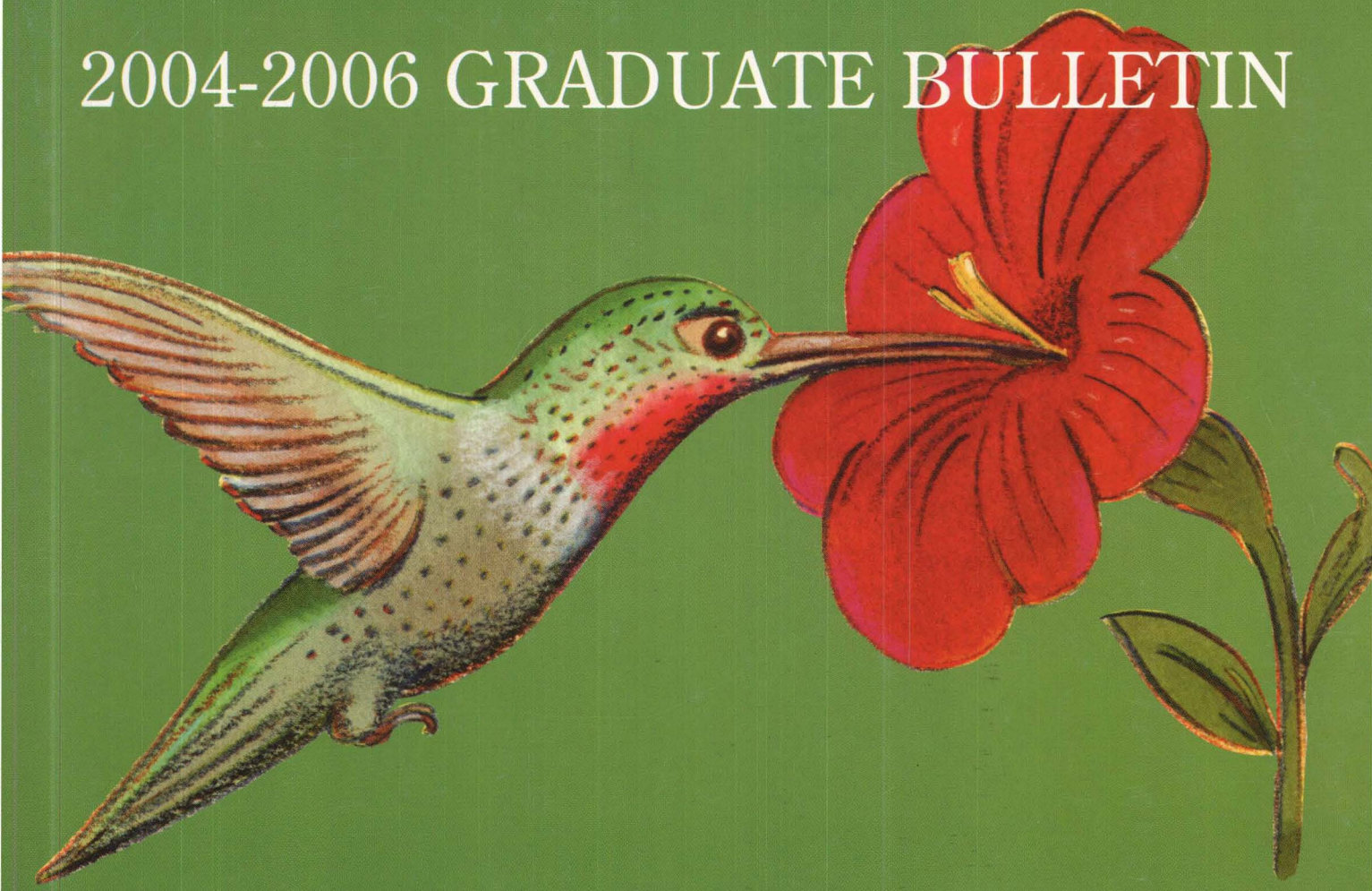
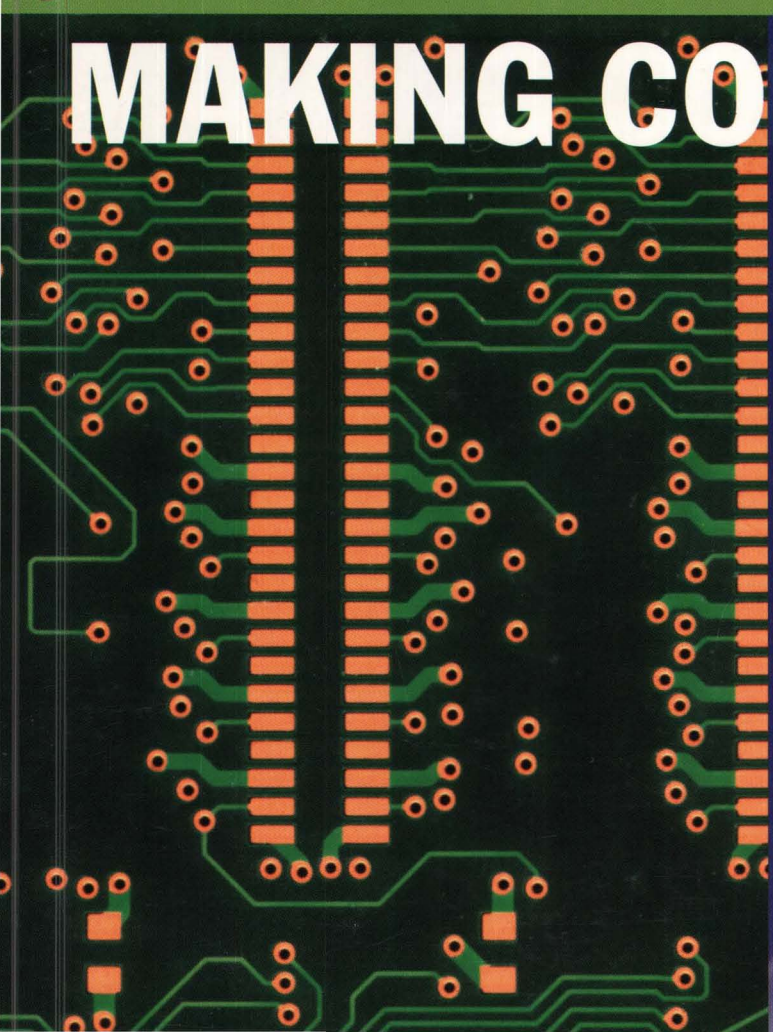
