movements and other collective behavior episodes.

3 credits, ABCF grading

SOC 549 Social Change

The image of technological, generational, and cultural forces on social organization from historical and comparative perspectives.

3 credits, ABCF grading

SOC 555 War and the Military

A comparative and historical study of the social organization of war and the military; causes, conduct, and consequences of war.

3 credits, ABCF grading

SOC 556 Political Sociology

The study of political institutions and of the politically relevant actions and attitudes of individuals and groups. Particular stress is placed on the reciprocal relationship between social movements and political institutions.

3 credits, ABCF grading

SOC 561 Sociology of Intellectual Life

A comparative and historical analysis of the social conditions leading to the development of intellectual professionals.

3 credits, ABCF grading

SOC 562 Sociology of the Arts

The relations between social structure, social change, and the development of major art forms.

3 credits, ABCF grading

SOC 563 Sociology of Science

The relations between science and society; social influences on the choice of problems and methods; the social organization of scientific research.

3 credits, ABCF grading

SOC 564 Communications

The social organization of the communications industry; the effects of mass communication.

3 credits, ABCF grading

SOC 571 Sociology of Health and Medicine

Social factors in health and illness; the socialization of health practitioners; the social organization of hospitals, clinics, and other facilities.

3 credits, ABCF grading

SOC 590 Independent Study

Intensive reading, under supervision of one or more instructors, of material not covered in the formal curriculum.

1-12 credits, S/U grading

May be repeated for credit

SOC 591 Special Seminars

Topics to be arranged. The seminar is built around actual research activities of students and faculty. The following topics have been covered: Cultural Theory; Sociology of Technology; Micro-sociology; Advanced Topics in Marxist Theory; Sociology of Emotions; Historical Methods; Ethnic Relations; Biosociology; Comparative Stratification; Max Weber; Sociology of the Future; Science of Sociology

and Everyday Life; The Study of the World's Advanced Societies; Methods of Behavioral Observation; Social Structure; Sociology of the Family; Cognitive Sociology; Sociology of Work; Transnational Social Movements; Economic Sociology; War and Revolution; Sociology of Gender; Sociology of Culture; Development of Capitalism; Film as a Sociological Research Tool; Funding and Grant Writing; The Three Faces of Social Psychology; A Structural Approach to Organizational Behavior; Professionals and Professionalism; Sociology of Modernity; Globalization and Immigration; Research Support in Sociology; Sociology of Sexual Behavior; Global Sociology; Gender and the Law; Poverty and Homelessness.

Prerequisite: Enrolled in a graduate

Sociology program

3 credits, ABCF grading

May be repeated for credit

SOC 595 Special Seminars

Topics to be arranged. The seminar is built around actual research activities of students and faculty. The following topics have been covered: Cultural Theory; Sociology of Technology; Micro-sociology; Advanced Topics in Marxist Theory; Sociology of Emotions; Historical Methods; Ethnic Relations; Biosociology; Comparative Stratification; Max Weber; Sociology of the Future; Science of Sociology and Everyday Life; The Study of the World's Advanced Societies; Methods of Behavioral Observation; Social Structure; Sociology of the Family; Cognitive Sociology; Sociology of Work; Transnational Social Movements; Economic Sociology; War and Revolution; Sociology of Gender; Sociology of Culture; Development of Capitalism; Film as a Sociological Research Tool; Funding and Grant Writing; The Three Faces of Social Psychology; A Structural Approach to Organizational Behavior; Professionals and Professionalism; Sociology of Modernity; Globalization and Immigration; Research Support in Sociology; Sociology of Sexual Behavior; Global Sociology; Gender and the Law; Poverty and Homelessness.

3 credits, ABCF grading

May be repeated for credit

SOC 598 Research

Execution of a research project under the supervision of one or more faculty members.

1-12 credits, S/U grading

May be repeated for credit

SOC 603 Advanced Topics in Quantitative Analysis

Mathematical and statistical methods in the analysis of quantitative data.

Prerequisite: SOC 501, 502, and 503

3 credits, ABCF grading

SOC 604 Advanced Topics in Qualitative Analysis

The use of personal documents, official records, field observations, and interviews.

3 credits, ABCF grading

SOC 606 Sociological Theory Construction

Modes of conceptualization and theory construction. Problems in developing a theory.

Prerequisite: Permission of instructor

3 credits, ABCF grading

SOC 691 Practicum for Teaching and Graduate Assistants

Individualized supervision of initial (first two semesters) teaching assistance. Discussion, examination construction, student consultation, and grading. Register for section of supervising instructor.

3 credits, S/U grading

SOC 692 Practicum in the Teaching of Sociology

The exploration of teaching goals, processes, and outcomes. Practice lectures are videotaped and discussed; classroom visits; planning, outlining, selection of course material; writing of syllabus for Introductory Sociology section to be taught as part of SOC 693 in following semester.

3 credits, ABCF grading

SOC 693 Practicum for Graduate Teaching Interns

Supervised teaching of a section of Sociology 105 using the outlines, materials, and techniques developed in SOC 692. Includes weekly meetings of all persons registered for SOC 693 and observation of classes by both faculty and fellow graduate students.

Prerequisite: SOC 692

3 credits, ABCF grading

SOC 699 Dissertation Research on Campus

Dissertation research under direction of advisor.

Prerequisite: Advancement to candidacy (G5); major portion of research must take place on SBU campus, at Cold Spring Harbor, or at Brookhaven National Lab Fall, spring, and summer, 1-12 credits, S/U grading

May be repeated for credit

SOC 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place off campus, but in the U.S. and/or U.S. provinces (Brookhaven National Lab and Cold Spring Harbor Lab are considered on campus); all international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

SOC 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy (G5); major portion of research will take place outside the U.S. and/or U.S. provinces; domestic students have the option of the health plan and may also enroll in MEDEX; international students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed; international students who are not in their home country are charged for the mandatory health insurance (if they are to be covered by another insurance plan, they must file a waiver by the second week of classes; the charge will only be removed if other plan is deemed comparable); all international students must receive clearance from an International Advisor

Fall, spring, and summer, 1-9 credits, S/U grading

May be repeated for credit

SOC 800 Summer Research

May be repeated for credit



Technology and Society (EST)

Chairperson: David L. Ferguson, Harriman 347 (631) 632-8763

Graduate Program Director: Sheldon J. Reaven, Harriman 343A (631) 632-8768

Assistant to the Chairperson: Rita Reagan-Redko, Harriman 335 (631) 632-1057

Graduate Program Coordinator: Carole Rose, Harriman 347A (631) 632-8765

Advanced Graduate Certificate awarded: Advanced Graduate Certificate in Educational Computing and in Global Industrial Management

Degree awarded: M.S. in Technological Systems Management (*concentrations: Educational Computing, Environmental and Waste Management, Global Industrial Management*)

Technology shapes every facet of modern life. Familiarity with the characteristics, capabilities, and limitations of current and emerging technologies is indispensable to wise and effective decisions and practices in government, business, and personal life. At all levels and in all disciplines, careers in industry, government, and education ever more turn on the ability to see and seize the opportunities and address the problems that technology often presents. Technological developments are indeed re-defining these very careers and changing the workplace itself.

Managing modern technologies calls upon a synthesis of tools drawn from many areas: science and engineering, computers and information, economics and regulation, psychology and community values, design and assessment. The Master's Degree in Technological Systems Management provides professionals in all fields and people planning such careers with state-of-the-art concepts, analytical tools, and practical skills for managing specific technological systems and improving their performance.

Students may pursue one of three areas of concentration: Educational Computing, Environmental and Waste Management, or Global Industrial Management. Students take a common core of 6 credits, a block of 15 credits specific to their concentration, and 9 credits of electives. A master's project also must be completed by students in the Environmental and Waste Management and Educational Computing concentrations.

Both part-time and full-time students are accepted. Teaching or research assistantships are available to full-time students who qualify.

Advanced Graduate Certificate in Educational Computing

The Certificate prepares current and prospective teachers to use advanced technologies in learning and teaching, and helps business and industrial trainers

and educators to develop and teach computer applications, multimedia technologies, and computer-based documentation. Students elect either the school track or the business/industry track.

Advanced Graduate Certificate in Global Industrial Management

This Certificate program helps managers develop their abilities to use advanced technologies in their companies, understand their business processes, reduce waste and inefficiencies, and improve the bottom line of their companies.

Facilities

Graduate students enrolled in the Department of Technology and Society have access to several computing facilities. The University maintains a wide range of mainframe facilities and personal computing laboratories. However, the department uses its two in-house, state-of-the-art computer laboratories as hands-on enhancements of the graduate student's experience. The first lab has 20 Pentium desktop computers that operate as stand-alone or within a basic network environment. The lab is integrated into the campus WAN, with full Internet access, and a wide array of educational, academic, and professional software. Video cameras, scanners, printers, laptops, and a projection system are available for student use within the lab.

The second computer laboratory is used for research and teaching related to computer-supported collaboration, E-learning technologies, and emerging educational technologies. The lab, available for faculty and students, consists of 20 Pentium desktop computers.

Both labs are designed for student work and as open laboratories to give students the broadest, in-depth exposure to information technologies.

Admission

For admission to the M.S. program in Technological Systems Management the following are required:

A. A bachelor's degree in engineering, natural sciences, social sciences, mathematics, or a closely related area from an accredited college or university.

For admission to the Environmental and Waste Management concentration, one year of calculus (MAT 131, 132, or equivalent) is required. For admission to the Global Industrial Management concentration, an introductory calculus course (MAT 123 or equivalent) is required;

B. A minimum undergraduate grade point average of 3.0;

C. Three letters of recommendation;

D. Graduate Record Examination (GRE) General Test scores;

E. Acceptance by the Department of Technology and Society and the Graduate School.

In special cases, applicants who do not satisfy requirement A or B may be admitted on a conditional basis, and may be subject to additional course requirements.

For admission to the Advanced Graduate Certificate program, students must have a bachelor's degree and an undergraduate GPA of at least 3.0. Students with lower averages may be admitted in non-matriculated status, which may be changed upon earning six or more graduate credits applicable to the Certificate with a GPA of 3.0 or higher.

Credits for Certificate program courses may be applied to requirements for the M.S. Degree in Technological Systems Management, subject to Graduate School rules and limitations; however, no more than 12 credits may be transferred.

Faculty

Distinguished Service Professors

Ferguson, David L.¹, *Chairperson*. Ph.D., 1980, University of California, Berkeley: Quantitative methods; computer applications (especially intelligent tutoring systems and decision support systems); mathematics, science, and engineering education.

Paldy, Lester G., M.S., 1966, Hofstra University: Nuclear arms control; science policy.

Distinguished Teaching Professors

Liao, Thomas T.², Ed.D., 1971, Columbia University: Computers in education; science and technology education.

Truxal, John G., *Emeritus*. Sc.D., 1950, Massachusetts Institute of Technology: Control systems; technology-society issues.

Professors

Hogan, Joseph S., *Emeritus*. Ph.D., 1968, New York University: Planetary atmospheres; environmental satellites; climate change.

Piel, Emil J., *Emeritus*. Ed.D., 1960, Rutgers University: Decision making; technology-society issues; human-machine systems.

Teng, Tian-Lih, Ph.D., 1969, University of Pittsburgh: Electrical engineering; computer science; management of information systems; electronics commerce.

Visich, Marian Jr., *Emeritus*. Ph.D., 1956, Polytechnic Institute of Brooklyn: Aerospace engineering; technology-society issues.

Associate Professors

Kaplan, Edward, *Visiting Associate Professor*. Ph.D., 1973, University of Pennsylvania: Environmental systems engineering.

Morris, Samuel C., *Visiting Associate Professor*. Sc.D., 1973, University of Pittsburgh: Environmental science; risk analysis.

Reaven, Sheldon J., *Graduate Program Director*. Ph.D., 1975, University of California, Berkeley: Science and technology policy; energy and environment problems and issues; environmental and waste management, recycling and pollution prevention; risk analysis and life-cycle analysis; nuclear, chemical, and biological threats; technology assessment; homeland security and the war on terrorism.

Lecturers

Daly, Joanne English, M.S., 1994, Stony Brook University: Technological systems management.

Rotchford, Louise M., M.S., 1990, Polytechnic University: Management.

Schiller, Herb., *Emeritus*. M.S. Management, 1973, Polytechnic University; M.S.M.E., 1966, California Institute of Technology: Operations management; manufacturing systems.

Adjunct Lecturers

Clark, Robert, M.S., 1999, Stony Brook University: Technological systems management.

Davis, Jack, M.S., 1951, University of North Carolina: Sanitary engineering.

Kornfeld, Edward, B.B.A., 1965, Pace University.

Laspina, Peter J., M.S., 1978, C.W. Post College; M.S., 1987, Stony Brook University: Technological systems management.

Lebel, Roy, B.S., 1979, Dowling College: Aeronautics; aeronautical management.

Leonhardt, Nina, M.S., 1978, Stony Brook University: Technological systems management.

Lynch, Margaret, M.B.A., 1983, New York University: Finance and marketing.

MacLeod, Charles, M.A., 2004, Stony Brook University.

Moriarty, Kevin, M.B.A., Dowling College.

O'Connor Gerry, M.A.L.S., 1970, Stony Brook University: English.

Petralia, Thomas, MS, 1992, Stony Brook University: Technological systems management.

Reagan-Redko, Rita, M.S., 1998, Stony Brook University: Technological systems management.

Schmid, Glenn, M.S., 1981, Stony Brook University: Technological systems management.

Shak, Arnold, M.S., 1976, New York University: Computer science.

Shideler, Annette, Ed.D., 1989, Teachers College, Columbia University.

Stenton, Kenneth, M.B.A., 1992, Wharton School of Business, University of Pennsylvania.

Taveras, Marypat, M.S., 2002, Stony Brook University: Technological systems management.

Number of teaching, graduate, and research assistants, fall 2005: 5

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1992; recipient of the President's Award for Excellence in Teaching, 1993; Recipient of the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring of Under-represented Minority Students, 1997

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1993; recipient of the President's Award for Excellence in Teaching, 1993

Degree Requirements

Refer to the following lists for course requirements specific to each of the three concentrations. In general, students are expected to complete two core courses for six credits, five required courses specific to the concentration for 15 credits, and three eligible electives for nine credits.

Electives for consideration are listed for each concentration, but a student's selection of electives must be approved by his or her advisor.

Requirements for the Advanced Graduate Certificate are also displayed. Certificate program courses may be credited toward requirements for the M.S. in Technological Systems Management, but no more than 12 credits taken before matriculation in

the M.S. program will be counted toward M.S. requirements.

M.S. Program in Technological Systems Management

(See course titles and descriptions below.)

Core Courses (6 credits): EST 581, EST 582

Note: Entering students are presumed to have essential communications, computer, and mathematical skills. Otherwise, prerequisite study in these areas will be required.

Global Industrial Management Concentration

Required Courses (15 credits chosen from the following): EMP 501, EMP 502, EMP 504, EMP 506, EMP 509, EMP 517

Suggested Electives (9 credits): EMP 503, EMP 507, EMP 511, EMP 518, EST 520, EMP 521, EMP 522, EMP 523, EST 530

Educational Computing Concentration

Required Courses (15 credits): EST 565, EST 567 (formerly EST 572), EST 570, EST 571, EST 590, Master's Project

Suggested Electives (9 credits): EST 520, EST 530, EST 563 (formerly EST 583), EST 573, , EST 574, EST 575, EST 576, CEI 511, CEN 580, EST 585, EST 587, EST 588, EST 589, EST 591, EST 599

Environmental and Waste Management

Required Courses (15 credits): EST 593, EST 594, EST 595, EST 596 or EST 597, EST 590, Master's Project

Suggested Electives (9 credits): EST 550, EST 576, EST 584, EST 586, EST 588, EST 591, EST 599, CEY 503, CEY 505, CEY 509

Advanced Graduate Certificate in Educational Computing

(See course titles and descriptions below.)

A total of 18 credits (four core courses and two electives) are required.

Core Courses: EST 565, EST 567 (formerly EST 572), EST 570, EST 571

School Track

Choose one of three:

EST 563 (formerly EST 583), EST 573, EST 585

Choose one of three:

EST 591, CEI 511, CEN 580

Business Track

Choose one of three:

EMP 509, EST 520, EST 530

Choose one of three:

EST 573, EST 591, EST 596

Advanced Graduate Certificate in Global Industrial Management

Core Courses (all three must be taken):

EMP 502 Management Accounting and Financial Decision Analysis

EMP 506 Global Operations Management

EMP 509 Enterprise Information and Knowledge Systems Management

Required Courses (two of five must be taken):

EMP 501 Behavioral and Organizational Aspects of Management

EMP 503 Legal and Regulatory Aspects of Management

EMP 504 Quantitative Methods in Management

EMP 511 Starting a Business Venture

EMP 517 Quality and Value Management

Elective Courses (select one additional from required courses above or one from the following below):

EMP 518 Program/Project Management

EMP 521 New Product Development and Design

EMP 522 Strategic Marketing: Planning and Process

EMP 523 International Business and Management

EST 520 Computer Applications and Problem Solving

EST 530 Internet Electronic Commerce

EST 581 Methods of Socio-Technological Decision Making

EST 582 Systems Approach to Human-Machine Systems

Courses**EMP 501 Behavioral and Organizational Aspects of Management**

This course provides an understanding of the management process by analyzing organizational behavior. Topics include behavior in two-person situations, factors influencing attitudes and changes in organizational behavior, group influence on behavior, formal and informal organizational structures, conflict and conflict resolutions, and the dynamics of planned change.

Fall, 3 credits, ABCF grading

EMP 502 Management Accounting and Financial Decision Analysis

Fundamentals of financial and managerial accounting with emphasis on concepts, ratio and break-even analysis, financial structure, cost analysis, replacement of assets, and cash flow management.

Fall, 3 credits, ABCF grading

EMP 503 Legal and Regulatory Aspects of Management

A survey of business and regulatory law. Topics include contracts, sales, warranties, and business partnerships and corporations. An overview is provided of high technology topics such as computer law, product liability, patent, trademark, copyright, and environmental law and their impact on business.

Summer, 3 credits, ABCF grading

EMP 504 Quantitative Methods in Management

This course is a rapid introduction to the application of modern mathematical concepts and techniques in management science. Algebraic operations, mathematical functions and their graphical representation, and model formulation are reviewed. Topics covered include the following: mathematics of interest, annuity, and mortgage; algebraic and graphic methods of linear programming; PERT, CPM, and other network models; and inventory theory. Simple management-oriented examples are used to introduce mathematical formulations and extensions to more general problems. The computer laboratory is used to give students experience with PC software packages that solve problems in all course topics. Interpretation of computer outputs is also stressed.

Prerequisite: MAT 123 or equivalent

Fall, 3 credits, ABCF grading

EMP 506 Global Operations Management

A managerial approach to the concepts, issues, and techniques used to convert an organization's resources into products and services. Topics include strategic decisions for planning products, processes, and technologies, operating decisions for planning production to meet demand, and controlling decisions for planning and controlling operations through teamwork and Total Quality Management (TQM). Operational problems in

producing goods and services are reviewed.
Spring, 3 credits, ABCF grading

EMP 507 Research and Special Topics in Global Industrial Management

An individual study course for students investigating special topics relating to global industrial management.

Prerequisite: Permission of instructor

Fall and spring, 1-3 credits, ABCF grading

EMP 509 Enterprise Information and Knowledge Systems Management

This course covers the different types of enterprise systems, how they are used to manage an organization's processes, re-engineering the business with enterprise systems, and the relationship among technology, organization, and management. Knowledge-based and web-based features in modern enterprise systems will be emphasized. Database Management, Security, Control, Ethical, and Social issues of enterprise systems will be discussed.

Spring, 3 credits, ABCF grading

EMP 511 Starting a Business Venture

This course covers the necessities of beginning a business from turning a concept into a new venture and developing a business plan for a venture. Topics include how to identify and evaluate the product and its market potential; management and organization issues; production and channels of distribution; and how to present a plan to the financial community. Specific case studies and guest speakers are utilized.

Summer, 3 credits, ABCF grading

EMP 517 Quality and Value Management

Modern management's approach to quality has changed radically in the last 20 years; this course explains why and how. It covers methods used by both manufacturing and service organizations to achieve high quality: how each organizational function is involved in quality; how improving quality can reduce costs; importance of communication; importance of involving all employees; need to measure quality; and introduction to statistical quality control and how it is used.

Spring, 3 credits, ABCF grading

EMP 518 Program/Project Management

We will examine how teams can be organized, directed, and monitored so that relatively complex projects can be carried out efficiently. Topics include: planning, organizing, and controlling resources; monitoring progress toward objectives; identifying and managing risks; resolving conflicts; communicating effectively; setting priorities; and writing proposals. The systems approach will be emphasized.

Fall, 3 credits, ABCF grading

EMP 521 New Product Development and Design

This course covers how to manage enterprise innovation, corporate innovation cultures, ideation and creative thinking, product design and development processes and phases, issues in product design, collaboration between R&D, and operations/marketing. Also, this class will focus on how to use

forecasting to ensure the successful launch of a product. Case studies will be discussed.

3 credits, ABCF grading

EMP 522 Strategic Marketing: Planning and Process

This course will examine the vital role that strategic marketing and planning plays in all businesses, as well as non-profit and government organizations. Marketing's role in our economy, society and the appropriate marketing target and mix of media will also be presented. The various careers which exist in marketing and the structure of marketing plans and departments are studied. The class will create a marketing plan based on real products and present it.

3 credits, ABCF grading

EMP 523 International Business and Management

This course covers the world's marketplace, international environment, managing international business, and managing international business operations. Additional topics include cultural issues in a global marketplace, the impact of law and legal differences in the world marketplace compared to the U.S., and addressing competitive issues related to items such as a need for local contact.

3 credits, ABCF grading

EST 520 Computer Applications and Problem Solving

A problem-solving course for professionals who use applications software to address administrative and managerial problems. Students develop skills in planning, forecasting, and MIS requirements. The major applications software packages used are Excel and Access. Students learn to create advanced-level spreadsheets and data files, and use them to find optimal solutions to problems in all professions.

Summer, 3 credits, ABCF grading

EST 530 Internet Electronic Commerce

Topics addressed in this course include: technology infrastructure, business models and concepts, technological skills needed to build an E-Commerce Web site, marketing, communications, security and encryption, payment systems in E-Commerce/M-commerce. Financial transactions, advertising models, content ownership and the prospects for E-Commerce are also covered.

Summer, 3 credits, ABCF grading

EST 550 Introduction to Homeland Security

The course is a combination of lectures and laboratory experience to introduce students to critical issues and assess needs for homeland security. The course includes invited lectures by experts on special topics such as fundamentals of nuclear, chemical, and biological weapons and the associated threat to the transportation of goods and the public. The students will learn about cyber security, devices to safeguard materials from terrorist threats, safety of nuclear power plants and water supply, forensics, and emergency preparedness. The students will submit a term paper on a selected topic in lieu of the final exam. Cross listed with ESM 550 and HPH 643.

Fall and Spring, 3 credits, ABCF grading

EST 553 Nuclear Security

The course will familiarize students with the fundamentals of nuclear physics, radiation, mining, weapons, and fuel cycle, other than producing electricity, as it pertains to nuclear power plants. Topics include nuclear detection, devices to safeguard nuclear materials from terrorist threats, needed physical protection for safe handling and its relevance to Homeland Security. The course combines lectures with hands-on experience at the newly installed nuclear detection facility located at the nearby U.S. Department of Energy's Brookhaven National Laboratory. Cross listed with ESM 553 and HPH 646.

Spring, 4 credits, ABCF grading

EST 554 Chemical and Biological Weapons: Safeguards and Security

This course deals with the fundamentals of chemistry and biochemistry related to chemical weapons (CW) and biological weapons (BW) that could be used by terrorists. Topics include CW and BW history, production, control, detection, identification, and emergency response measures to deal with intended or unintended release and escape, and security measures to protect and control stockpiles. Cross listed with ESM 554 and HPH 653.

Spring, 4 credits, ABCF grading

EST 560 Risk Assessment, Regulation, and Homeland Security

The course focus is on risk assessment associated with nuclear, chemical, and biological weapons as it relates to Homeland Security. Topics include air dispersion, uncertainty analysis, exposure measurements, epidemiology, toxicology, regulatory issues, risk management, risk communication, risk perception, and risk preparedness. The course will also cover laws and regulation, discouraging terrorism, and disaster preparedness, various acts passed by the U.S. Congress to regulate water, air, and controlled substances. Cross listed with ESM 560 and HPH 656.

Fall and spring, 4 credits, ABCF grading

EST 563 Computer Literacy for Educators

This course is an introduction to computer and software basics and was formerly listed as EST 583. Students will develop an understanding of the underlying concepts and principles behind computers. Students will gain sufficient knowledge to successfully navigate the digital world. Emphasis will focus on computer literacy areas used in education and other professional environments. Students will leave this course with the ability to grasp the risks and benefits surrounding new and current computer technologies. The following areas will be addressed: electronic communication, application-based projects, information management, assessment, and the societal impacts of computer based technologies. Students having completed EST 565 in a prior semester cannot receive credit for EST 563. EST 563 and EST 565 may be taken in the same semester.

Fall, 3 credits, ABCF grading

EST 565 Instructional Technologies

This course examines issues in teaching and learning, especially the use of computers and emerging technologies to investigate unique types of learning that are made possible, or

may be more efficient, with this technology. Exposure to generic software applications, and an overview of commercial software titles and applications are provided. Students have the opportunity to work collaboratively with others in this field, and will develop a working application that could be used in an educational environment.

Prerequisite: EST 563 or permission of instructor

Fall, spring, and summer, 3 credits, ABCF grading

EST 567 The Internet and Networking for E-Learning

Students will learn the basic design concepts behind the Internet, as well as wired and wireless communication networks. Students learn effective use of the Internet and networks for active learning. Discussion topics include: the role of the Internet as a 21st-century global communication tool, ethical and societal issues as they relate to educational standards, and how to judge the benefits and risks associated with these networks. This course was formerly listed as EST 572. Not for credit if you have already taken EST 572.

Prerequisite: Computer experience

Fall, spring, and summer, 3 credits, ABCF grading

EST 570 Design of Courseware

The purpose of this course is to enhance the students' ability to develop courseware modules in their disciplines. Existing courseware modules are reviewed to illustrate the structure requirements of such modules. Each student will select topics for courseware development from his or her discipline and concentrate on module development under the individual guidance of the instructor.

Prerequisite: EST 565, EST 567

Fall and spring, 3 credits, ABCF grading

EST 571 Research Methodologies for Educational Technologies

This course evaluates the educational uses of computer technology. Course goals include understanding research methodology and literature, conducting a research study of educational technology, developing professional leadership skills, and exploring micro-worlds and constructivism. The course includes class discussions to assess the quality of research articles on educational technology.

Prerequisite: EST 565

Fall and spring, 3 credits, ABCF grading

EST 573 Design of Multimedia Courseware

This course was designed for school teachers, corporate trainers, and multimedia specialists who are interested in the use of multimedia design techniques as a teaching tool. The class is half lecture and half hands-on training in multimedia production tools. Students have a term project for which they have to create a courseware program.

Prerequisite: EST 570

Spring, 3 credits, ABCF grading

EST 574 Design of E-Learning Courseware

This course is designed for higher education faculty, K-12 administrators and teachers, educational computing coordinators, and corporate training personnel who would like to

investigate ways to enhance their educational systems through the development and implementation of E-learning applications. The focus of this course is on the design and implementation of effective modes of E-learning.

Prerequisite: EST 570

3 credits, ABCF grading

EST 575 Developing Grants and Managing Projects

This course will develop the skills necessary to take a program proposal from idea through reality with an emphasis on new technological resources available to help with this process. Topics include: techniques for successful fundraising, grant writing, program design, staffing, publicity and outreach, and reporting and evaluation. It is designed for current educators and administrators, as well as students about to enter the education, social service, and health fields.

3 credits, ABCF grading

EST 576 Geographic Information Systems in Education and Research

Students use Geographical Information Systems (GIS) software to create, manipulate, and interpret layers of interactive maps and databases. Students collect and modify geographical materials from the internet, satellite and aerial imagery, and field data. They design and test scientific inquiry-driven educational modules and/or visualizations for research and analysis on global and local geography, for use in economics, earth sciences, politics and civic action, history and sociology, global studies, and environmental planning and assessment.

Prerequisite: EST 565 or EST 595 or permission of instructor

Spring, 3 credits, ABCF grading

EST 581 Methods of Socio-Technological Decision Making

Focus is on the application of decision-making techniques to analyze problems involving technology, particularly its social impacts. Areas of study include decision making under uncertainty, decision making in a passive vs. active environment, sequential decisions, estimating payoffs, forecasting, and technology assessment. These systems-analysis techniques are used to formulate and solve a variety of socio-technological problems, especially those that arise in educational, industrial, and environmental professions.

Prerequisite: Graduate standing in department or permission of instructor

Fall, 3 credits, ABCF grading

EST 582 Systems Approach to Human-Machine Systems

Systems concepts (feedback, stability, chaos, ergonomics) and analytical tools applied to dynamic systems in which technologies and/or natural environments interact with human users, regulators, or designers. Examples: ecological systems, nuclear power plant operations, space shuttle missions, computer/Web educational technologies, regional planning. Students prepare a systems design study of an industrial, educational, or environmental device, technology, or management system.

Prerequisite: EST 581 or permission of instructor, graduate standing in the department
Spring, 3 credits, ABCF grading

EST 584 Air Pollution and Air Quality Management

The effects of air pollution on the environment and public health are explored. Primary pollutants, such as particulates, oxides of sulfur, nitrogen and carbon, hydrocarbons, lead and CFCs are considered, as are secondary pollutants, such as sulfuric acid, PAN, and surface ozone. The effect of atmospheric conditions on the dilution and dispersion of pollutants and the impact of pollution on the global atmosphere are explained. Air pollution disasters and the impacts and ramifications of the Clean Air Act of 1970, its 1990 amendments, and recent international accords are discussed. Case studies of air pollution reduction, management, and regulation in local industry are included. Other contemporary topics include the loss of stratospheric ozone and global warming due to human activities. Crosslisted with HPH 683.

Spring, 3 credits, ABCF grading

EST 585 Technology in Learning Systems

This course is designed to provide educators with an overview of uses of technology to improve instruction. Standard and innovative, nonconventional modes of learning are considered. Specific areas of study include a systems-based analysis of the design and function of learning environments, individual applications related to the student's area of professional practice, and assessment of educational uses of technology today and tomorrow. Students are exposed to various educational technologies and they make a formal presentation applying a technology to an educational system.

Prerequisite: EST 582, systems background, or permission of instructor

3 credits, ABCF grading

EST 586 Environmental and Waste Management in Business and Industry

Environmental and waste management practices in industrial and other institutional settings. Technologies of hazardous waste prevention, treatment, storage, transportation, and disposal are considered. Topics include: Information systems and software tools for environmental audits, regulatory monitoring and compliance, cost estimation, recycling programs, air, land, and water emissions controls and permits. Employee health, safety, education, and quality management are examined. Field trips to several Long Island institutions. Crosslisted with HPH 684.

3 credits, ABCF grading

EST 587 Today's Technology: Impact on Education and Economics

This course involves the student in studies of the science, technology, and economics of four selected areas: electronics, transportation, energy, and health sciences. Classroom time is supplemented by visits to appropriate facilities in each area; individuals and groups also plan for the use of the information in their specific areas of responsibility. For example, teachers are responsible for developing teaching strategies for use of the information in their classes and for student career advice and preparation. Those from commerce and industry learn of the powerful influence of technological development on regional eco-

nomics. This knowledge is helpful in carrying out strategic planning and forecasting within the student's organization.

3 credits, ABCF grading

EST 588 Technical Communication for Management and Engineering

The ability to communicate technical ideas clearly and effectively is critical to success in management and engineering. Hours and money are wasted when confused, distorted writing and speaking obscure the information they are intended to convey. This course will provide managers, engineers, and other technical professionals with practical methods for making their memos, reports, and correspondence clear, comprehensible, and persuasive. Students learn strategies for communicating with both nonspecialist and technical audiences, stating their purpose clearly, organizing points most effectively, and expressing ideas concisely and precisely. Special attention is given to technical presentations and to communicating in meetings.

3 credits, ABCF grading

EST 589 Technology-Enhanced Decision Making

This course examines the use of technological devices, especially computers, as aids in decision making. A treatment is given of the cognitive science and artificial intelligence methods used in the structure and operation of some systems that support human decision making. Medical diagnosis systems, business and industrial planning systems, and computer-aided dispatch systems are discussed. In addition, the application of high technology in air traffic control systems is examined.

Prerequisite: EST 581

Co-requisite: EST 582 or permission of instructor

3 credits, ABCF grading

EST 590 Seminar for MS, TSM Students

A forum for the discussion of research methods, project ideas, and proposal preparation. A final product of this seminar is an approved master's project proposal. Each student also leads a discussion of an important technology-society problem, such as censorship of the Internet, scientific decision making, or environmental regulations. Each student works with a faculty advisor on background research and preparation of the master's project proposal.

Fall, 3 credits, ABCF grading

EST 591 Independent Study in Technology and Society

The primary objective of independent study is to provide a student with opportunities to interact with faculty members who can be of assistance in his or her master's project. Students should consult individually with faculty members on workload and credit(s).

Prerequisite: EST 590 or permission of instructor

1-3 credits, ABCF grading

May be repeated for credit

EST 593 Risk Assessment and Hazard Management

A case-study approach to the assessment of risk and the management of natural and

technological hazards, with emphasis on those that can harm the environment. The course focuses on technological hazards involving energy, transportation, agriculture, natural resources, chemical technology, nuclear technology, and biotechnology, and on natural hazards such as climactic changes, droughts, floods, and earthquakes. The first part of the course consists of readings on risk assessment and hazard management and discussions of published case studies. During the second part of the course, students conduct their own case studies and use them as the basis for oral and written reports. Crosslisted with HPH 686.

Spring, 3 credits, ABCF grading

EST 594 Diagnosis of Environmental Disputes

Diagnosis of disagreements about environmental and waste problems. Tools for evaluating disputes about (1) scientific theories and environmental models, (2) definitions and analytical methodologies for estimating risk, "real" cost, net energy use, and life-cycle environmental impact, (3) regulatory and legal policy, (4) siting of controversial environmental facilities, and (5) fairness and other ethical issues. These diagnostic tools are brought to bear upon case studies of pollution prevention, recycling, nuclear waste disposal, and climate change. Crosslisted with CEY 594 and HPH 687.

3 credits, ABCF grading

EST 595 Principles of Environmental Systems Analysis

This course is intended for students interested in learning systems engineering principles relevant to solving environmental and waste management problems. Concepts include compartmental models, state variables, optimization, and numerical and analytical solutions to differential equations.

Fall, 3 credits, ABCF grading

EST 596 Simulation Models for Environmental and Waste Management

This course is intended for students interested in developing computer models for technology assessment and for environmental and waste management. Concepts developed in EST 595 Environmental Systems Engineering and Analysis are applied to real-world problems. Techniques in model development are presented in the context of applications in surface and groundwater management, acid rain, and health risks from environmental contamination. Crosslisted with HPH 689.

Spring, 3 credits, ABCF grading

EST 597 Waste Management: Systems and Principles

Students will learn about the technologies and policy options in waste management, emphasizing recycling, incineration, landfilling, and source reduction options for municipal solid waste on Long Island. Problems concerning paper, glass, plastic, organic materials, and other waste stream components will be explored. Environmental impacts and economics of landfills, materials recovery facilities, and waste-to-energy systems are examined. The institutional and regulatory climate, current and planned practices in the region, and hazardous waste will be discussed.

Crosslisted with CEY 597 and HPH 641.

3 credits, ABCF grading

EST 598 Teaching Practicum

Designed to give graduate students teaching experience. These credits cannot be counted as part of the 30 credits required for the degree.

3 credits, S/U grading

EST 599 Special Projects and Topics

A technology assessment laboratory for emerging problems and focused research. May be run as a hands-on, group research study of an important educational, environmental or waste problem (perhaps to provide an assessment to a regulatory agency or administrative system).

Spring, 3 credits, ABCF grading

EST 800 Summer Research

May be repeated for credit

CEI 511 Modern Communications: Technology Systems

The study of basic principles and concepts that underlie the design and usage of modern communications technology systems is the emphasis of this course. All effective communications systems (such as radio, TV, and radar) must be designed to match the capabilities of the human user. An example of good ergonomic design is how a hi-fi system is designed to match the hearing characteristics of humans. Students will explore the background principles that relate to communications systems, including the electromagnetic spectrum and analog and digital signals. The study of communications technology systems will also deal with the human and societal impacts.

3 credits, ABCF grading

CEN 580 Assessment of Socio-Technological Problems and Issues

The systematic study of a series of studies that relate to current socio-technological problems and issues is the content of this course. Problem areas include transportation, water and energy resources, access for the disabled, artificial hearts, and electronic funds transfer. Emphasis will be placed on the assessment of emerging technological systems and the science and mathematics that underlie these systems.

3 credits, ABCF grading

CEN 582 The Science in Science Fiction

The course will deal with an examination of various science fiction short stories and novels to evaluate the validity of the science content based upon the time of writing. Works before and after 1960 will be compared to assess how well the science fiction predicts future technologies. Video and film versions will be compared to the written stories to see how (and if) story and scientific emphasis is changed.

3 credits, ABCF grading

Theatre Arts (THR, DRM)

Chairperson: Michael X. Zelenak, Staller Center for the Arts 3046 (631) 632-7300

Graduate Studies Director: John Lutterbie, Staller Center for the Arts 3006 (631) 632-7300

Graduate Secretary: Augusta Kuhn, Staller Center for the Arts 3046 (631) 632-7280

Degrees awarded: M.A. in Theatre; M.F.A. in Dramaturgy

The Department of Theatre Arts offers two graduate programs, a 30-credit Master of Arts in Theatre and a 60-credit Master of Fine Arts in Dramaturgy. Graduate study in this department is unique in a number of ways. First, our program offers graduate students the chance to produce their own work in our theatres. Graduate students create their own theatre pieces, serve as dramaturgs for the season's offerings, and engage in the designing of productions. In the third year of the M.F.A. professional training program, our graduate students not only work in close contact with our faculty, but undertake internships with professional theatres. Second, we provide a multicultural curriculum. Among the faculty are experts in Korean drama, classical Japanese drama, Western styles of acting, and Cultural Studies. Third, our program reflects the interdisciplinary nature of the theatre arts. Among the faculty are designers, performers, playwrights, theorists, and dramaturgs, all of whom work closely with graduate students. Finally, we have recently developed an Art and Technology Laboratory in conjunction with the departments of Music and Art. Our graduates get training in computer graphics, interactive media studies, and digital performance.

The goals of the M.A. program are (1) to study the dramatic tradition and the history of the performing arts, (2) to develop an understanding of the vital relationship between theatre theory and onstage practice, and (3) to prepare students qualified to matriculate in programs of study at the M.F.A. or Ph.D. level.

The M.F.A. program focuses on the work of the dramaturg, sometimes called the literary manager. In the United States and throughout the world, the dramaturg takes a vital part in the direction of professional theatre. He or she is responsible for advising on choice of repertoire, choosing or commissioning translations of foreign plays, collaborating with directors and dramatists in research of many kinds, and making public statements about policy and

productions. The dramaturg must be well informed in historical, critical, and comparative studies, and sensitive to every aspect of theatre practice. In a three-year M.F.A. professional training program, our graduate students work in close contact with our faculty and with professional theatres. Training in dramaturgy is useful even to students who later decide to pursue other careers in the theatre or other media, or in teaching at the university level. Professional dramaturgs often become directors, producers, administrators, drama critics, teachers, or playwrights, and many combine two or three different careers. Therefore, the Stony Brook program offers opportunities for students with a wide range of interests in theatre practice and dramatic criticism to pursue individual development within a professional orientation. As this program is built on the bond between theory and practice that we believe must lie at the heart of dramaturgical training, the program culminates in the professional internship and the M.F.A. project.

Interested students should request information and application forms as early as possible, especially if they plan to apply for financial aid.

Facilities

The Theatre Arts department is located in the Staller Center for the Arts, which houses a 1,106-seat proscenium stage and three black box theatres. Additional dance and theatre spaces are also available on campus. The department also uses the Fannie Brice Theatre, a flexible, intimate 75-seat performance space that is used for The Cabaret, undergraduate productions, staged readings, and as a studio classroom space. The Cabaret is run by the Stony Brook M.F.A. Dramaturgy students as a production space and theatrical laboratory. Each year, 8 to 12 productions are presented. The department has a Laboratory for Technology in the Arts and an Electronic Classroom.

The University Library is adjacent to the Staller Center and holds in excess of 27,000 volumes related to the study of theatre arts. Special collections of play

texts, including translations, and theatre archives are being developed continually. Manhattan is an easy commute by train, bus, or car, and its many theatres, exhibitions, archives, and libraries (most notably the New York Public Library of the Performing Arts at Lincoln Center) are easily accessible.