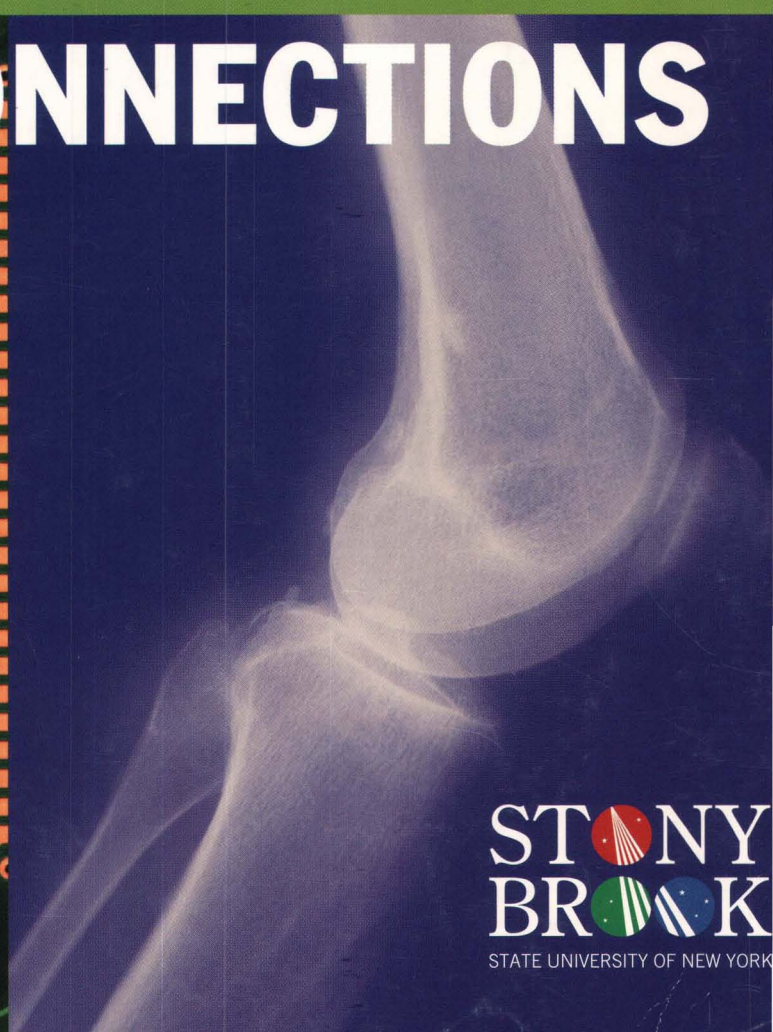
2004-2006 GRADUATE BULLETIN