Admission

Admission to the M.A. Program in Theatre Arts

For admission to the M.A. program in Theatre Arts, the following, in addition to the minimum Graduate School requirements, are normally required:

A. A bachelor's degree from an accredited college or university;

B. Advanced undergraduate courses in theatre history, dramatic literature, and/or theatre practice;

C. Undergraduate grade point average of at least 3.0;

D. Three letters of recommendation;

E. Graduate Record Examination (GRE) General Test scores;

F. Supporting materials must include a sample of the applicant's writing as well as other materials such as scripts, essays, publications, portfolio, etc. (for the returned work, the applicant must include a stamped, self-addressed envelope with the completed application);

G. Acceptance by both the Department of Theatre Arts and the Graduate School;

H. If a student accepted into the M.A. program wishes to offer, either for credit toward the degree or for exemption from enrollment in courses required by Stony Brook, analogous courses taken at another university, he or she must present transcripts and other supporting materials for consideration by the graduate program director before the end of his or her first semester in the program (see Transfer of Credit from Other Universities).

Admission to the M.F.A. Program in Dramaturgy

This M.F.A. program is intensive, and admission to it is highly selective. For admission, the following, in addition to the minimum Graduate School requirements, are normally required:

- A. A bachelor's degree from an accredited college or university;
- B. Advanced undergraduate courses in theatre history, dramatic literature, and/or theatre practice;
- C. Undergraduate grade point average of at least 3.0;
- D. Three letters of recommendation;
- E. Graduate Record Examination (GRE) General Test scores;
- F. Supporting materials must include a sample of the applicant's writing as well as other materials such as scripts, essays, publications, portfolio, etc. (for the return of this work sample, the applicant must include a stamped, self-addressed envelope with the completed application);
- G. Acceptance by both the Department of Theatre Arts and the Graduate School;
- H. Applicants who already hold an M.A. in Theatre Arts from another institution may be admitted provisionally to the second year of the M.F.A. program. Such students are required to fulfill M.F.A. first-year course requirements not taken as part of their M.A. training elsewhere;

I. If a student accepted into the M.F.A. program wishes to offer, either for credit toward the degree or for exemption from enrollment in courses required by Stony Brook, analogous courses taken at another university, transcripts and other supporting material must be presented for consideration by the graduate program director before the end of the student's first semester in the program (see Transfer of Credit from Other Universities);

J. If so indicated on the application, an applicant for the M.F.A. program in dramaturgy can also be considered for admission to the one-year (30-credit) M.A. program in theatre arts, which runs parallel to the first year of the M.F.A. If such an applicant is admitted instead to the M.A. program, he or she may then be considered, upon successful completion of the M.A., for admission to the second year of the M.F.A. program;

K. Students in the M.F.A. program are evaluated at the end of each year of study before permission is granted to continue. If a student completing his or her first year of study is not given permission to continue, he or she may instead be redesignated as a candidate for an M.A. degree. He or she must then fulfill all requirements for that 30-credit degree (see above).

Faculty

Associate Professors

Baldwin, Phillip, M.F.A., 1987, Yale University: Scene design; interactive media; cultural studies.

Kim, Theresa, Ph.D., 1988, New York University: Asian history; acting; Eastern styles.

Lutterbie, John, *Director of Graduate Studies*. Ph.D., 1983, University of Washington: Theatre history; performance theory and criticism; dramaturgy; directing.

Mayo, Deborah, M.F.A., 1973, Yale School of Drama: Acting.

Sullivan, Amy, *Director of DanceSpace*, M.F.A., 1980, University of North Carolina, Greensboro: Dance with emphasis on performance and choreography.

Zelenak, Michael X., *Chairperson*. D.F.A., 1990, Yale University: Dramaturgy; criticism; theatre history.

Lecturers

Lantz-Gefroh, Valeri, M.F.A., 2003, Stony Brook University: Dramaturgy.

Marsh, Steve, M.F.A., 2000, Stony Brook University: Dramaturgy.

Adjunct Faculty

Jeffreys, Joe, Ph.D., 1996, New York University: Theatre history and criticism.

Prusslin, Norman L., *WUSB Director*. B.A., 1973, Stony Brook University: Broadcast management.

Affiliated Faculty

Levy, Jonathan, *Distinguished Teaching Professor*.¹ Ph.D., 1966, Columbia University: Playwriting; theatre for children; dramatic criticism; Italian Renaissance drama.

Rosen, Carol, Ph.D., 1975, Columbia University: Dramatic theory and criticism; dramaturgy; comparative modern drama.

Number of teaching, graduate, and research assistants, fall 2005: 12

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1991

2) Department of English

Degree Requirements Requirements for the M.A. Degree in Theatre

In addition to the minimum Graduate School Requirements, the following are required:

A. Courses

Courses required for the degree are:

THR 500 Introduction to Graduate Studies
THR 510 and 521 Western Theatre History and Non-Western Dramatic Literature

Or:

THR 511 and 520 Non-Western Theatre History and Western Dramatic Literature
THR 535 Theories of Theatre

Or:

THR 635 Theories of Performance
THR 550 Teaching Practicum
THR 590 M.A. Thesis (6 Credits)

In addition, students select from among a range of courses in consultation with the graduate program director and a faculty advisor. A minimum of 30 credits is required for graduation.

B. Examination

Successful completion of the M.A. exam is required, normally at the end of the second semester of full-time residence.

C. Foreign Language

Proficiency in a foreign language must be demonstrated.

D. Teaching Experience

Teaching for at least one semester at the University level is required of all graduate students.

E. Master's Thesis

A master's thesis must be successfully completed under the direction of a faculty advisor.

F. Residency Requirement

This program is normally completed in one to two years of full-time residency. Students may be enrolled in the M.A. program on a full-time or part-time basis.

G. Time Limitations

Depending on the student's first-time, matriculated enrollment in the Graduate School, full-time students must complete all degree requirements within three years, part-time students in five years.

Requirements for the M.F.A. Degree in Dramaturgy

In addition to the minimum Graduate School requirements, the following are required:

A. Courses

Courses required for the degree are:

THR 500 Introduction to Graduate Studies and Dramaturgy
 THR 505 Dramaturgy I: Production Dramaturgy
 THR 506 Dramaturgy II: Literary Management
 THR 510 and 511 Western Theatre History and Non-Western Theatre History
 THR 520 and 521 Western Dramatic Literature and Non-Western Dramatic Literature
 THR 535 Theories of Theatre
 THR 550 Teaching Practicum
 THR 635 Theories of Performance
 THR 680 Dramaturgy Workshop
 THR 690 M.F.A. Internship
 THR 691 M.F.A. Project

Recommended courses are:

THR 507 Performance Dramaturgy
 THR 523 Theatre in New York
 THR 560 Acting: Theory and Practice
 THR 570 Directing: Theory and Practice
 THR 640 Scenography and New Media
 THR 650 Playwriting Workshop
 THR 660 Acting Workshop

In addition, students select from a range of courses in consultation with the graduate program director and a faculty advisor. A minimum of 60 credits is required for graduation.

B. Examination

Successful completion of the M.F.A. exam is required, normally at the end of the second semester of full-time residency.

C. Projects

Successful completion of the following projects is required:

THR 680 Dramaturgy Workshop
 (6 credits)
 THR 690 Internship (3 credits)
 THR 691 M.F.A. Project (3 credits)

D. Foreign Language

Proficiency in a foreign language must be demonstrated usually through the translation of a play.

E. Teaching Experience

Teaching for at least one semester at the University level is required of all graduate students.

F. Residence Requirement

This program is normally completed in three years of full-time residency.

One semester of the last year is spent in a professional internship program.

G. Time Limitation

The M.F.A. program is normally completed in three years. The time limit for completion of the M.F.A. program, given unusual circumstances, is six years.

University Requirements

The granting of master's degree is based upon the completion of any special departmental requirements in addition to the items listed below.

A. Courses and Grade Point Average

A student must achieve a 3.0 overall grade point average for a minimum of 30 credits of graduate work to receive the M.A. degree and 60 credits for the M.F.A. degree.

At the discretion of the department, a student who retakes a course for which an F grade was received may replace the F grade with the new grade in the G.P.A. calculation. The student may use this option for one F grade only.

B. Teaching

At least one semester of supervised teaching experience is required except for those programs in which teaching is not germane to the degree objectives.

C. Registration

Degree candidates must be registered in the program granting their degree for at least one credit in the semester in which the diploma is awarded.

Courses**THR 500 Introduction to Graduate Study in Theatre Arts**

This course surveys the field of theatre scholarship, introducing students to research tools, research methods, critical writing, and scholarly values. Discussions include reference to basic texts in dramatic literature and representative research problems.

Fall, 3 credits, ABCF grading

THR 505 Dramaturgy I: Production Dramaturgy

An introduction to production dramaturgy in which students explore the types of research and concept development necessary to prepare already produced scripts for performance. Research tools and methods, investigations of cultural and social history, critical writing, and issues in adaptation and translation are discussed. Means of facilitating communication within a production team and between actors, designers, and directors are examined. Other topics include season planning, promotion and publicity, educational outreach materials, preparation of protocols, post-play discussion, and other audience development techniques.

Fall, 3 credits, ABCF grading

THR 506 Dramaturgy II: Literary Management

Examining the roles of the literary manager in the contemporary theatre, this course explores the process of new play development and the preparation of a new play for production. The ability to read and write sensitively about new plays, reading new plays and preparing sophisticated play reports, how to talk to playwrights about their plays, and how to facilitate discussions with directors and actors as they encounter a play for the first time are issues examined in this course. New plays from a variety of venues, including professional theatres in New York City, are read and discussed, and the process of developing new plays from staged readings through public performances are studied.

Spring, 3 credits, ABCF grading

THR 507 Dramaturgy of Process: Theatre, Drama, and Performance

Students explore topics such as translation and adaptation of material, production dramaturgy, digital applications, etc.

Spring, alternate years, 3 credits, ABCF grading

May be repeated for credit

THR 510 Western Theatre History

Theatre forms in the Western tradition, from ancient to modern. This course is centered on a particular critical or theoretic problem or theme. It may be repeated as an independent study with the permission of the instructor.

Spring even years, 3 credits, ABCF grading

May be repeated once for credit

THR 511 Far Eastern Theatre and Drama

Course surveys the traditional theatre of China, Korea, and Japan as related to: history, dramatic literature (Yuan drama and Beijing Opera of China; Pongsan Korean Masked Dance-Drama; a Noh play cycle, Kabuki, and Joruri Puppet Theatre of Japan). The points of departure will be: the Eastern world view (namely Shamanism, Confucianism, Daoism, and Buddhism) and theatre; the concept of the actor's body and mind as microcosmic presentation of a macrocosmic universe; his performance as an act of becoming one with the macrocosm; and the total nature of all performing arts elements harmoniously operating together in creating beauty on stage.

Fall, 3 credits, ABCF grading

May be repeated once for credit

THR 520 Western Dramatic Literature

Course surveys forms of Western drama, with particular reference to theatrical performance. Focus is placed on key periods and themes such as gender issues, political violence, death and dying, love, etc.

Spring, odd years, 3 credits, ABCF grading

May be repeated once for credit

THR 521 South and Southeast Asian Theatre and Drama

Course surveys the traditional and modern theatre of India, Sri Lanka, Thailand, Indonesia, Tibet, Nepal, and Bhutan, as related to: mythic origins, history, dramatic literature, aesthetic theory, ritual functions, conventions of productions, and actor training. The point of departure will be cosmology,

especially that of Hindusim, and the world view of the people.

*Spring, 3 credits, ABCF grading
May be repeated once for credit*

THR 523 Theatre in New York

A workshop seminar on contemporary, alternative performance forms and mainstream theatre. Emphasis on the development of critical perspectives and the writing skills needed to articulate them through seminar discussions and writing workshops relevant to performances seen on trips to theatres in New York and the region.

Spring, 3 credits, ABCF grading

THR 525 Topics in Theatre and Drama

Intensive studies of selected forms of theatre and drama from various countries and periods, designed to supplement rather than repeat areas of study already undertaken in the curriculum.

Spring, alternate years, 1-3 credits, ABCF grading

May be repeated for credit

THR 530 Directed Reading in Theatre and Drama

Students read and evaluate the literature on a topic of special academic interest under the supervision of a faculty member.

Fall and spring, 1-3 credits, ABCF grading

May be repeated for credit

THR 535 Theories of Theatre

Theories of the theatre, from the ancient to the contemporary, are read critically to develop a complex and varied conception of the philosophical basis underlying approaches to the theatre. Theorists read might include Aristotle, Plato, Diderot, Rousseau, Nietzsche, Artaud, Brecht, Stanislavski, Grotowski, Barba, Mnouchkine, Suzuki, and Zeami.

Fall, alternate years, 3 credits, ABCF grading

THR 540 Design Theory and Practice

Course surveys principal design areas, providing information about aesthetic theory and methods of stage design. Students address design problems and analyze a topic in design theory in conjunction with readings and instruction.

Fall, 3 credits, ABCF grading

THR 550 Teaching Seminar

Supervised student teaching of undergraduate courses accompanied by a seminar in methods and strategies of teaching theatre arts at the university level. An independent teaching project, in which the student works with a particular faculty member, may be substituted.

Spring, 3 credits, ABCF grading

THR 560 Acting Theory and Practice

Course surveys the field of acting—its history, formal principles, primary techniques, and contemporary practice. Students develop course papers and, or projects in conjunction with advanced readings and instruction.

Spring, alternate years, 3 credits, ABCF grading

THR 570 Directing Theory and Practice

Course surveys the art and craft of the Director, with focus on contemporary practices of directing and approaches to pedagogy. Students will write papers and develop projects in conjunction with advanced reading and instruction.

3 credits, ABCF grading

THR 590 M.A. Thesis

Independent study and research for M.A. students, on special topics, theoretical or cultural issues, or problems. Development of material for research paper.

1-3 credits, S/U grading

May be repeated for credit

THR 591 Independent Project

Special project allowing advanced individual work in an area of theatre study or practice. Must be scheduled by arrangement with instructor. Should result in an advanced paper or project report.

Prerequisite: Permission of instructor

1-3 credits, ABCF grading

May be repeated for credit

THR 625 Theory and Criticism

Study of major issues in dramatic theory and criticism and in performance theory.

Spring, alternate years, 3 credits,

ABCF grading

May be repeated for credit

THR 630 Dramaturgy Colloquium

Through interaction with theatre professionals, students develop independent projects around topics of common concern to the profession, and develop strategies for implementing alternate plans for improving and developing theatre.

Spring, alternate years, 3 credits,

ABCF grading

May be repeated for credit

THR 635 Theories of Performance

This course examines different theories of performance as they relate to theatre and everyday life. Students explore ways of thinking about the performing body and different modes of cultural expression. There is a performing component to the course in addition to a final paper.

3 credits, ABCF grading

May be repeated twice for credit

THR 640 Theatre Design Workshop

Advanced assignments in theatre design. May include design work on departmental productions.

Fall, 3 credits, ABCF grading

May be repeated twice for credit

THR 650 Playwriting Workshop

Students write and discuss original plays, evaluate their work, study techniques of composition and formal organization, and develop strategies for audience communication. Advanced students may study techniques for revision and the development of material for performance. Some plays may be selected for department production.

Prerequisite: Permission of instructor

Fall, 3 credits, ABCF grading

THR 660 Acting Workshop

Intensive advanced study in a particular acting technique, such as Kutiyattam, Suzuki, musical theatre, Brecht, etc. Offered in conjunction with departmental productions.

Spring, alternate years, 3 credits, ABCF grading

May be repeated for credit

THR 670 Directing Workshop

Advanced training in directing, which may involve concentrated scene work, formal experiments in performance, work on period styles and problems, or preparation of performances for public showing.

Spring, alternate years, 3 credits, ABCF grading

May be repeated twice for credit

THR 680 Dramaturgy Workshop

Students serve as dramaturgs for the production of a play, providing research support, studying editorial and interpretive techniques, attending rehearsals, and developing program materials for the audience.

Spring, 3 credits, ABCF grading

May be repeated for credit

THR 690 Professional Internship

A full-term internship at a professional theatre. Students should submit an internship description in the first month of work, then a journal or evaluation of their work experience.

Spring, 6 credits, ABCF grading

THR 691 M.F.A. Project

The project is to be undertaken at a professional theatre or as part of the mainstage production season at Stony Brook University. Students submit a proposal for a project in which they have a major responsibility as an assistant dramaturg on a production or an equivalent position, or Artistic Director for the LIPP or equivalent. All proposals for projects outside of the university must be submitted in writing to the faculty supervisor and graduate program director for approval.

Spring, 3 credits, ABCF grading

THR 800 Summer Research

Independent study and research on special topics or problems related to work on the M.A. or M.F.A. degree.

S/U grading

May be repeated for credit

THR 850 Summer Teaching

Supervised student teaching of undergraduate courses accompanied by a tutorial in methods and strategies of teaching theatre arts at the university level.

S/U grading

Women's Studies (WST)

Chair: Oyeronke Oyewumi, Old Chemistry 128C (631) 632-1762

Associate Director: Sarah Hall Sternglanz, Old Chemistry 143D (631) 632-4725

Senior Staff Assistant: Colleen Wallahora, Old Chemistry 105 (631) 632-9176

Graduate Certificate awarded: Graduate Certificate in Women's Studies

The Women's Studies Program, in the College of Arts and Sciences, offers a course of study that leads to the Graduate Certificate in Women's Studies. The program has affiliated faculty members from more than 20 different programs in the social and behavioral sciences, humanities, and health sciences. The program is designed to allow students working toward a degree in departments such as English, History, Philosophy, Psychology, or Sociology to draw on faculty whose work deals with gender issues in a wide range of disciplines. Since Women's Studies has affiliates in nearly every department in the social sciences and humanities, the certificate program offers graduate students the opportunity for an unusually rich interdisciplinary experience.

The program is particularly strong in feminist theory, with faculty affiliates from the departments of Philosophy, English, Art, History, Comparative Studies, and Hispanic Languages and Literature offering courses in this area. Other areas of concentration include European and Latin American women's history, women in British, American, and Caribbean literature, women in the Third World, women in science and medicine, and queer studies.

Normally, students begin their work in the program with a seminar in feminist theory and conclude the requirements with an interdisciplinary research colloquium in women's studies that considers research methods, pedagogy, epistemology, and curriculum development. Additional courses can be chosen from a list of seminars offered by faculty affiliates on an intermittent basis; these cover such topics as the psychology of women, modern British women writers, constructions of the body, women in American history, feminism and modern drama, women and social movements, music and gender, the history and literature of reproduction, anthropological perspectives on women, and the sociology of gender. Where courses are not available for a particular topic, students may arrange directed readings with an affiliated faculty mem-

ber. Students may also count a relevant course offered in their home program toward the certificate.

It is expected that most students can fulfill the requirements for the Graduate Certificate in Women's Studies while working toward the master's, doctoral, or other degree. Students should consult with their home program to determine whether the credits earned in the certificate program can be used toward their degrees. Eight teaching assistantships are typically available for student support. Since most students receive program support in their early years, these are usually assigned to advanced students.

Students may also apply to Women's Studies for admission to a free-standing graduate certificate.

Admission

Admission to the Graduate Certificate Program in Women's Studies is open to any full-time student enrolled in a graduate degree-granting program, or to free-standing certificate students, who have completed their B.A.s. For applicants already admitted to the University, admission involves filling out a brief form. The forms and additional information are available through the Women's Studies office. For admission to the free-standing Graduate Certificate Program in Women's Studies, students are required to have earned a bachelor's degree and to have the intellectual skills to do advanced work in Women's Studies. The following material is required:

A. An official transcript of undergraduate record culminating in a bachelor's degree;

B. A minimum grade point average of 2.75 (B-) in all undergraduate coursework;

C. Letters of recommendation from three previous instructors;

D. An official report of the Graduate Record Examination (GRE) General Test results;

E. Acceptance by the Women's Studies Program and the Graduate School.

Affiliated Faculty

Distinguished Professor

Ihde, Don, *Philosophy*. Ph.D., 1964, Boston University: Phenomenology; philosophy of technology; hermeneutics.

Kaplan, E. Ann, *English and Director of the Humanities Institute*. Ph.D., 1970, Rutgers University: 19th- and 20th-century British and American literature; women's studies; film.

Distinguished Service Professor

Paldy, Lester G., *Technology and Society*. M.S., 1966, Hofstra University: Nuclear arms control; science policy.

Distinguished Teaching Professor

Goodman, Norman, *Sociology*. Ph.D., 1963, New York University: Social psychology; family; socialization.

Lemay, Helen, *History*. Ph.D., 1976, City University: Medieval and Renaissance intellectual history; women in premodern Europe.

Professors

Arens, William, *Anthropology*. Ph.D., 1970, University of Virginia: Africa; social anthropology.

Birns, Beverly, *Emerita, Social Sciences Interdisciplinary and Psychology*. Ph.D., 1963, Columbia University: Child development; psychology of women.

Bogart, Michelle, *Art*. Ph.D., 1979, University of Chicago: 19th- and 20th-century American and European art and culture.

Brandwein, Ruth, *School of Social Welfare*. Ph.D., 1978, Brandeis University: Family violence, welfare, and poverty; women in administration; organizational/social change; single-parent families; feminist frameworks; history of U.S. social policy; international social welfare.

Channon-Deutsch, Lou, *Hispanic Languages and Literature*. Ph.D., 1978, University of Chicago: 18th- and 19th-century Spanish literature; feminist theory.

Huddy, Leonie, *Political Science*. Ph.D., 1987, University of California, Los Angeles: Political psychology; public opinion; women in politics.

Kimmel, Michael, *Sociology*. Ph.D., 1981, University of California, Berkeley: Comparative and historical development; social movements; gender and sexuality.

Kittay, Eva Feder, *Philosophy*. Ph.D., 1978, City University of New York: Philosophy of language; philosophy and feminism; modern philosophy.

Larson, Brooke, *History*. Ph.D., 1978, Columbia University: Andean history; colonial and modern Latin America; women in Latin America.

Lochhead, Judith, *Chairperson, Music*. Ph.D., 1982, Stony Brook University: 20th-century music theory and history.

Munich, Adrienne, *English*. Ph.D., 1976, City University of New York: Victorian studies; modern American women poets; feminist theory; women's studies.

Nolan, Rita D., *Philosophy*. Ph.D., 1965, University of Pennsylvania: Philosophy of language; theory of knowledge; philosophy of psychology.

Rosen, Carol, *Theatre Arts*. Ph.D., 1975, Columbia University: Theory; criticism; modern drama.

Rosenthal, Joel, *Emeritus, History*. Ph.D., 1963, University of Chicago: Medieval Europe; England; social history.

Squires, Nancy K., *Psychology*. Ph.D., 1972, University of California, San Diego: Neuropsychology; neurophysiological measures of sensory and cognitive functions of the human brain, both in normal and clinical populations.

Taylor, William R., *Emeritus, History*. Ph.D., 1956, Harvard University: 19th- and 20th-century U.S. cultural and intellectual history.

Tomes, Nancy, *History*. Ph.D., 1978, University of Pennsylvania: U.S. social, medical, and women's history.

Wilson, Kathleen, *History*. Ph.D., 1985, Yale University: Modern British history; 18th- and 19th-century social and cultural history.

Wright, Patricia, C., *Anthropology*. Ph.D., 1985, City University of New York: Primate behavior and ecology; rainforest conservation; Madagascar.

Associate Professors

Bona, Mary Jo, *European Languages, Literatures, and Cultures*. Ph.D., 1989, University of Wisconsin, Madison: Italian-American literature and culture; colonial and 19th-century American literature; American women's literature.

Cash, Floris Barnett, *Africana Studies and History*. Ph.D., 1986, Stony Brook University: U.S. social and political history; African-American women.

Cooper, Helen, *English*. Ph.D., 1982, Rutgers University: Victorian, Latin American, and Caribbean literature; creative writing; women's studies.

Erickson, Christa, *Art History and Criticism; Studio Art*. MFA, University of California, San Diego: Electronic media; photography; video art.

Frank, Barbara, *Art History and Criticism; Studio Art*. Ph.D., Indiana University: African art history.

Hong, Young-sun, *History*. Ph.D., 1989, University of Michigan, Ann Arbor: Modern Germany; social theory; culture and politics in Modern Europe; gender history.

Hutner, Heidi, *English*. Ph.D., 1993, University of Washington: 17th- and 18th-century British literature; women writers; colonial discourse; feminist theory.

Kramer, Karen, *Anthropology*. Ph.D., 1998, University of New Mexico: Cultural and behavioral ecology, comparative demography, hunter-gatherer/agriculturalist comparative studies; Maya, Mexico.

Lipton, Sarah, *History*. Ph.D., 1991, Yale University: Medieval studies; social and cultural history; gender history

Livingston, Ira, *English*. Ph.D., 1990, Stanford University: Romanticism; postmodernism; constructions of the body.

Lobel, Marci, *Psychology*. Ph.D., 1989, University of California, Los Angeles: Stress and coping; women's health.

Man-Cheong, Iona, *History*. Ph.D., 1991, Yale University: Modern China and Japan; modern Chinese and Japanese women.

Mendieta, Eduardo, *Philosophy*. Ph.D., 1996, New School for Social Research: German philosophy; critical theory; American philosophy; Latin American philosophy; postcolonial theory.

Oyewumi, Oyeronke, *Sociology*. Ph.D., 1993, University of California, Berkeley: Sociology of gender, race, and knowledge; transnational feminist theory; social inequalities (regional and global).

Rashkow, Ilona, *Comparative Studies*. Ph.D., 1988, University of Maryland: Renaissance literature; feminist literary criticism; the Bible as literature.

Rawlinson, Mary C., *Philosophy*. Ph.D., 1978, Northwestern University: Feminist theory; Hegel; aesthetics; 20th-century French philosophy.

Sugarman, Jane, *Music*. Ph.D., 1992, University of California, Los Angeles: Ethnomusicology; Albanian, Yugoslavian, and Bulgarian folk music; music of Arabia, Turkey, and Iran; gender issues.

Vernon, Kathleen, *Hispanic Languages and Literature*. Ph.D., 1980, University of Chicago: Spanish and Latin American cinema; Hispanic literature; modern Spanish literature.

Wishnia, Judith, *Emerita, Social Sciences Interdisciplinary and History*. Ph.D., 1978, Stony Brook University: Women's history; labor history; European history; anti-war history.

Assistant Professors

Bacon, Jean, *School of Social Work*. Ph.D., 1997, University of South Carolina: Women and AIDS; student development; death and dying; treatment with people of color.

Cotten, Angela, *Interdisciplinary Studies: Liberal Arts*. Ph.D., 2001, Emory University: Feminist theory; philosophy; Africana social theory and literature.

Cooper, Alix, *History*. Ph.D., 1998, Harvard University: Early modern Europe; history of science; environment.

Diedrich, Lisa, *Women's Studies*. Ph.D., 2001,

Emory University: Feminist bioethics; disability studies; feminist theory; psychoanalysis.

Dinkins, Stephanie, *Art*. M.F.A., 1997, Maryland Institute College of Art: New media; photography.

Gordon, Bonnie, *Music*. Ph.D., 1998, University of Pennsylvania: Musicology; Renaissance music; and gender studies.

Henigman, Laura, *English*. Ph.D., 1991, Columbia University: Early American literature and culture; American studies; 19th-century American literature; literature and religion; women's studies.

Lim, Shirley, *History*. Ph.D., 1998, University of California, Los Angeles: U.S. social and cultural history; race, ethnicity, and gender history; popular culture.

Marshik, Celia, *English*. Ph.D., 1999, Northwestern University: British and American modernism; literature and history; women's studies.

Lecturers

Calvin, Ritch, *Comparative Literature*. Ph.D., 2000, Stony Brook University: Latina and Chicana literature and culture; feminist science fiction; reproductive technologies.

Hesford, Victoria, *Women's Studies*. Ph.D., 2001, Emory University: American studies; feminist histories; feminist cultural memory; queer history and cultural studies.

Kuchner, Joan, *Child and Family Studies and Psychology*. Ph.D., 1981, University of Chicago: Child development; motherhood; cross-cultural parenting.

Mockus, Martha S., *Comparative Studies in Discourse and Society*. Ph.D., 1999, University of Minnesota: Feminist theory; queer theory; music and performance; film theories.

Sternglanz, Sarah Hall, *Associate Graduate Program Director; Women's Studies and Psychology*. Ph.D., 1973, Stanford University: Psychology of women; sex role development; human ethology.

Adjunct Faculty

Brand, Barbara, *Librarian*. Ph.D., 1978, University of Washington: Women in the professions.

Requirements for the Graduate Certificate in Women's Studies

The Graduate Certificate Program in Women's Studies is designed to provide an interdisciplinary course of instruction for students already enrolled in a graduate degree-granting program or to those admitted to a free-standing Graduate Certificate Program. To earn the certificate, students must complete a minimum of 15 graduate credits in courses approved for the Certificate Program. Credits earned toward a grad-

uate degree in another program or department may be applied toward the Graduate Certificate in Women's Studies. Students should consult with their home programs to determine whether credits earned for the certificate can be applied to the master's or doctoral degree. Teaching assistantships may be available for advanced students.

Minimum Requirements for the Certificate

A. WST 600 History and Methods of Women's Studies;

B. One course in feminist theory (WST 601 Feminist Theory or WST 602 Social Perspectives on Feminist Theory);

C. An interdisciplinary research colloquium (WST 699 Practicum in Women's Studies). The syllabus developed in this course will be evaluated by the instructor, who will normally be the director of the Women's Studies Program;

D. The remaining six credits may be chosen from the list of approved Women's Studies graduate courses. A number of these courses are cross-listed or offered by faculty in other departments. At least three of the six credits must be taken outside the student's Ph.D. department. No more than three credits of WST 690 may be applied to the degree.

Courses

WST 510, 511, 512 Gender and Culture

A variable topics course on the many ways in which culture and gender interact. Possible topics include women in multiethnic America, women in the labor movement, and women and social policy.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

WST 559 Gender and Health

This course explores gender differences in physical and mental health through the study of psychology, sociology, medicine, and epidemiology.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

WST 595 Reading Colloquium in Women's History

A topics course dealing with such subjects as women in social movements, the place of gender in particular historical circumstances, imperialism and woman, changing views of sexuality, or relations between family policies and other political programs. This course offered as both HIS 595 and WST 595.

Spring, 3 credits, ABCF grading

WST 599 Directed Readings in Women's Studies

Students study any subject not ordinarily covered by a course offering if the reading course is supervised by a member of the Affiliates Network and approved by the director of the Graduate Certificate Program in Women's Studies. May be repeated as topic varies, but only three credits count toward the certificate.

*Spring, 1-3 credits, S/U grading
May be repeated for credit*

WST 600 History and Methods of Women's Studies

A study of the emergence of modern Western feminism provides the context for an analysis of the formation of Women's Studies as an area of pedagogy and research. The course investigates the concepts and methods appropriate to interdisciplinary research on women and gender, and how these approaches define Women's Studies as a new area of knowledge. The effects of this interdisciplinary research on assumptions and methods in the traditional disciplines will be analyzed.

*Prerequisite: Admission to the Graduate Certificate Program in Women's Studies
Fall or spring, 3 credits, ABCF grading*

WST 601 Feminist Theory

This course covers critical works of feminist theory in the humanities. Readings focus on significant works that deal either with the theory and practice of feminism or with feminist methods of scholarship.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

WST 602 Social Perspectives on Feminist Theory

This course introduces students to the main currents of feminist social, political, and intellectual theory. It will explore theories and texts and the linkages between developing feminism and such fields as economics, sociology, history, and philosophy.

Spring, 3 credits, ABCF grading

WST 610, 611 Advanced Topics in Women's Studies

A variable topics seminar course in Women's Studies for the advanced student. Topics might include feminist peace politics, women in Third World cinema, feminist theology, or feminist philosophy.

*Spring, 3 credits, ABCF grading
May be repeated for credit*

WST 690 Advanced Readings in Women's Studies

Advanced students read on any subject not normally covered by a course offering with any member of the Women's Studies Faculty Affiliates Network.

*Prerequisite: Permission of instructor and Director of the Graduate Certificate Program in Women's Studies
Spring, 1-3 credits, ABCF grading
May be repeated for credit*

WST 699 Practicum in Women's Studies

An interdisciplinary colloquium. The syllabus developed in this course will be evaluated by the instructor who will normally be the director of Women's Studies.

*Prerequisite: A graduate feminist theory course
Spring, 3 credits, ABCF grading*

Writing and Rhetoric (WRT)

Interim Director: Patricia Belanoff, (631) 632-7390

Associate Director: Anne Beaufort, (631) 632-7726

Staff Assistant: Erik Andersen, (631) 632-7390

Graduate Certificate awarded: Graduate Certificate in Composition Studies

The Program in Writing and Rhetoric, in conjunction with the English Department and the Linguistics Department, offers a course of study that leads to the Graduate Certificate in Composition Studies. The certificate program, a 15-unit graduate program accredited by the State University of New York, is designed to complement graduate work in literary studies or provide further professional development for those already teaching composition.

Composition Studies gained disciplinary status in the early 1970's because of a growing body of research focused specifically on the learning processes involved in gaining writing literacy. It is a multi-disciplinary field, drawing its theories, research, and practices from psycholinguistics, sociolinguistics, cognitive psychology, language acquisition research, genre theory, rhetorical theory, and linguistic anthropology.

Teachers who are grounded in this body of theory and research will be better equipped to identify students' writing problems and implement effective teaching strategies or to begin a doctoral research project in composition.

Individuals who could benefit from this certificate program include M.A. and M.A.T. candidates in English who are preparing for a teaching career in high school or community college teaching, Ph.D. candidates in English who would like a broad-based degree program and want to do research in Composition Studies, and high school and college teachers seeking advanced training, accreditation, or promotion.

The certificate may be completed in four semesters and may be started in the first year of graduate study or in subsequent years. It is recommended that students begin their work in the fall semester, with one of the practicum courses, so that the theoretical work in subsequent courses is grounded in first-hand experience of working with students on their writing. Graduate students who have a teaching assistantship in the Writing and Rhetoric program would take WRT/EGL 698. Master's-level students and public school

teachers with a B.A. or M.A. degree would start with WRT/EGL 592, *Problems in Teaching of Writing*.

Admission

Admission to the Graduate Certificate Program in Composition Studies is open to any student enrolled in a graduate degree-granting program at Stony Brook University or to students who have completed their B.A.s who meet the admissions criteria.

For applicants already admitted to the University, admission involves filling out a brief form. For direct admission to the Certificate Program in Composition Studies, students are required to have earned a bachelor's degree with a cumulative grade point average of 2.75 on a 4-point scale. The following must be submitted to the Program in Writing and Rhetoric for admission to the certificate program:

- A. A letter of application stating the purpose of study;
- B. A Graduate School application form;
- C. An official transcript of undergraduate record culminating in a bachelor's degree and graduate degree transcript if applicable;
- D. Two letters of recommendation from teaching supervisors and/or professors.

The forms and additional information are available through the Program in Writing and Rhetoric Office.

Program in Writing and Rhetoric
Stony Brook University
Stony Brook, New York 11794-5340

Affiliated Faculty

Bashford, Bruce, *English*. Ph.D., 1970, Northwestern University: Literary theory and the history of criticism; rhetoric and the teaching of composition; the logic of interpretation and critical argument; humanism.

Beaufort, Anne, *Program in Writing and Rhetoric*. Ph.D., 1995, Stanford University: Composition theory and pedagogy; qualitative research methods; literacy studies; expository and argumentative writing; creative non-fiction; teacher education.

Broselow, Ellen, *Linguistics*. Ph.D., 1976, University of Massachusetts-Amherst: Phonology; phonetics; second language acquisition.

Denny, Harry, *Program in Writing and Rhetoric*. Ph.D., 1996, Temple University: Rhetoric and composition; professional communication; expository and argumentative writing; rhetoric of social movements.

Finer, Daniel, *Linguistics*. 1976, University of Massachusetts-Amherst: Syntax; semantics; language acquisition.

Martinez-Pizarro, Joaquin, *English*. Ph.D., 1976, Harvard University: Literary history of the Middle Ages; classical and medieval backgrounds; comparative studies.

Executive Committee

Beaufort, Anne, Associate Director, Program in Writing and Rhetoric, Stony Brook University.

Glockner, Marvin, Associate Dean, School of Professional Development, Stony Brook University.

Joyce, Edward, Department of English, Suffolk Community College.

Kaufman, Dorit, Chair, TESOL Certification, Department of Linguistics, Stony Brook University.

Lewis, Lorna, Executive Director of Teaching and Learning, Three Village School District.

Manning, Peter, Chair, Department of English, Stony Brook University.

Rianna, Maria, Assistant Superintendent of Schools, Port Jefferson.

Certificate Requirements

The certificate, which can be completed in two years, consists of five required courses:

WRT 506/EGL 506 Studies in Literary Theory

WRT 509/EGL 509 Studies in Language and Linguistics or LIN 527 Structure of English

WRT 612/EGL 612 Composition Theory

WRT 613/EGL 613 Research in Composition

WRT 698/EGL 698 Practicum in Teaching of Writing (for Ph.D. candidates or teachers with an M.A. degree)

or WRT 592/EGL 592 Problems in the Teaching of Writing (for M.A. and M.A.T. candidates or teachers with a B.A. degree)

Note: Up to 3 units of coursework from another institution comparable to these required courses can be applied toward the certificate.

Courses

WRT 506 Studies in Literary Theory

Prerequisite: Matriculation in a graduate program or the composition studies certificate

WRT 509 Studies in Language and Linguistics

Prerequisite: Enrollment in the English M.A., Ph.D., M.A.T., or Composition Studies Certificate programs

WRT 592 Problems in Teaching Writing or Composition

This course provides an overview of writing pedagogy as applied to tutoring in a writing center or in an English classroom. Included in the course is fieldwork in the campus Writing Center.

Prerequisite: Enrollment in the English M.A., Ph.D., M.A.T., or Composition Studies Certificate programs
Fall, 3 credits, ABCF grading

WRT 612 Theories in Composition

This course explores the relationship between reading and writing skills, the differences between speech production and writing production, and the relationship between literacy, culture, and language politics.

Prerequisite: Enrollment in the English Ph.D. program or Composition Studies Certificate program and completion of either WRT/EGL 592 or WRT/EGL 698
Spring, alternate years, 3 credits, ABCF grading

WRT 613 Research in Composition

This course provides an introduction to the nature of empirical research in Composition Studies. Students will survey landmark research studies, learn how to read research reports critically, and conduct a mini-research project in their own classrooms or tutoring situations to analyze underlying causes of students' writing problems.

Prerequisite: Enrollment in the English Ph.D. program or Composition Studies Certificate program and completion of either WRT/EGL 592 or WRT/EGL 698
Spring, alternate years, 3 credits, ABCF grading

WRT 614 Topics in Composition and Writing

This course can be a directed reading in particular areas of interest for classroom teachers, or a pilot study to prepare for the Ph.D. dissertation in Composition Studies. The shape of the course will be geared to the needs of those enrolled.