MAKING CONNECTIONS





STONY BROOK
STATE UNIVERSITY OF NEW YORK

STONY BROOK

STATE UNIVERSITY OF NEW YORK

2004-2006 Graduate Bulletin

Shirley Strum Kenny, President

Many Voices, Many Visions, One University

As members of Stony Brook University, we acknowledge that the primary purpose of this community is education, including academic achievement, social development, and personal growth.

In committing ourselves to study and work at Stony Brook, we agree to promote equality, civility, caring, responsibility, accountability, and respect. We also recognize the importance of understanding and appreciating our differences and similarities.

As members of a respectful community, we will not encroach on the rights of others, either as individuals or as groups. We recognize that freedom of expression and opinion entails an obligation to listen to and understand the beliefs and opinions of others, and to treat others fairly.

We strive to be a responsible community. We are accountable individually for our personal behavior and development, and collectively for the welfare of the community itself.

We encourage all Stony Brook community members to celebrate and express pride in our community's academic, athletic, and social accomplishments, and to involve themselves in the surrounding local communities.

In affirming this statement, we commit ourselves to becoming dedicated, active, and full members of Stony Brook University in each and every role we assume.

—Year of Community Initiative

A Message from the Provost

Graduate school can be one of the most exciting and rewarding times of your professional life. It is an opportunity to learn in depth about disciplines that intrigue you, hone your skills of inquiry, and make contributions to knowledge through your own scholarly efforts. You will also form some of the professional and personal relationships that will shape your life. I hope you will consider Stony Brook as the place to do your graduate work. Stony Brook is a young and vibrant university that has quickly become recognized as one of the best in the nation. The excellent faculty and staff, the traditional College of Arts and Sciences, an extensive Health Sciences Center, the Marine Sciences Research Center, and the College of Engineering and Applied Sciences create a stimulating atmosphere across a diverse set of disciplines and many opportunities for exciting and rigorous interdisciplinary scholarship.

Your years in graduate school will also be a time to develop close relationships with faculty mentors as you learn the substance of your discipline and begin to contribute your own ideas to your areas of interest. Stony Brook encourages a diversity of intellectual interactions among students and faculty, as well as outreach to neighboring institutions and to our community. Your development into a creative scholar is a prime goal of graduate education at Stony Brook. You will find that Stony Brook has high standards for its faculty and students, and you will come to realize that this level of excellence provides a benchmark against which to judge your future achievements.

As you consider graduate schools, explore the relationships that faculty have with their students and the opportunities for interdisciplinary interactions. Stony Brook is fortunate to have two close neighboring institutions that substantially broaden the intellectual opportunities for students and faculty. Brookhaven National Laboratory to the east is an internationally known center of research in physics, biology, chemistry, and other disciplines. Cold Spring Harbor Laboratory to the west is similarly well known for its excellence in the biomedical sciences. Stony Brook shares graduate programs with these institutions, as well as a wide range of rich and informal interactions that inevitably occur when a large concentration of scholars occurs in a small geographical area.