Prerequisite: Enrollment in the English Ph.D. program or Composition Studies Certificate program
3 credits, ABCF grading
May be repeated for credit

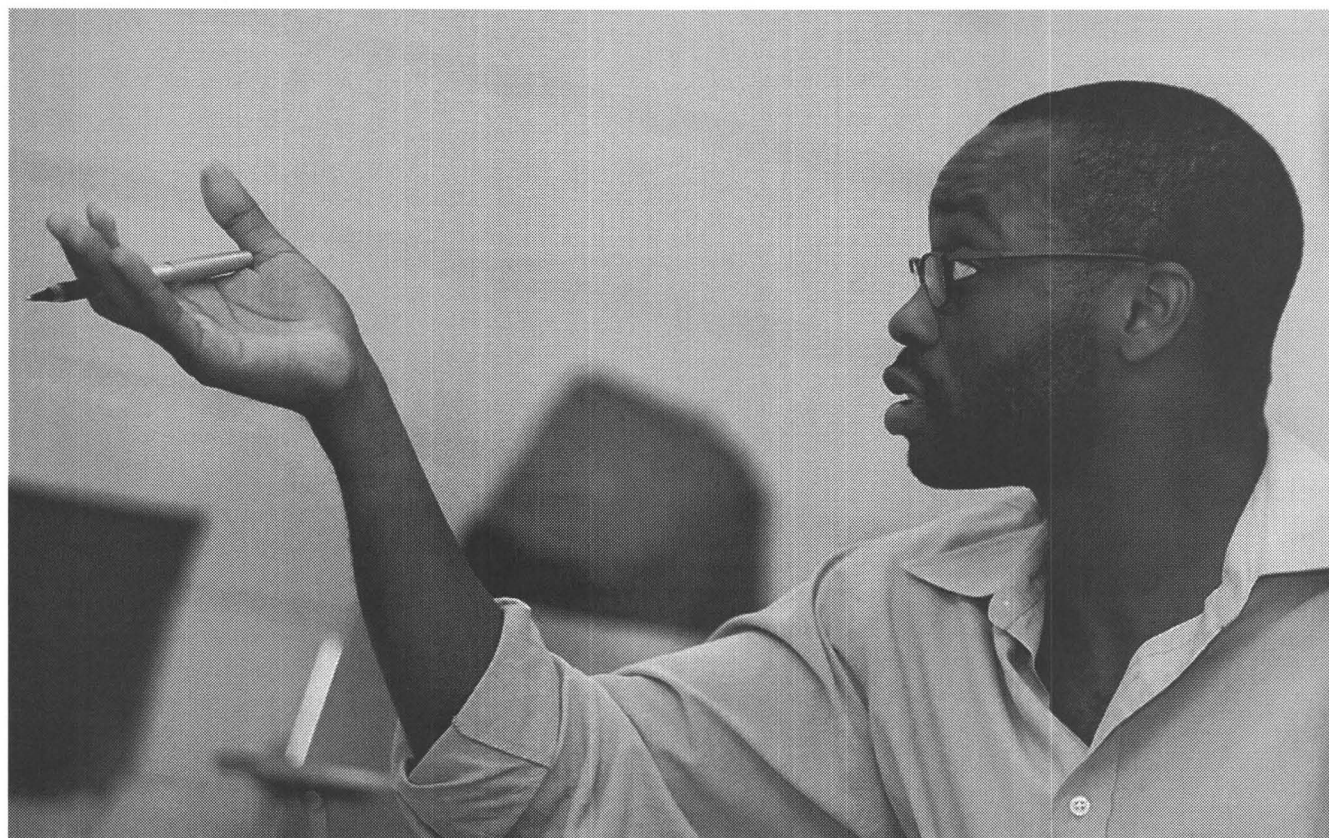
WRT 690 Directed Readings

May be repeated for credit

WRT 698 Practicum in Teaching Writing

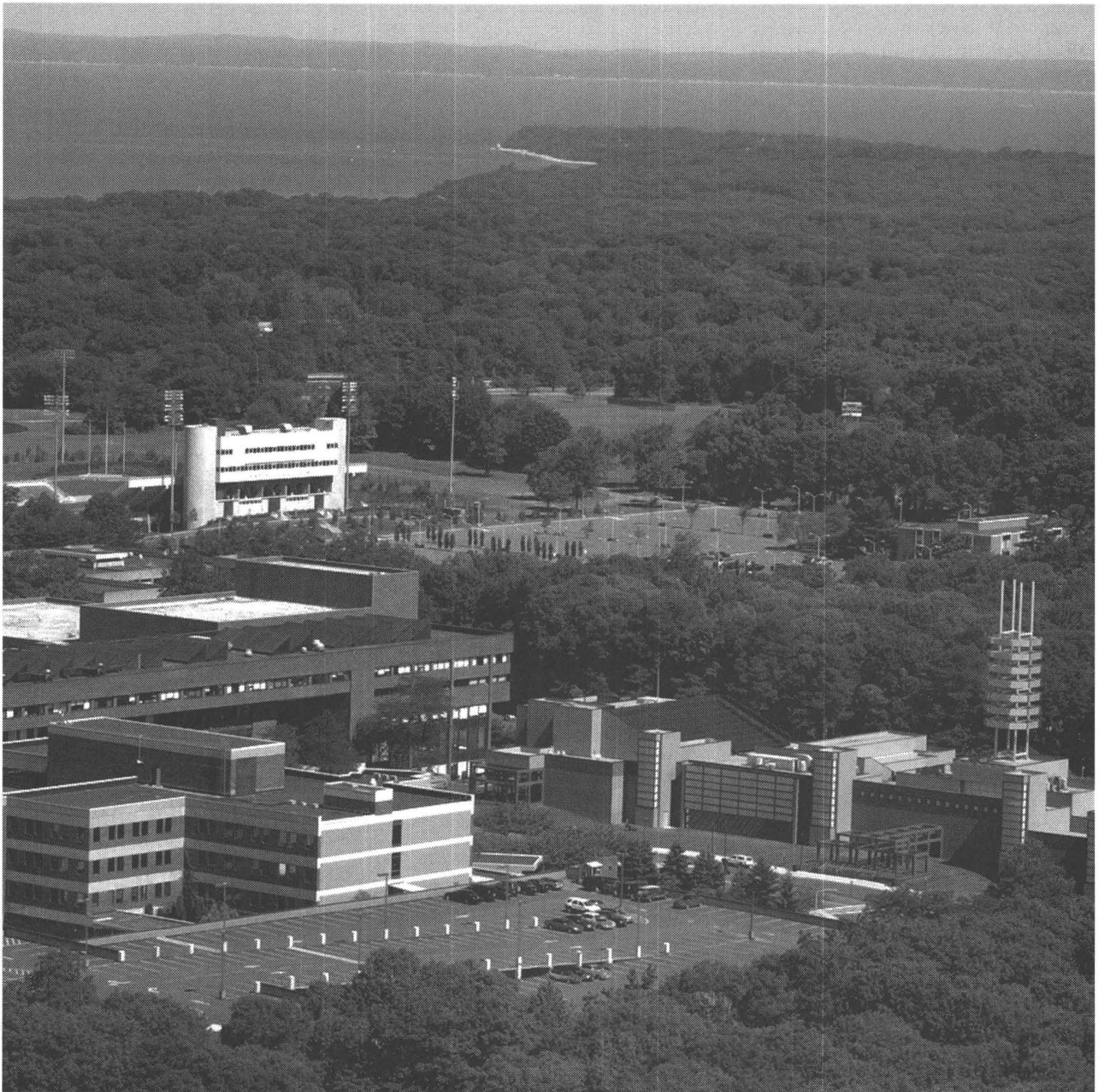
Students take the seminar in conjunction with teaching a section of WRT 101. This course provides hands-on experience and instruction in the basics of writing pedagogy, including designing writing assignments, sequencing assignments, motivating writing, writing skill development and evaluating writing. Students will also be given a preliminary overview of the major theories driving composition pedagogy.

Prerequisite: Matriculation in a graduate program
Fall, 3 credits, S/U grading





Directories, Maps, Index, Subject Codes



STATE UNIVERSITY OF NEW YORK

General Statement

State University's 64 geographically dispersed campuses bring educational opportunity within commuting distance of virtually all New York citizens and compose the nation's largest centrally managed system of public higher education.

When founded in 1948, the University consolidated 29 state-operated, but unaffiliated, institutions. In response to need, the University has grown to a point where its impact is felt educationally, culturally, and economically the length and breadth of the state.

More than 400,000 students are pursuing traditional study in classrooms or are working at home, at their own pace, through such innovative institutions as Empire State College, whose students follow individualized and often nontraditional paths to a degree. Of the total enrollment, approximately 36 percent of the students are 25 years of age or older, reflecting State University's services to specific constituencies, such as refresher courses for the professional community, continuing educational opportunities for returning service personnel, and personal enrichment for more mature persons.

State University's research contributions are helping to solve some of modern society's most urgent problems. It was a State University scientist who first warned the world of potentially harmful mercury deposits in canned fish, and another who made the connection between automobile and industrial exhaust combining to cause changes in weather patterns. Other University researchers continue important studies in such wide-ranging areas as immunology, marine biology, sickle-cell anemia, and organ transplantation.

More than 1,000 public service activities are currently being pursued on State University campuses. Examples of these efforts include special training courses for local government personnel, state civil service personnel, and the unemployed; participation by campus personnel in joint community planning or project work; and campus-community arrangements for community use of campus facilities.

A distinguished faculty includes nationally and internationally recognized figures in all the major disciplines. Their efforts are recognized each year in the form of such prestigious awards as Fulbright-Hayes, Guggenheim, and Danforth fellowships.

The University offers training in a wide diversity of conventional career fields, such as business, engineering, law,

medicine, teaching, literature, dairy farming, medical technology, accounting, social work, forestry, and automotive technology. Additionally, its responsiveness to progress in all areas of learning and to tomorrow's developing societal needs has resulted in concentrations that include the environment, urban studies, computer science, immunology, preservation of national resources, and microbiology.

SUNY programs for the educationally and economically disadvantaged have become models for delivering better learning opportunities to a once forgotten segment of society. Educational Opportunity Centers offer high school equivalency and college preparatory courses to provide young people and adults with the opportunity to begin college or to learn marketable skills. In addition, campus-based Educational Opportunity Programs provide counseling, developmental education, and financial aid to disadvantaged students in traditional degree programs.

Overall, at its EOCs, two-year colleges, four-year campuses, and university and medical centers, the University offers more than 4,000 academic programs. Degree opportunities range from two-year associate programs to doctoral studies offered at 12 senior campuses.

The 30 two-year community colleges operating under the program of State University play a unique role in the expansion of educational opportunity. They provide local industry with trained technicians in a wide variety of occupational curricula, and offer transfer options to students who wish to go on and earn advanced degrees.

The University passed a major milestone in 1985 when it graduated its one-millionth alumnus. The majority of SUNY graduates pursue careers in communities across the state.

State University is governed by a board of trustees, appointed by the governor, that directly determines the policies to be followed by the 34 state-supported campuses. Community colleges have their own local boards of trustees whose relationship to the SUNY board is defined by law. The state contributes 33 to 40 percent of their operating costs and 50 percent of their capital costs.

The State University motto is "To Learn—To Search—To Serve."

Campuses

University Centers

State University of New York at Albany
State University of New York at Binghamton
State University of New York at Buffalo
State University of New York at Stony Brook

Colleges of Arts and Science

State University College at Brockport
State University College at Buffalo
State University College at Cortland
State University of New York Empire State College
State University College at Fredonia
State University College at Geneseo
State University College at New Paltz
State University College at Old Westbury
State University College at Oneonta
State University College at Oswego
State University College at Plattsburgh
State University College at Potsdam
State University College at Purchase

Colleges and Centers for the Health Sciences

State University of New York Health Science Center at Brooklyn
State University of New York Health Science Center at Syracuse
State University of New York College of Optometry at New York City
Health Sciences Center at SUNY at Buffalo*
Health Sciences Center at SUNY at Stony Brook*

Colleges of Technology and Colleges of Agriculture and Technology

State University of New York College of Technology at Alfred
State University of New York College of Technology at Canton
State University of New York College of Agriculture and Technology at Cobleskill
State University of New York College of Technology at Delhi
State University of New York College of Technology at Farmingdale
State University of New York College of Agriculture and Technology at Morrisville
State University of New York College of Technology at Utica/Rome** (upper-division and master's programs)
Fashion Institute of Technology at New York City***

Specialized Colleges

State University of New York College of Environmental Science and Forestry at Syracuse
State University of New York Maritime College at Fort Schuyler

Statutory Colleges****

New York State College of Agriculture and Life Sciences at Cornell University
New York State College of Ceramics at Alfred University
New York State College of Human Ecology at Cornell University
New York State School of Industrial and Labor Relations at Cornell University
New York State College of Veterinary Medicine at Cornell University

Community Colleges

(Locally sponsored two-year colleges under the program of State University)

Adirondack Community College at Glens Falls
 Broome Community College at Binghamton
 Cayuga County Community College at Auburn
 Clinton Community College at Plattsburgh
 Columbia-Greene Community College at Hudson
 Community College of the Finger Lakes at Canandaigua
 Corning Community College at Corning
 Dutchess Community College at Poughkeepsie
 Erie Community College at Williamsville, Buffalo, and Orchard Park
 Fashion Institute of Technology at New York City***
 Fulton-Montgomery Community College at Johnstown
 Genesee Community College at Batavia
 Herkimer County Community College at Herkimer
 Hudson Valley Community College at Troy
 Jamestown Community College at Jamestown
 Jefferson Community College at Watertown
 Mohawk Valley Community College at Utica
 Monroe Community College at Rochester
 Nassau Community College at Garden City
 Niagara County Community College at Sanborn
 North Country Community College at Saranac Lake
 Onondaga Community College at Syracuse
 Orange County Community College at Middletown
 Rockland Community College at Suffern
 Schenectady County Community College at Schenectady
 Suffolk County Community College at Selden, Riverhead, and Brentwood
 Sullivan County Community College at Loch Sheldrake
 Tompkins Cortland Community College at Dryden
 Ulster County Community College at Stone Ridge
 Westchester Community College at Valhalla

* The Health Sciences Centers at Buffalo and Stony Brook are operated under the administration of their respective university centers.

** This is an upper-division institution authorized to offer baccalaureate and master's degree programs.

*** While authorized to offer such baccalaureate and master's degree programs as may be approved pursuant to the provisions of the Master Plan in addition to the associate degree, the Fashion Institute of Technology is financed and administered in the manner provided for community colleges.

**** These operate as "contract colleges" on the campus of independent universities.

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STONY BROOK UNIVERSITY**Members of the Council**

Subject to the powers of State University trustees defined by law, the operations and affairs of Stony Brook University are supervised locally by a council. The council is appointed by the Governor, with the exception of a student member, who has all the rights and responsibilities of the other members, and who is elected by the student body. All positions listed as of June 1, 2006.

Richard T. Nasti, Chairperson
 Andrei Antonenko
 John J. Corrado
 Diana Dominguez-Weir
 Robert H. Flynn
 John C. Gallagher
 Louis T. Howard
 Karan Kumar
 Frank Petrone

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All positions listed as of June 1, 2006.

Shirley Strum Kenny, President
 Robert McGrath, Provost and Executive Vice President for Academic Affairs
 Norman H. Edelman, M.D., Vice President of the Health Sciences Center
 Gail Habicht, Vice President for Research
 Peter Baigent, Vice President for Student Affairs
 Jack Gallagher, Interim Director and CEO of Stony Brook University Hospital
 Yacov Shamash, Vice President for Economic Development and Dean, College of Engineering and Applied Sciences
 Lance King, Vice President of Advancement and President of the Stony Brook Foundation
 Frances Brisbane, Dean, School of Social Welfare

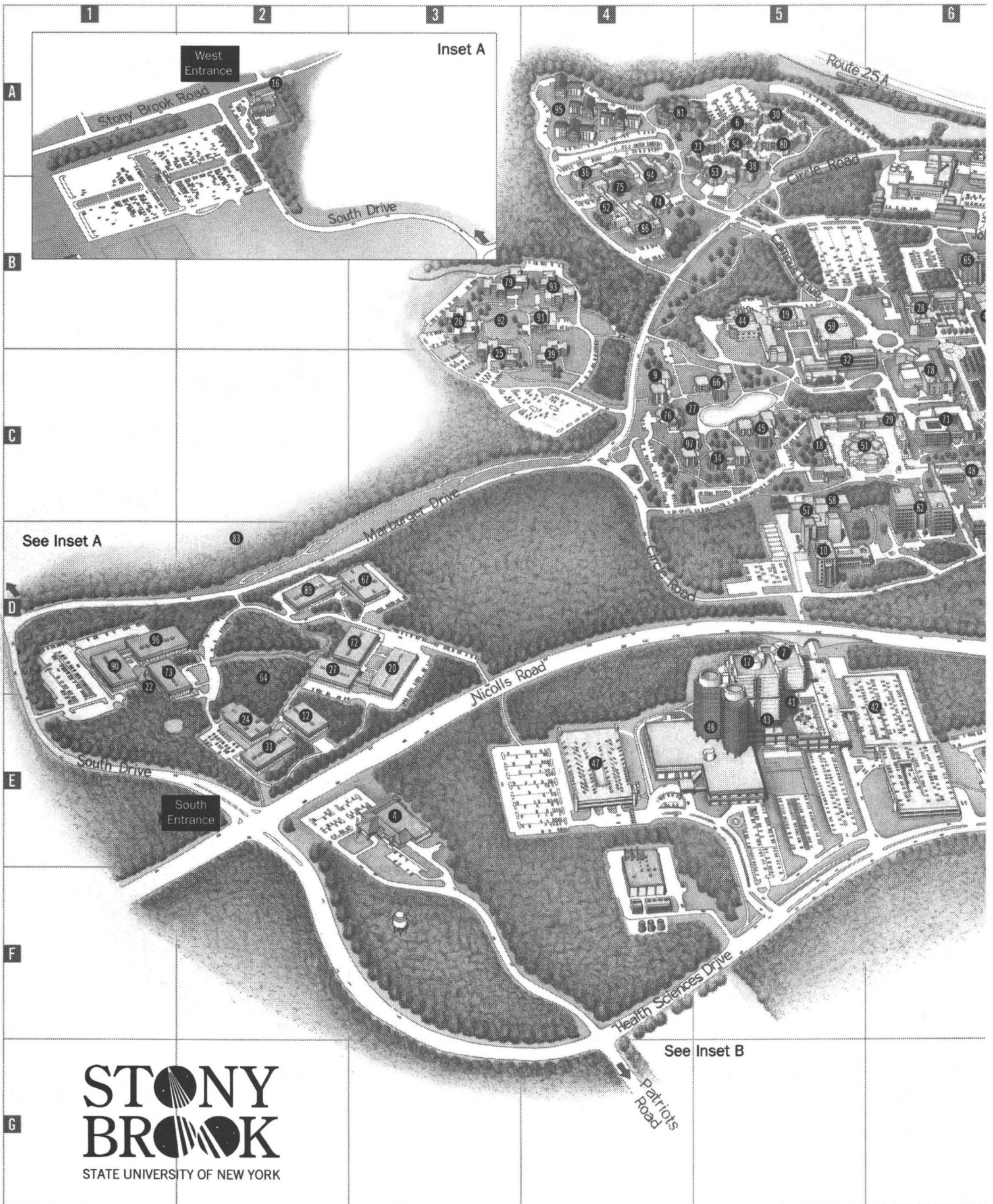
David Conover, Dean and Director, Marine Sciences Research Center
 Paul J. Edelson, Dean, School of Professional Development
 E. Christian Filstrup, Dean and Director of Libraries
 Richard N. Fine, Dean, School of Medicine
 James Fiore, Director of Athletics
 Craig Lehmann, Dean, School of Health Technology and Management
 James V. Staros, Dean, College of Arts and Sciences
 Richard Mann, Vice President for Administration
 Lawrence Martin, Dean, Graduate School
 Lenora J. McClean, Dean, School of Nursing
 Barry Rifkin, Dean, School of Dental Medicine
 Jerrold Stein, Dean of Students

The Graduate School

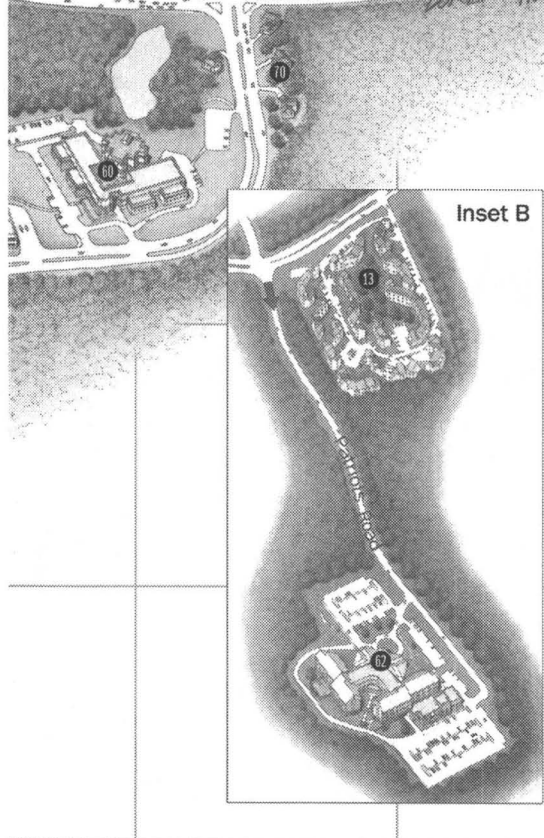
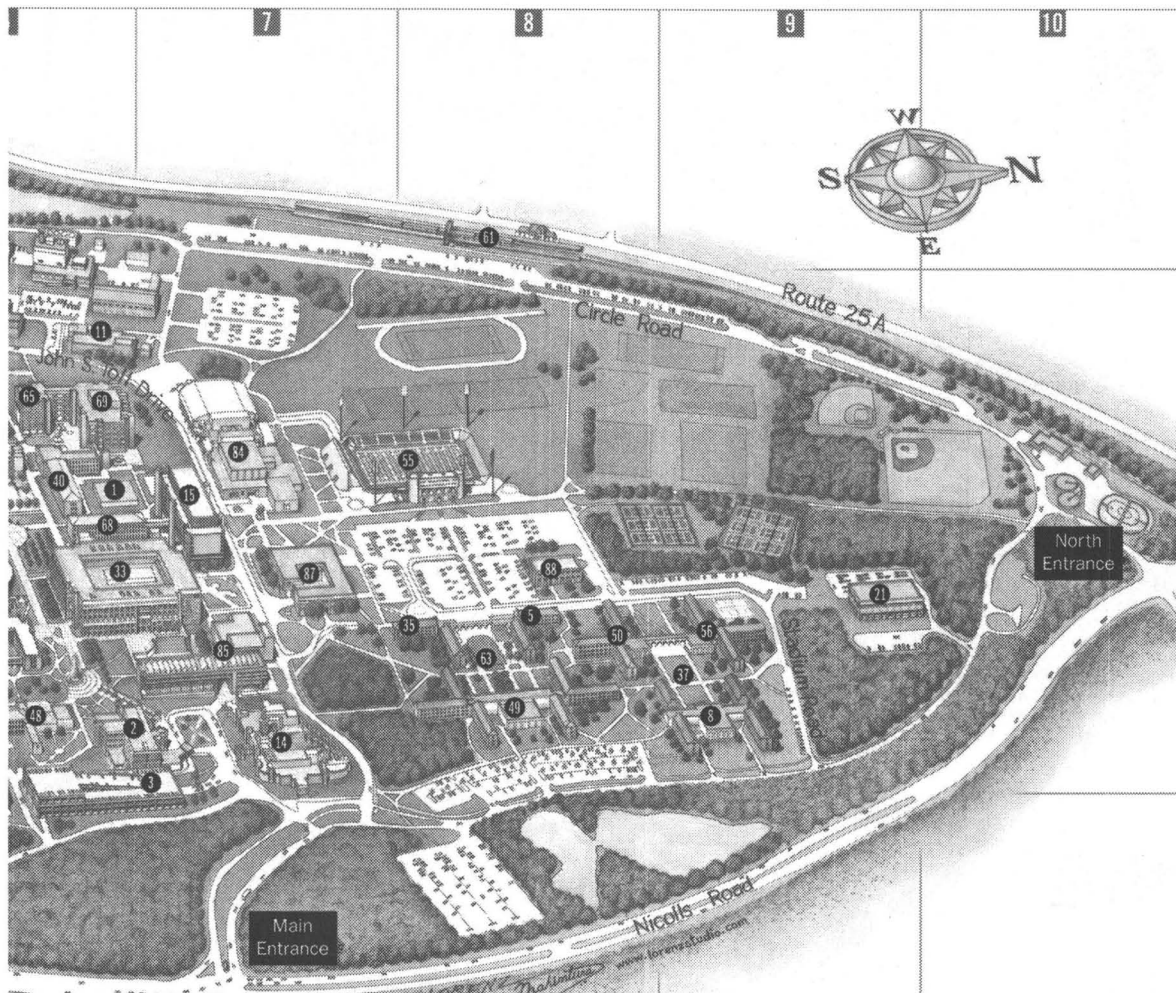
Lawrence B. Martin, Dean
 Ignacia Ruiz, Executive Assistant to the Dean
 Shaneen Washington, Assistant to the Dean
 John Peter Gergen, Associate Dean
 To Be Announced, Associate Dean for Diversity
 Kent Marks, Assistant Dean for Admissions and Records
 Barbara Byrne, Assistant Dean for Finance and Budget
 Marilyn Flores, Assistant to the Associate Deans
 Nubia Andrade, Assistant for Finance and Budget
 Monica Gentile, Senior Assistant for Admissions and Records
 Marilyn Maini, Assistant for Admissions and Records
 Lauren Scavuzzo, Assistant for Admissions and Records
 Cara Zavlick, File Clerk
 Patricia Catalano, Receptionist

International Services

Elizabeth Barnum, Assistant Dean for International Services
 Elsy Arieta-Padro, Advisor to International Faculty and Scholars
 Joe Carranza, Advisor to International Students and Scholars
 Nancy Lannak, Advisor to International Faculty and Scholars
 Antoinette D'Assomption, Advisor to International Students and Scholars
 Robert Gilpin, Advisor to International Students and Scholars
 Chris Kalesis, Advisor to International Students and Scholars
 Luisa Escandon, International Services Staff Assistant
 Emily Ntia, International Services Staff Assistant
 Obio Ntia, International Services Staff Assistant



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DIRECTIONS TO STONY BROOK

By Car

Take the Long Island Expressway (Route 495) to exit 62; follow Nicolls Road (Route 97) north for nine miles.

Ferry Connection

Connecticut car ferries run from Bridgeport to Port Jefferson (631-473-0286) and from New London to Orient Point (631-323-2525); call for schedules and information.

By Train

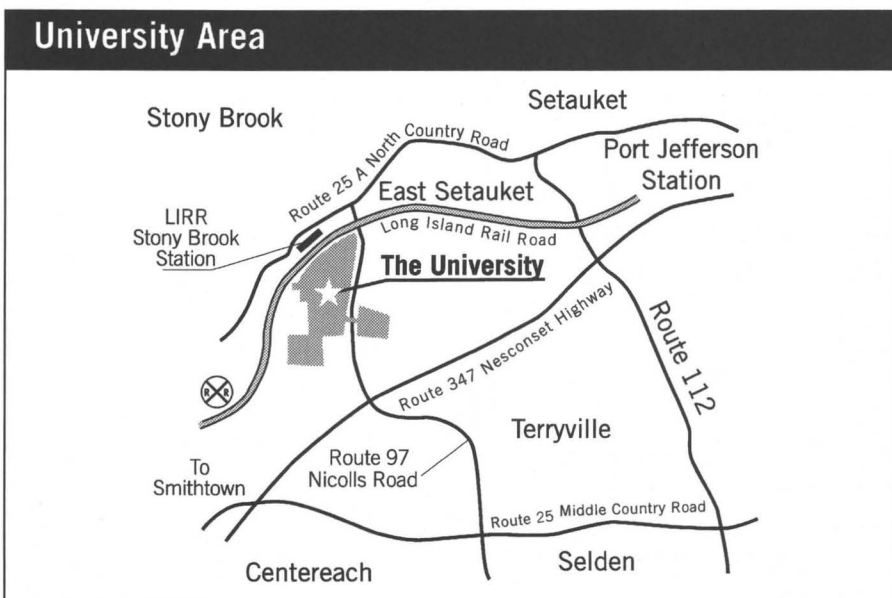
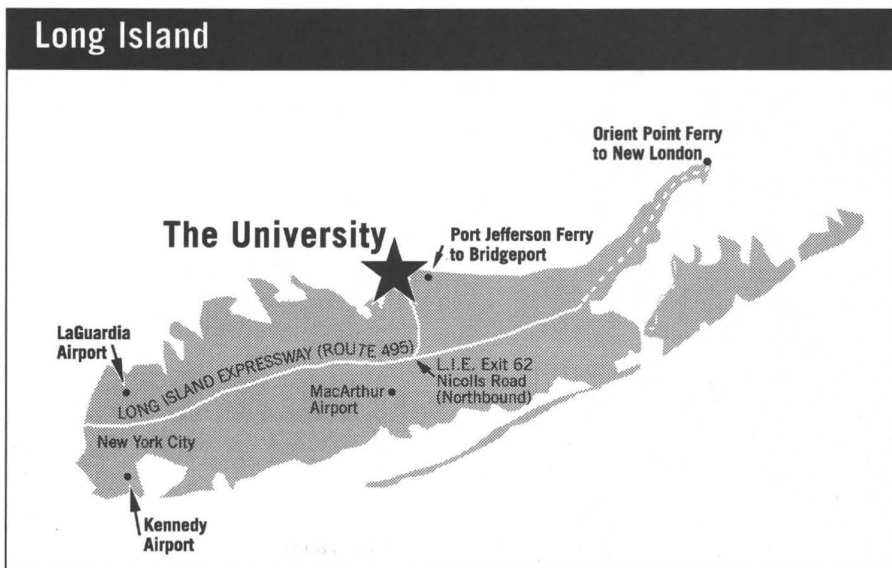
From Penn Station in Manhattan, take the Long Island Rail Road's Port Jefferson line to Stony Brook (631-231-LIRR). Cross tracks for campus bus.

By Bus

Call Suffolk County Transit (631-852-5200) for schedules, rates, and routes for buses to campus from many local towns.

By Air

Land at Kennedy or LaGuardia airports, 50 miles west of campus, or at Long Island MacArthur Airport (631-467-3210), ten miles south of campus. All airports offer limousine and taxi service to campus. In addition, AirTrain JFK transports passengers between Kennedy Airport and Long Island Railroad trains (which go directly to campus), New York City Transit subways, and local buses. For more information, visit www.panynj.gov/airtrain.



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Subject Codes

CODE	SUBJECT	CODE	SUBJECT
AMS	Applied Mathematics and Statistics	GRD	The Graduate School
ANT	Anthropology, Cultural and Archaeology	HBA	Anatomical Sciences
ARH	Art History	HBH	Pharmacology
ARS	Art, Studio	HBM	Molecular Genetics and Microbiology
BEE	Ecology and Evolution	HBP	Pathology
BGE	Genetics	HBY	Physiology and Biophysics
BIP	Biopsychology	HD	Dental Medicine
BME	Biomedical Engineering	HDO	Oral Biology and Pathology (BHS–M.S.)
NEU	Neuroscience*	HIS	History
BSB	Biochemistry and Structural Biology	HWD	Social Welfare (Ph.D.)
CHE	Chemistry	IDC	Inter-University Doctoral Consortium
CLP	Clinical Psychology	IEP	International Exchange Program
CLT	Comparative Literature	ISE	Information Systems Engineering
CSE	Computer Science	ITL	Italian
DLF	D.A. in Foreign Language–French	LIN	Linguistics
DLG	D.A. in Foreign Language–German	MAE	Mathematics Teacher Preparation
DLI	D.A. in Foreign Language–Italian	MAS	Marine Sciences**
DLL	D.A. in Foreign Language–Language Learning	MAT	Mathematics
DLR	D.A. in Foreign Language–Russian	MBA	College of Business
DLS	D.A. in Foreign Language–Spanish	MCB	Molecular and Cellular Biology
DLT	D.A. in Foreign Language–TESOL	MEC	Mechanical Engineering
DPA	Doctoral Program in Anthropological Sciences	MUS	Music (MUA, MUP)
DRM	Dramaturgy	PHI	Philosophy
ECO	Economics	PHY	Physics
EGL	English	POL	Political Science
EMP	Engineering Management	POR	Portuguese
ESE	Electrical Engineering	PSY	Psychology
ESL	English as Second Language	RUS	Russian Language and Literature
ESM	Materials Science	SCP	Social/Health Psychology
EST	Technology and Society	SLV	Slavic Languages and Literature
EXP	Cognitive/Experimental Psychology	SOC	Sociology
FLA	Foreign Language Teacher Preparation	SPN	Hispanic Languages and Literature
FRN	French	THR	Theatre Arts
FSY	Study Abroad	TMP	Technology Management Program
GEO	Geosciences	WRT	Writing and Rhetoric
GER	Germanic Languages and Literature	WST	Women's Studies

*NEU was formerly BNB

**MAS was formerly MAR and OCN

For a list of School of Professional Development codes, consult the SPD Graduate Bulletin.

1971

1972

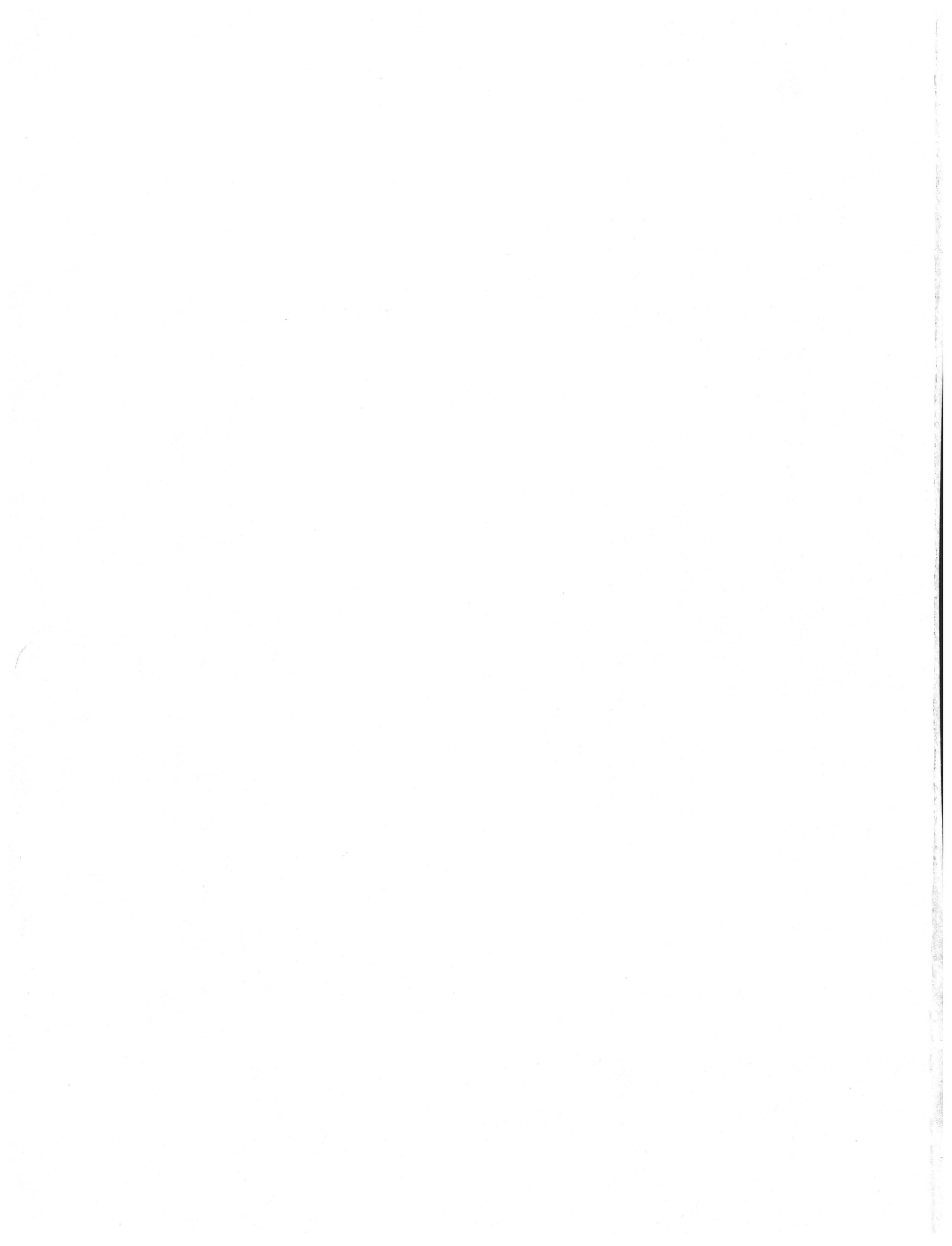
1973

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PSY 520 Psycholinguistics

The psychology of language, including the mental lexicon, sentence processing, pragmatics, discourse, production and comprehension of utterances in conversation, language and thought, first-language acquisition, and computational approaches.

Fall or spring, alternate years, 3 credits, ABCF grading

PSY 524 Cognitive Development

This course presents the developmental perspective as applied to human cognition. Topics include (1) characteristics and constraints on cognitive abilities in infancy, childhood, and adolescence; (2) mechanisms of developmental change; and (3) links between cognitive development and selected applied topics.

Fall or spring, alternate years, 3 credits, ABCF grading

PSY 533 Principles of Therapeutic Intervention

A critical review of various therapeutic procedures, and an examination of their theoretical bases and empirical support. Special focus is placed on those procedures having relevance for clinical behavior therapy.

Prerequisite: Clinical doctoral student

Fall or spring, alternate years, 3 credits, ABCF grading

PSY 534 Behavior Assessment: Theory, Research, and Practicum

Techniques of psychological measurement and assessment as they relate both to theoretical formulations and to specific clinical problems.

Prerequisites: PSY 533; clinical doctoral student

Fall, 3 credits, ABCF grading

PSY 535 Advanced Research Methods

Advanced research methods employed in clinical, personality, social, and behavioral research.

Prerequisites: PSY 501, 502; clinical doctoral student

Fall or spring, 3 credits, ABCF grading

PSY 537 Methods of Intervention: Child and Adolescent

Strategies, methods, and techniques used in a broadly construed behavioral approach to working with children and adolescents in clinical, home, school, institutional, and community settings.

Prerequisites: PSY 538; clinical doctoral student

Spring, 3 credits, ABCF grading

PSY 538 Methods of Intervention: Adult

Strategies, methods, and techniques used in a broadly construed behavioral approach to working with adults in clinical, family, work, institutional, and community settings.

Prerequisite: PSY 534; clinical doctoral student

Fall, 3 credits, ABCF grading

PSY 541 Social Psychology of Close Relationships

High level overview of current theory and research on the social psychology of close relationships.

Spring, 3 credits, ABCF grading

PSY 542 Psychology of Addictive Behaviors

Study of psychological, behavioral, and biological theories of addiction.

Spring, 3 credits, ABCF grading

PSY 543 Attachment

This course examines current psychological theories of infant-parent and child parent relationships. It also examines methods of assessment and empirical evidence regarding the influence of early experience on later close relationships, marriage, and parenting.

3 credits, ABCF grading

PSY 544 Emotions

This course focuses on such basic questions as how emotions should be defined, whether there are cross-cultural differences in how emotions are experienced or expressed, and how emotions are related to cognition. Readings include papers from classic emotions theorists such as Canon and Ekman, as well as more recent thinkers such as Zajonc. Special topics covered include emotions and psychotherapy, emotional expression in a social context, and the impact of emotions on health.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 545 Psychopathology

Theory and research on abnormal behavior such as neuroses, schizophrenia, addiction, sexual dysfunction, and childhood problems. Coverage of models of deviance, assessment, diagnosis, and treatment approaches. Broad approach to topics with stress on behavioral theories and presentation of biological and psychodynamic points of view.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 546 Measurement and Scaling

An historical introduction to the measurement of psychological variables and survey of contemporary scaling methods with an emphasis on psychophysical scaling and experimental applications.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 549 Prejudice and Discrimination

This course will provide an overview of theoretical perspectives, research methods, empirical findings, and practical applications of psychological research on prejudice, stigma, and intergroup relations. Critical thinking about theorizing and research in this area will be emphasized during class discussions and through a course project. Students are admitted with permission by instructor.

3 credits, ABCF grading

PSY 552 Social and Personality Development

A survey of milestones and processes of social development in infancy and childhood. Relevance to understanding adult personality and social relationships is emphasized.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 555 Social Psychology

An introduction to social psychology, a field of study examining how people feel about, think about, and influence others. Topics include attitudes, motivation, social judgments, and

interpersonal behaviors. Coursework focuses on identifying basic principles that transcend particular content domains.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 558 Theories of Social Psychology: Health Applications

A survey of contemporary theoretical applications to health behaviors, including social comparison processes, attribution theory and learned helplessness, social learning and self-efficacy, level of aspiration theory and models of job stress and burnout, health belief model and attitude theory, social power, and roles in the delivery of medical care.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 559 Psychology of Women's Health

This course covers a variety of psychologically important topics in women's health based on current research findings. We address psychological contributors to and consequences of women's health and illness, focusing on diseases that affect women differently or disproportionately than men (including coronary heart disease, cancer, AIDS, and autoimmune diseases), women's reproductive health (including menstruation, contraception, pregnancy, infertility, and menopause), health behaviors (including substance abuse, exercise, and eating), and other topics such as violence against women, women's mental health, and women as health care providers and health researchers.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 560 Neuropsychology

The functions of the normal and pathological primate brain in behavior. Consideration of anatomical, neurophysiological, and pharmacological correlates of behavioral functions such as perception, attention, motivation, learning, memory, cognition, and language. The behavioral consequences of various forms of brain pathology are discussed.

Fall or spring, alternate years, 3 credits,

ABCF grading

PSY 561 Cognitive and Behavioral Neuroscience I

Students discuss topics in cognitive and behavioral neurosciences, selected on the basis of the needs of the graduate program and the research interests of the faculty. This sequence is required of all the students in the cognitive and behavioral neurosciences program.

Fall, 3 credits, ABCF grading

PSY 562 Cognitive and Behavioral Neuroscience II

Students discuss topics in cognitive and behavioral neurosciences, selected on the basis of the needs of the graduate program and the research interests of the faculty. This sequence is required of all the students in the cognitive and behavioral neurosciences program.

Spring, 3 credits, ABCF grading

PSY 563 Neuropsychological Assessment

Classroom discussions of issues in neuropsychological assessment and design of assessment batteries are combined with

practical experience in the assessment of clinical populations. Each student is assigned to a supervisor to learn assessment techniques for research and/or clinical practice.

Fall or spring, alternate years, 3 credits, ABCF grading

PSY 566 Laboratory Rotations in Cognitive and Behavioral Neuroscience I, II

This is a two-semester sequence devoted to instruction in a variety of laboratory techniques. Students spend a minimum of four weeks in each of three different laboratories of faculty in the program.

Section I, fall; Section II, spring, 3 credits, S/U grading

May be repeated twice for credit

PSY 581 Cognitive and Behavioral Neuroscience Colloquium I

Colloquium presentations on current research problems by advanced students, staff, and visiting scientists. This sequence is required of all students in the cognitive and behavioral neuroscience program.

Fall, 0-3 credits, S/U grading

May be repeated for credit

PSY 582 Cognitive and Behavioral Neuroscience Colloquium II

Colloquium presentations on current research problems by advanced students, staff, and visiting scientists. This sequence is required of all students in the cognitive and behavioral neuroscience program.

Spring, 0-3 credits, S/U grading

May be repeated for credit

PSY 583 Experimental Psychology Colloquium

Seminars on current research problems directed by students, staff, and invited scientists. Required of all experimental students.

Fall, 0-3 credits, S/U grading

PSY 584 Experimental Psychology Colloquium

Seminars on current research problems directed by students, staff, and invited scientists. Required of all experimental students.

Spring, 0-3 credits, ABCF grading

PSY 594 Psychology of Gender

This class examines how gender affects and is affected by behavior, thoughts, and emotions. We investigate gender differences and similarities across the lifespan and consider various perspectives on the study of gender, including psychobiology, social cognitive theory, social role theory, and cross-cultural research.

Fall or spring, alternate years, 3 credits, ABCF grading

PSY 596 Deviant Development

A critical review of contemporary research on factors that contribute to the development of deviations from the norm for cognitive, affective, and behavioral functions in infants, children, and adolescents. Antecedent conditions to be considered are genetic, constitutional, nutritional, pharmacological, and societal factors, as well as those dealing with the influence of parents, peers, and school.

Fall or spring, alternate years, 3 credits, ABCF grading

PSY 601 Orientation to Clinical Psychology

An introduction to the field of clinical psychology and to the course, research, and, practicum requirements of the clinical doctoral program. Required of all clinical graduate students during their first year.

Fall, S/U grading

PSY 602 Assessment Practicum

Exposure to the application of clinical assessment procedures.

Prerequisite: Corequisite: PSY 534

Fall and spring, 1 credit, S/U grading

PSY 603 Ethics and Professional Issues

Ethics and professional issues. Required of all first-year clinical students.

Spring, 1 credit, S/U grading

PSY 604 Intervention Practicum

Exposure to the application of clinical intervention procedures.

Prerequisite: PSY 537 or PSY 538

Fall, 1 credit, S/U grading

PSY 605 Advanced Clinical Practicum

Exposure to the application of advanced intervention procedures.

Fall and spring, 1 credit, S/U grading

PSY 606 Supervised Practice

Supervised experience for advanced clinical students.

Fall and spring, 0-1 credits, S/U grading

PSY 608 Clinical Psychology Internship

Qualified clinical students carry out supervised clinical responsibilities in settings approved by the faculty.

Fall and spring, 1 credit, S/U grading

PSY 610 Seminars in Selected Topics

Topics selected on the basis of the needs of the graduate program and research interests of the staff.

Prerequisite: Permission of instructor

Fall and spring, 0-3 credits, ABCF grading

May be repeated for credit

PSY 620 Seminars in Selected Topics

Topics selected on the basis of the needs of the graduate program and research interests of the staff.

Prerequisite: Permission of instructor

Fall and spring, 0-3 credits, ABCF grading

May be repeated for credit

PSY 621 Seminar in Teaching Methods

Theory and pragmatics of good college teaching. Topics include lecturing, use of discussion, types of evaluation of students and teachers, factors affecting undergraduate learning, ethics, student-faculty relations, course administration, and audio-visual devices.

Prerequisites: Matriculated psychology

graduate student; permission of instructor

Fall or spring, 0-3 credits, ABCF grading

May be repeated for credit

PSY 696 Readings

Prerequisite: Permission of instructor

1-12 credits, S/U grading

May be repeated for credit

PSY 698 Research

Prerequisite: Permission of instructor

1-12 credits, S/U grading

May be repeated for credit

PSY 699 Dissertation Research on Campus

Dissertation research under direction of advisor.

Prerequisite: Advancement to candidacy

(G5); major portion of research must take

place on SBU campus, at Cold Spring

Harbor, or at Brookhaven National Lab

Fall, spring, and summer, 1-12 credits, S/U

grading

May be repeated for credit

PSY 700 Dissertation Research off Campus—Domestic

Prerequisite: Must be advanced to candidacy

(G5); major portion of research will take

place off campus, but in the U.S. and/or U.S.

provinces (Brookhaven National Lab and

Cold Spring Harbor Lab are considered on

campus); all international students must

enroll in one of the graduate student insur-

ance plans and should be advised by an

International Advisor

Fall, spring, and summer, 1-9 credits,

S/U grading

May be repeated for credit

PSY 701 Dissertation Research off Campus—International

Prerequisite: Must be advanced to candidacy

(G5); major portion of research will take

place outside of the U.S. and/or U.S.

provinces; domestic students have the option

of the health plan and may also enroll in

MEDEX; international students who are in

their home country are not covered by the

mandatory health plan and must contact the

Insurance Office for the insurance charge to

be removed; international students who are

not in their home country are charged for the

mandatory health insurance (if they are to

be covered by another insurance plan, they

must file a waiver by the second week of

classes; the charge will only be removed if

the other plan is deemed comparable); all

international students must receive clear-

ance from an international advisor

Fall, spring, and summer, 1-9 credits, S/U

grading

May be repeated for credit

PSY 800 Full-Time Summer Research

May be repeated for credit

PSY 810 Summer Research

PSY 820 Summer Teaching-CED

Public Health

Graduate Program Director: Raymond L. Goldsteen

Graduate Program Coordinator: Judith Greene

Degrees awarded: Master of Public Health (MPH)

The Graduate Program in Public Health is a small, selective program that awards a Master of Public Health (MPH) degree. The mission of the program is to train individuals who wish to integrate public health knowledge, skills, and values into their careers and provide leadership in the field.

The program emphasizes the population health approach to public health. Achieving and maintaining healthy populations, effectively and efficiently, are central to the population health orientation. Effectiveness and efficiency are particularly acute concerns for public health in today's world of limited resources and competing agendas. The hallmarks of population health are an ecological understanding of the determinants of health and a systems approach to solving health problems; emphasis on proactively stabilizing and improving health among all populations; and insistence on accountability, evidence-based practice, and continuous performance improvement. The population health approach requires multidisciplinary collaboration among scholars in the social, behavioral, clinical, and basic sciences and the humanities; development of comprehensive, sophisticated health information systems; and use of advanced analytical tools to examine health problems and evaluate responses to them.

The program is designed for persons with an advanced clinical or related degree or currently studying for such a degree, as well as for students who have only a bachelor's degree. The curriculum is 45 credits and consists of a public health core (24 credits), a practicum, a capstone seminar, and a concentration in Evaluative Sciences, Community Health, or the Public Health Generalist. The core consists of ten required courses including biostatistics, epidemiology, environmental and occupational health, data management and informatics, public health ethics and law, health systems, cost benefit analysis, and the social and behavioral determinants of health. The practicum is a field-based experience that introduces students to

the real world of public health practice. Most courses are offered in the late afternoon and evening, and there are course offerings throughout the year.

The Master of Public Health degree can be obtained concurrently with the MD degree. Medical students are advised to begin their coursework for the MPH degree in the summer preceding medical school in order to complete the program within four years. During the academic year, tuition for the MPH program is waived for full-time medical students. During the summer, medical students must pay tuition for MPH courses. There may be scholarships and loans available for summer study.

Facilities

The Graduate Program in Public Health has established the Center for Health Services and Outcomes Research (CHSOR). The Center is a multidisciplinary research unit that combines expertise in economics, statistics, epidemiology, medicine, and other clinical disciplines to address substantive issues in health care service and delivery. As part of its research mission, the Center seeks to develop joint projects with researchers at Stony Brook University and with health organizations throughout Long Island.

The Health Sciences Library serves the educational, clinical, and research needs of the faculty, staff, and students in the program, the Medical Center, and the University. It also functions as a regional resource, assisting health care professionals throughout Nassau and Suffolk counties. It contains a large, well-equipped computer laboratory for students.

Admission

Although admissions requirements are rigorous, the Graduate Program in Public Health aims to develop camaraderie, cooperation, and cohesiveness among students in each cohort. For this reason, admission to the program is during the fall semester only.

The admissions requirements for the program are:

A. Bachelor's degree from an accredited college or university with a 3.0 GPA or better; the major must have an equivalent at the State University of New York (SUNY);

B. Official transcripts from all post-secondary schools; transcripts for all degrees earned in schools outside the U.S. or Canada must be evaluated by an agency accredited by the National Association of Credential Evaluation Services; the requirement for evaluation of transcripts is waived for graduates of foreign medical schools with a current license to practice in the U.S.;

C. Proof of licensure and good standing for licensed health professionals;

D. Official GRE (verbal, quantitative, and analytical) scores; applicants can submit scores from the MCAT, DAT, or GMAT instead of the GRE; this requirement is waived for applicants who have been awarded a doctoral degree from an accredited U.S. or Canadian college or university; persons currently employed for more than three years in the public health field may request a waiver of this requirement;

E. Three references from persons who can address the applicant's capacity to provide leadership in public health and complete a course of graduate study; if the applicant is a student or has graduated within the last two years, at least one letter must be from a college or university faculty member with whom the applicant has studied; if the applicant is a member of the public health workforce, at least one letter must be from a senior administrator in the organization who is familiar with his/her work;

F. Two essays, no more than 500 words each:

Essay 1: How do your background, training, and experience prepare you for a leadership role in Public Health?

Essay 2: Select one of the following topics: (a) Explain how the Graduate Program in Public Health and the

concentration chosen will help you achieve your short-term and long-term goals; (b) Define a time in your own life when you have identified and captured an opportunity; (c) Define a unique quality you possess; or (d) How do you expect to contribute to the improvement of health in your community?

G. A personal interview, if requested by the Admissions Committee.

H. Any other requirements of the Graduate School not stated here.

The Admissions Committee considers all factors including grades, GRE scores, recommendation letters, essays, prior training, and professional experience. It is a goal of the Admissions Committee to select applicants who have the academic capability, aptitude, character, personal qualities, and commitment to provide future value to society through leadership and creative contributions to the field of public health.

In addition, the program requires satisfactory completion of one of the following: a basic undergraduate or graduate course in statistics; an undergraduate calculus course; or an undergraduate algebra course. Also, students without a clinical background are required to demonstrate basic knowledge about the biomedical foundations of health and illness. Students without prior coursework in this area must complete an approved course in the biomedical foundations of health. The biomedical courses link on the Graduate Program in Public Health Web site provides a list of courses that meet this criterion. Students are admitted to the program on the condition that this course will be completed by the end of the first semester.

There are special admission requirements for international students.

Faculty

Professors

Goldstein, Raymond L., *Graduate Program Director*. Dr.P.H., Columbia University: Fairness and effectiveness of allocation policies for healthcare resources.

Rizzo, John A., Ph.D., Brown University: Health economics; clinical outcomes research.

Saad, Mohammed, M.D., Diabetes research.

Research Associate Professor

Goldstein, Karen, Ph.D., University of Illinois, Urbana: Social determinants of child health and well-being.

Assistant Professors

Hale, Lauren E., Ph.D., Princeton University: Social determinants of health; demography.

Meng, Hongdao, Ph.D., University of Rochester: Health services research.

Clinical Assistant Professor

Sepulveda, Hector, M.D., Stony Brook University; M.P.H., Columbia University: Community development and outreach.

Affiliated Faculty

Professors

Bromet, Evelyn J., *Psychiatry and Preventive Medicine*. Ph.D., Yale University: Psychiatric epidemiology; disaster research; longitudinal studies of high risk groups.

Coulehan, John L., *Preventive Medicine*. M.D., University of Pittsburgh: End-of-life care.

Ferguson, David L., *Technology and Society*. Ph.D., University of California, Berkeley: Quantitative reasoning; problem solving; educational technologies; decision-making.

Jonas, Steven, *Preventive Medicine*. M.D., Harvard University: Health policy.

Nachman, Sharon A., *Pediatrics*. M.D., Stony Brook University: Pediatric infectious diseases.

Robbins, Charles L., *Social Welfare*. D.S.W., Yeshiva University: Health, violence, and ethics; social justice; gender issues.

Sanderson, Warren C., *Economics*. Ph.D., Stanford University: Economic history; demography.

Tomes, Nancy J., *History*. Ph.D., University of Pennsylvania: History of medicine and public health.

Associate Professors

Berger, Candyce, *Social Welfare*. Ph.D., University of California, Los Angeles: Child and maternal health.

McCrary, S. Van, *Preventive Medicine*. Ph.D., University of Texas Medical Branch; M.P.H., Johns Hopkins University; J.D., University of Tennessee: Bioethics and health law.

O'Riordan, Thomas, *Medicine*. M.D., University College, Dublin: Asthma, COPD, and other respiratory system diseases.

Clinical Associate Professors

Benz Scott, Lisa A., *Health Care Policy and Management*. Ph.D., Johns Hopkins University: Cardiovascular outcomes research.

Rice, Nanci, *Health Care, Policy, and Management*. Ph.D., New York University: Women's health.

Assistant Professors

Belling, Catherine, *Preventive Medicine*. Ph.D., Stony Brook University: Medical humanities; literature and medicine; cultural issues.

Chen, John, *Preventive Medicine*. Ph.D., University of California, Berkeley: Genetic diseases, genetic-environmental interaction; longitudinal data analysis and other applied statistical problems.

Dwyer, Debra S., *Economics*. Ph.D., Cornell University: Health economics.

Francis, Linda E., *Social Welfare*. Ph.D., University of Indiana: Mental health; health services research; qualitative methods; stress and emotion.

Clinical Assistant Professors

Coane, Jeannette O., *Nursing*. R.N., M.A., Teacher's College, Columbia University: Clinical practice in end-of-life care; hospice and palliative care nursing.

Darowalla, Feroza, *Medicine*. M.D., State University of New York at Syracuse: Work-related lung diseases and asthma.

Francis, Linda E., *Social Welfare*. Ph.D., University of Indiana: Mental health; health services research; qualitative methods; stress and emotion.

O'Leary, Erin S., *Preventive Medicine*. Ph.D., State University of New York at Buffalo: Cancer epidemiology and environmental exposures.

Adjunct Professors

Harper, Brian, M.D., M.P.H., Director, Suffolk County Department of Health Services.

Graham, David G., M.D., M.P.H., Chief Deputy Commissioner, Suffolk County Department of Health Services.

Zaki, Mahfouz, M.D., Suffolk County Department of Health Services.

Curriculum Overview

MPH Core (22 credits)

HPH 500 Contemporary Issues in Public Health (2 credits)

HPH 502 Principles of Biostatistics for Public Health (3 credits)

or

HPH 511 Biostatistics for Public Health (3 credits)

HPH 508 Health Systems Performance (3 credits)

HPH 514 Epidemiology for Public Health (3 credits)

HPH 516 Environmental and Occupational Health (3 credits)

HPH 523 Social and Behavioral Determinants of Health (2 credits)

HPH 543 Public Health Ethics and Law (2 credits)

HPH 562 Data Management and Informatics (2 credits)

HPH 563 Cost Benefit and Cost Effectiveness Analysis (2 credits)

MPH Selective (2 credits)

Select one course from the Public

Health Generalist Concentration. Each course may not be offered every year. Some courses are 3 credits, which will increase the program credit hours to from 45 to 46.

MPH Culminating Experience (6 credits)

HPH 580 Practicum (3 credits)

HPH 581 Capstone Seminar:

Population Health Issues (3 credits)

MPH Concentration (15 credits)

Total Credit Hours for MPH Program (45 credits)

Concentrations

Evaluative Sciences Concentration

To a greater and greater extent, the health care field has been challenged to prevent disease and disability, rather than focusing mainly on their treatment. Meeting these challenges requires benchmarking the current state of health in populations and continual evaluation of progress toward achieving health goals. The concentration in Evaluative Sciences will play a critical role in meeting these challenges by providing public health professionals with the analytical and statistical skills necessary to benchmark and evaluate health improvement initiatives in community and health care settings. The concentration includes courses in advanced biostatistics and epidemiology, survey research methods, clinical outcomes research, and health services research. There is a special emphasis on integrating cost effectiveness and cost benefit concepts into the curriculum so that resource allocation issues are considered.

The faculty has training in research design, implementation of research projects, and analysis of data as well as expertise in evaluating the performance of specific areas of the health care system. Faculty members study a variety of health issues including health care quality improvement, patient decision-making, and determinants of health and disease. Some work with physicians to improve clinical outcomes for patients with heart disease, cancer, asthma, and other conditions. Others work with health care administrators to increase efficiency in the use of health care resources in hospitals and other medical care settings. Some work with basic and clinical scientists—such as geneticists, environmental scientists, molecular biologists, and social scientists—to develop

our understanding of how to prevent disease and disability.

(Courses from Department of Preventive Medicine, Division of Evaluative Sciences, or Department of Economics)

Required Courses

HPH 510 Advanced Epidemiology (3 credits)

HPH 560 Advanced Biostatistics (3 credits)

HPH 565 Health Services Research Applications (3 credits)

HPH 567 Clinical Outcomes Research (2 credits)

Selectives (select two; each course may not be offered every year)

HPH 513 Decision Analysis (2 credits)

HPH 517 Continuous Quality Improvement Methods (2 credits)

HPH 528 Survey Research Methods (2 credits)

HPH 566 Clinical Trials (2 credits)

HPH 570 Multilevel and Longitudinal Analyses (2 credits)

HPH 519 Independent Study (variable credits)

HPH 646 Continuous Quality Improvement in Healthcare (3 credits)

HPH 657 Demographic Economics I (0-3 credits)

HPH 664 Economics of Health (3 credits)

HPH 665 Health Economics (3 credits)

Or, with approval of advisor, other research methods courses in the University may be substituted.

Community Health Concentration

The Community Health Concentration prepares students for community-based work in public health. The curriculum includes courses on the theories of health behavior and health communication, as well as planning, implementing, and evaluating health programs.

(Courses from the Department of Health Care Policy and Management, School of Health Technology and Management)

Students in this concentration must use their Core Selective toward the concentration.

Required Courses

HAS 500 Current Topics in Community Health (3 credits)

HAS 527 Principles and Practices of Community Health (3 credits)

HAS 533 Communications and Group Dynamics (3 credits)

HAS 557 Planning and Implementing Community Health Programs (3 credits)

HAS 559 Health Behavior and Risk Reduction (3 credits)

HAS 560 Evaluation of Community Health Programs (3 credits)

Or, with approval of advisor, other community health-related courses in the University may be substituted.

Public Health Generalist Concentration

Students in this concentration are required to take the History of Public Health and Medicine, Planning and Implementing Health Programs, Issues in Public Health Organizations, and Management Accounting and Financial Decision Analysis (9 credits total). The remaining 6 credits are selected from the following list of courses. Working with one of the Public Health Generalist advisors, students select courses that are related to their professional goals.

Required Courses

HPH 524 Planning and Implementing Health Programs (2 credits)

HPH 526 Issues in Public Health Organizations (2 credits)

(Course from Department of History)

HPH 530 History of Public Health and Medicine (2 credits)

(Course from Department of Technology and Society)

HPH 660 Management Accounting and Financial Decision Analysis (3 credits)

Selectives (select 6 credits from courses below; each course may not be offered every year)

(Courses from Department of Preventive Medicine, Division of Evaluative Sciences)

HPH 504 Surveillance and Control of Infectious Diseases (2 credits)

HPH 505 Topics in Population Health (.5-3 credits)

- HPH 510 Advanced Epidemiology (3 credits)
- HPH 513 Decision Analysis (2 credits)
- HPH 517 Continuous Quality Improvement Methods (2 credits)
- HPH 519 Independent Study (variable credits)
- HPH 542 Introduction to Global Health (2 credits)
- HPH 560 Advanced Biostatistics (3 credits)
- HPH 528 Survey Research Methods (2 credits)
- HPH 565 Health Services Research Applications (2 credits)
- HPH 566 Clinical Trials (2 credits)
- HPH 567 Clinical Outcomes Research (2 credits)
- HPH 568 Overview of Molecular Medicine and Genomics (2 credits)
- (Courses from Department of Preventive Medicine, Division of Environmental/Occupational Health)*
- HPH 644 Epidemiology of Environmental and Occupational Disorders (3 credits)
- HPH 645 Occupational Health Principles (3 credits)
- HPH 647 Environmental Toxicology (3 credits)
- HPH 648 Industrial Hygiene (3 credits)
- HPH 649 Health Physics (3 credits)
- HPH 650 Safety Engineering and Management (3 credits)
- HPH 651 Environmental and Occupational Health Laws and Agencies (3 credits)
- HPH 652 Occupational Safety and Health for Special Groups (3 credits)
- (Course from Department of Molecular Genetics and Microbiology)*
- HPH 659 Biology of Cancer (1 credit)
- (Courses from School of Social Welfare)*
- HPH 620 Parameters of Social and Health Policy I (3 credits)
- HPH 621 Parameters of Social and Health Policy II (3 credits)
- HPH 624 Youth and Violence (2 credits)
- HPH 625 Children of Chaos: The Social Worker's Role (2 credits)
- HPH 626 Overview of Substance Abuse (2 credits)
- HPH 630 Chemical Dependency in Special Populations (2 credits)
- HPH 631 Cultural Competence: An Ingredient Enhancing Treatment Outcomes (2 credits)
- HPH 632 Psychopathology and Psychopharmacology (2 credits)
- HPH 633 Childhood Sexual Abuse and Long-Term Sequelae (2 credits)
- HPH 634 Program Evaluation (3 credits)
- HPH 635 Seminar on Family Violence (2 credits)
- HPH 636 Community Analysis and Health Promotion (2 credits)
- HPH 638 Qualitative Health Research Methods (3 credits)
- (Course from Department of Anthropology)*
- HPH 658 Use of Remote Sensing and GIS in Environmental Analysis (3 credits)
- (Courses from Department of Economics)*
- HPH 657 Demographic Economics I (0-3 credits)
- HPH 664 Economics of Health (3 credits)
- HPH 665 Health Economics (3 credits)
- (Courses from Marine Sciences Research Center or Department of Technology and Society)*
- HPH 653 Introduction to Homeland Security (3 credits)
- HPH 654 Nuclear Safeguards and Security (4 credits)
- HPH 655 Chemical and Biological Weapons: Safeguards and Security (4 credits)
- HPH 656 Risk Assessment, Regulation, and Homeland Security (4 credits)
- HPH 661 Methods of Socio-Technological Decision-Making (3 credits)
- HPH 662 Systems Approach to Human-Machine Systems (3 credits)
- HPH 663 Waste Management: Systems and Principles (3 credits)
- HPH 671 Marine Pollution (3 credits)
- HPH 672 Marine Management (3 credits)
- HPH 673 Groundwater Problems (3 credits)
- HPH 675 Environment and Public Health (3 credits)
- HPH 676 Environmental Law and Regulation (3 credits)
- HPH 683 Air Pollution and Air Quality Management (3 credits)
- HPH 684 Environmental and Waste Management in Business and Industry (3 credits)
- HPH 686 Risk Assessment and Hazard Management (3 credits)
- HPH 687 Diagnosis of Environmental Disputes (3 credits)
- HPH 688 Principles of Environmental Systems Analysis (3 credits)
- HPH 689 Simulation Models for Environmental and Waste Management (3 credits)

Or, with approval of academic advisor, other courses in the University related to the student's goals may be substituted.

Courses

Core Courses

HPH 500 Contemporary Issues

Public Health: The Long Island and Global Experiences

This course will mainly examine the role of medicine and public health in improving the health of the Suffolk County population. Students will be exposed to Field Preventive Medicine as performed by public health practitioners including investigations of infectious disease outbreaks and cancer clusters. As one of the most heavily mosquito and tick infested counties in the country, will emphasize arthropod-borne diseases. The impact of drinking water standards and frequently encountered contaminants such as synthetic organic compounds and pesticides will be studied. Sanitary regulations and public health law will be discussed, as will bioterrorism and the modes most threatening to residents of Long Island. Global issues will include infectious diseases and food-borne illnesses that affect morbidity and mortality worldwide.

2-3 credits, ABCF grading

HPH 502 Principles of Biostatistics for Public Health

This course provides an introduction to the study of statistics with specific applications to the field of public health. It introduces students to basic statistical concepts and emphasizes the skills needed to summarize data, interpret findings, and critically evaluate the public health literature. Concepts taught in this course include, but are not limited to, the following: summarizing data, drawing inferences, estimation, chi-squared statistics, parametric and nonparametric correlation, and linear and nonlinear regression. This course is not a prerequisite for HPH 560 or HPH 510.

Prerequisite: Admission to graduate Health Sciences Center program
3 credits

HPH 508 Health Systems Performance

This course introduces students to the system that we have developed to deliver health care in the United States, with international comparisons. The topics include the organization and financing of health care systems, access to health care including health insurance, regulation and policy issues, and the health care workforce

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HPH 511 Biostatistics for Public Health

This course is intended to provide students and researchers in public health with an introduction to the principles of statistical methods and their application in biomedical and public health research. This course includes introductions to the use of computers for statistical analysis, summarizing and exploring data, probability theory, discrete and continuous probability distributions, populations and samples, sampling distributions and statistical inference, hypothesis testing, sample size and power, two-sample comparisons, analysis of variance, association and correlation, simple linear regression, and simple logistic regression.

Prerequisite: High school algebra
3 credits, ABCF grading

HPH 514 Epidemiology for Public Health

This course presents basic epidemiologic concepts used to study health and disease in populations. It provides an overview of the major causes of morbidity and mortality, including methods of measurement (e.g., incidence, prevalence). Observational and experimental epidemiologic studies will be described and their advantages and disadvantages compared. The course aims for students to begin developing the skills needed to evaluate data, interpret reports, and design and conduct studies. Students will be introduced to the various areas of epidemiologic study—cancer, molecular/genetic, environmental, occupational, social and behavioral, and infectious disease/surveillance. The course comprises both lectures and small group seminars for in-depth discussions of previously assigned topics.

3 credits, ABCF grading

HPH 516 Environmental and Occupational Health

This course is designed to provide the fundamentals of environmental and occupational health and to educate students on issues related to major environmental and occupational concerns. It will provide a forum for the discussion of local and national environmental and occupational public health issues. The content of the course will focus on major pollutants, their detection, impact on health, and principles of remediation. Using various teaching techniques, students will be exposed to current environmental and occupational topics and approaches to prevention and treatment. The course will emphasize the most recent research in the field.

3 credits, ABCF grading

HPH 523 Social and Behavioral Determinants of Health

This course introduces students to population health as one of the organizing concepts in public health and the orientation that differentiates public health from medicine. Consistent with public health tradition, health is discussed from an ecological perspective, and the course presents current knowledge about the multiple determinants of population health including socioeconomic status, the physical environment, medical care, individual behavior, and genetics and the interaction of these factors. Also covered is the measurement of population health, sources of data about population health, and methods for assessing population health improvements.

2 credits, ABCF grading

HPH 543 Public Health Ethics and Law

This course will deal with the role of law in public health, the history of law concerning public health, the basic legal knowledge for public health, legal basis for public health powers, the administrative law system, public health law as it relates to individual rights, control of property, substance abuse, the AIDS epidemic, laws/regulations governing public health safety; workers' compensation law related to health; environmental laws/regulations and food, drug, device, and cosmetic laws/regulations. Additionally, the individual rights and ethics of modern general public health practice in the 21st century will be discussed. Topics such as genomics, HIPAA, bioterrorism, emergent infectious diseases, public health research, and issues regarding public health accountability will be explored.

2 credits, ABCF grading

HPH 562 Data Management and Informatics

This course provides instruction in the use of software to prepare data for statistical analysis. The focus is on database management and programming problems.

1-2 credits, ABCF grading

HPH 563 Cost Benefit and Cost Effectiveness Analysis

The course will introduce the uses and conduct of cost benefit and cost effectiveness analyses as decision-making aids in the health care research. It will provide students with an understanding of the roles and limitations of cost benefit and cost effectiveness analyses and criteria for evaluating those studies. Critical

issues regarding measuring cost and effectiveness, evaluating outcomes, discounting, and dealing with uncertainty will be discussed.

2 credits, ABCF grading

Culminating Experience Courses

HPH 580 Practicum

The Practicum is a planned experience in a supervised and evaluated public health-related practice setting. A journal of fieldwork and a project, with a written report, are required. Students will be expected to demonstrate their "capacity to organize, analyze, interpret and communicate knowledge in an applied manner." Health departments, as well as a variety of other local organizations, offer a wide array of potential sites for the Practicum experience.

2-3 credits, S/F graded

HPH 581 Capstone Seminar: Population Health Issues

This course has two parts: (1) the first hour will be used to evaluate student competence in basic public health knowledge through student presentations based on Practicum and seminar projects. The seminar will also be a forum to discuss issues and problems that arise during the Practicum experience; (2) during the second and third hours, experts will present on the major infectious and chronic diseases that affect national and global populations, using examples that will apply previous core learning in epidemiology, biostatistics, health systems and policy, behavioral and social determinants of health, and cost benefit and effectiveness analysis. Most core and concentration course work must be complete before the student can participate in the Capstone Seminar.

2-3 credits, ABCF grading

Evaluative Sciences Concentration (Required Courses)

HPH 510 Advanced Epidemiology

This course will introduce advanced statistical methods for epidemiological investigations for infectious and non-infectious diseases. The topics include interaction, standardization of rates and ratios, conditional logistic regression, life tables, and survival analysis.

Prerequisites: HPH 514 and HPH 511 or other mathematically oriented introduction to statistics; admission to graduate Health Sciences Center program
3 credits, ABCF grading

HPH 560 Advanced Biostatistics

This course will discuss aspects of practice and statistical theory relevant to the design of scientific investigations in the health sciences. Topics will include sample size considerations, basic principles of experimental design, block designs, and factorial experiments, and multivariate analysis for continuous and categorical data.

3 credits, ABCF grading

HPH 565 Health Services Research Applications

The course is designed to introduce students to the application of standard methods in

health services research. The student will learn the principles, methods, and terminology specific to this field. Threats to validity, information bias and the methods of control will be explored. Lectures will include risk adjustment, benchmarking, outcomes and effectiveness research. This course will emphasize the theory of sampling and survey methods and their application to health service research. *2-3 credits, ABCF grading*

HPH 567 Clinical Outcomes Research

This course will: (1) introduce the basic concepts, methods, and topics in clinical outcomes research; and (2) introduce the skills necessary to perform risk factor and survival analysis and to evaluate the effectiveness of medical treatments and technologies. The specific topics to be covered include: outcomes measurement; risk analyses; introduction to logistic regression and ordinary least squares estimation; issues in multivariate modeling; and survival analysis. Statistical issues will be addressed at an intuitive level, and hands-on applications will be emphasized, including computer labs in which students work directly with data to investigate issues considered in class.

2 credits, ABCF grading

Community Health Concentration (Required Courses)

HAS 527 Principles and Practice of Public and Community Health

Provides an overview of the public health system, the philosophy and purpose of public and community health, the managerial and educational aspects of public health programs, how the public health sector responds to disease prevention, environmental issues, community public health provisions and other core public and community health components. The impact of federal health care reform on the public health delivery system and the economic and fiscal implications of the system on state and local governments will be discussed. Students will analyze the critical elements of a health care system.

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HAS 533 Communication and Group Dynamics

Assists students in understanding and improving interpersonal communication skills through structured exercises in speaking, writing and interacting. Emphasizes leadership skills in group interactions especially in the health care fields.

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HAS 557 Planning and Implementing Community Health Programs

Prepares students to conduct needs assessments of various diverse populations and to plan, implement and evaluate programs to meet the needs. Plans include detailed goals, behavioral objectives, methods, resource and budget allocation, including grant and contract considerations.

Prerequisite: Admission to graduate Health

Sciences Center program
3 credits, ABCF grading

HAS 559 Health Behavior and Risk Reduction

Discusses the impact of behavior on the health and well-being of the public. Addresses the leading causes of death and disability that are largely attributable to behaviors that can be modified or prevented through changes in individual, community, and institutional or organizational behavior. The course is designed to help students acquire knowledge of theories and concept to describe, explain, and predict health-related behaviors as well as behavioral responses to risk communication; and learn the skills to apply this knowledge to evaluate the effectiveness of behavioral and health communication interventions; and develop a health-related behavioral intervention project proposal that includes a plan to evaluate behavior change outcomes.

Prerequisite: Admission to graduate Health Sciences Center program
3 credits, ABCF grading

HAS 560 Evaluation of Community Health Programs

Addresses basic principles and practices of program evaluation including identifying the goals of a community health program; designing an evaluation plan that can determine if program goals are achieved; implementing an evaluation plan; interacting with stakeholders, and using the results of the program evaluation to improve performance. Students are required to design an evaluation component for the community health program they developed in HAS 557.

Prerequisite: HAS 557; admission to graduate Health Sciences Center program
3 credits, ABCF grading

Public Health Generalist Concentration (Required Courses)

HPH 524 Planning and Implementing Health Programs

This course introduces concepts and tools needed to plan and implement health programs within a public health setting. It covers evidence-based, best practices that will ensure the effectiveness and efficiency of health programs, including performance issues related to planning, developing, managing, and evaluating.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HPH 526 Issues for Public Health Organizations

Not all organizational change improves upon the past and most change is difficult. This course discusses the challenges facing public health managers who are intent on implementing organizational change. Top management processes for public health leaders will be explored including strategic planning, resource allocation, decision-making, learning, and managing.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HPH 530 History of Public Health and Medicine

This course explores major themes and interpretations in the history of public health and medicine since the 18th century. Particular emphasis is placed on the influence of social and cultural developments on medicine and public health, and vice versa. American developments will be placed in a broad comparative perspective including both Western and non-Western nations.

2 credits, ABCF grading

HPH 660 Managerial Accounting and Finance

Fundamentals of accounting with emphasis on concepts, ratio and break-even analysis, financial structure, cost analysis, replacement of assets, and cash flow management are covered.

3 credits, ABCF grading

Selective Courses

HPH 503 Research Ethics

This course presents issues in the ethical conduct of research. Topics include data collection and management, research fraud, academic misconduct, conflict of interest, federal and institutional guidelines regarding research using human and animal subjects, vulnerable populations, confidentiality, and the Institutional Review Board (IRB).

Prerequisite: Admission to graduate Health Sciences Center program
1 credit, ABCF grading

HPH 504 Surveillance and Control of Infectious Diseases

This course introduces the methods of surveillance and control of infectious diseases in the community and in health care organizations including the design, implementation, and evaluation of surveillance systems and the analysis of surveillance system data. The course focuses on infectious diseases common in the United States, but also discusses the global situation. Bioterrorism will be discussed.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HPH 505 Topics in Population Health Studies

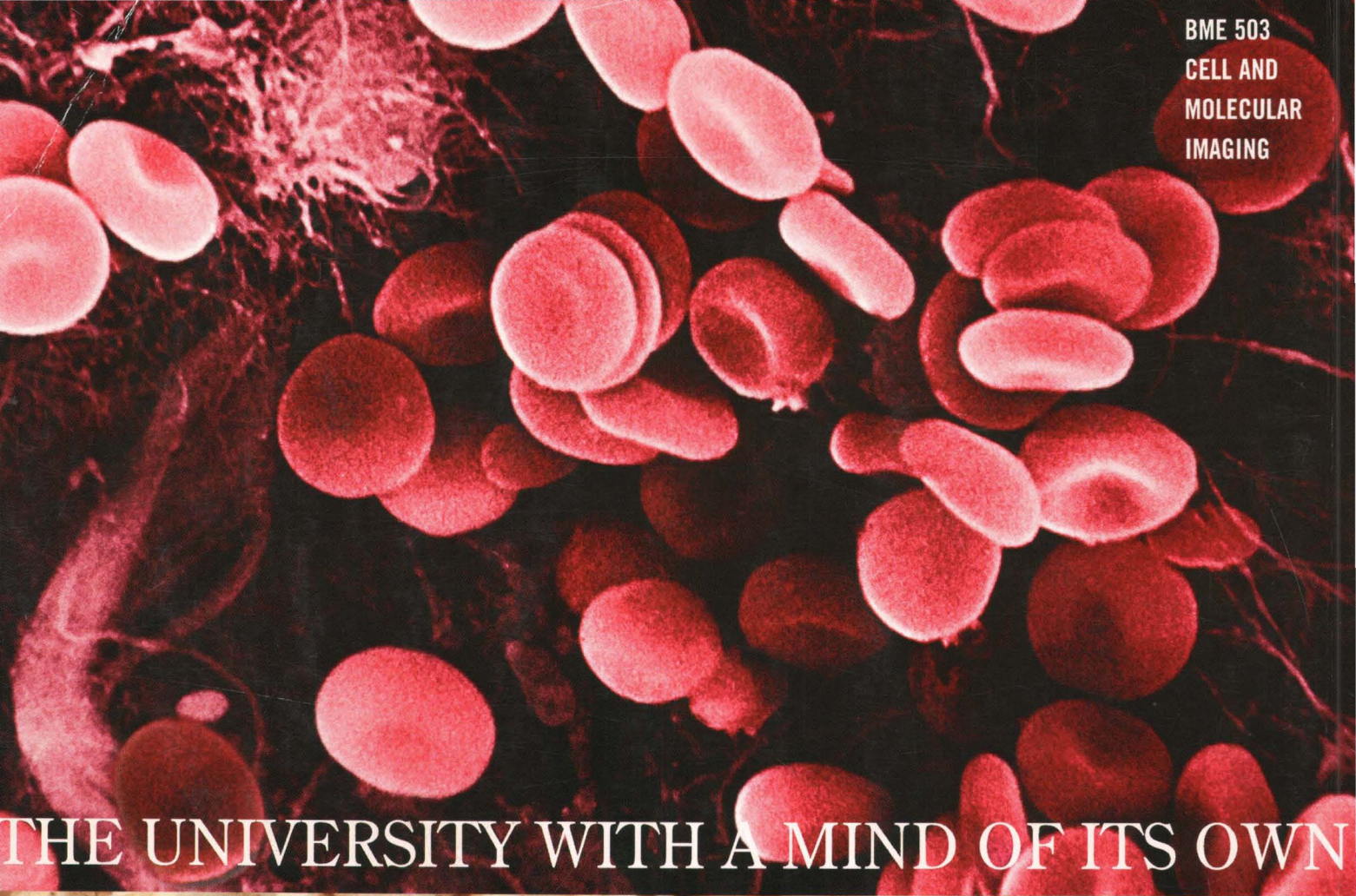
This course presents current topics and issues in population health studies.

Prerequisite: Admission to graduate Health Sciences Center program
5-12 credits, ABCF grading
May be repeated once credit

HPH 506 Methods for Population Health Studies


This course introduces population health studies methods and their importance for evidence-based public health practice. Topics include the design, implementation, and analysis of community surveys, qualitative studies, and evaluation studies for health programs. Sources and uses of existing data for population health studies, including census, mortality, administrative, and survey, will be discussed.

Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

A microscopic view of numerous red blood cells, appearing as bright red, biconcave discs against a dark background. The cells are scattered across the frame, with some showing their characteristic shape and others appearing as smaller, more rounded forms.

BME 503
CELL AND
MOLECULAR
IMAGING

THE UNIVERSITY WITH A MIND OF ITS OWN

A close-up, top-down view of a large pile of sliced mushrooms. The mushrooms are light-colored, likely white or cream, and are cut into various sizes and shapes, including halves and quarters. They are densely packed together, creating a textured, repetitive pattern of mushroom caps and stems.

HIS 571
THEME
SEMINARS IN
ENVIRONMENT,
SCIENCE, AND
HEALTH

The logo for Stony Brook State University of New York. It features the words "STONY" and "BROOK" stacked vertically. The letter "O" in "STONY" is replaced by a stylized sun or globe icon with radiating lines. The letter "O" in "BROOK" is replaced by a stylized globe icon with horizontal lines. Below the text, it says "STATE UNIVERSITY OF NEW YORK".

STONY
BROOK
STATE UNIVERSITY OF NEW YORK