The Long Island region is also home to growing electronics and biotechnology companies. Many of these have been started by Stony Brook faculty and maintain close ties with the University. As well, our proximity to New York City provides countless opportunities for collaborations in the arts.

Many graduate students become junior colleagues of their professors by providing instruction for undergraduates. A full and rewarding time in graduate school should include the opportunity to develop your skills as a teacher and to learn to integrate fully your scholarship and your teaching. Stony Brook recognizes the importance of helping graduate students learn to teach and the significance of their contribution to the education of our undergraduates.

Come and visit our campus and community. You may not realize how beautiful Long Island is or appreciate the many opportunities that are provided by having New York City only 60 miles away. If you do visit, I would welcome the opportunity to meet you. Whatever your educational future holds, I wish you well.

Robert McGrath

A Message from the Dean

The *Graduate Bulletin* provides important information about Stony Brook's rules, regulations, and graduate admission and degree requirements. It is intended to guide the study of students enrolled in our postbaccalaureate degree programs, but not to substitute for the advice that can be provided by the faculty. Graduate students should read and understand the introductory sections of this book and the sections about their own programs. Of course, they are expected to be familiar—and to comply—with these rules.

Departments and graduate programs provide more detailed information about their own rules and procedures, and each department has a complete compilation of Graduate School policies. Please be sure to consult all of these sources of information; your success here may depend upon it.

If you encounter problems or difficulties during your studies, deal with them promptly and completely. If you cannot find a solution, contact the Graduate School; we can usually correct any problem that is brought to us in good time.

Lawrence Martin

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Graduate Bulletin

Volume XXVIII
Press Date: Summer 2004

The information in this publication is accurate as of the press date. Courses listed in the *Graduate Bulletin* are subject to change through normal academic channels. New courses and changes in existing programs are initiated by the responsible departments or programs and approved by the appropriate curriculum committees, the appropriate academic dean, and the dean of the Graduate School. Circumstances may require that a given course be withdrawn or that alternative offerings be made. Names of instructors of courses and days and times of class sessions are given in the class schedule, available to students at registration.

All students are reminded that Stony Brook University is subject to the policies set forth by the Board of Trustees of the State University of New York. Fees and charges are set in accordance with such policies and may change in response to alterations in policy or actions of the legislature during the two-year period covered by this publication. The University reserves the right to change its policies without notice.

Additional bulletins are published and made available for undergraduate, professional development (SPD), and health sciences students.

For general information about graduate programs and/or an application, please write or phone:

The Graduate School
Stony Brook University
Stony Brook, New York 11794-4433
(631) 632-GRAD (4723)
(631) 632-7243 (fax)
www.grad.sunysb.edu

The general University telephone number is (631) 689-6000.

Equal Opportunity and Affirmative Action

Stony Brook University does not discriminate on the basis of race, religion, sex, color, national origin, age, disability, marital status, arrest record, criminal conviction, or status as a disabled or Vietnam-Era Veteran (or other protected category of eligible veteran) in its educational programs or employment. Also, the State of New York prohibits discrimination on the basis of sexual orientation.

Discrimination is unlawful. If you are a student or an employee of Stony Brook University and you consider yourself to be the victim of illegal discrimination, you may file a grievance in writing with the Office of Diversity and Affirmative Action within 90 calendar days of the alleged discriminatory act or within 90 days after the conclusion of the semester in which the alleged discriminatory act occurred.

If you choose to file a complaint within the University, you do not lose your right to file with an outside enforcement agency such as the New York State Division of Human Rights or the United States Equal Employment Opportunity Commission.

Any questions concerning this policy or allegations of noncompliance should be directed to:

Affirmative Action Officer
Administration Building 294
Stony Brook University
Stony Brook, NY 11794-0251
(631) 632-6280

For more information about this office and its many programs, please visit *www.stonybrook.edu/diversity*.

This publication can be made available in alternative format upon request.

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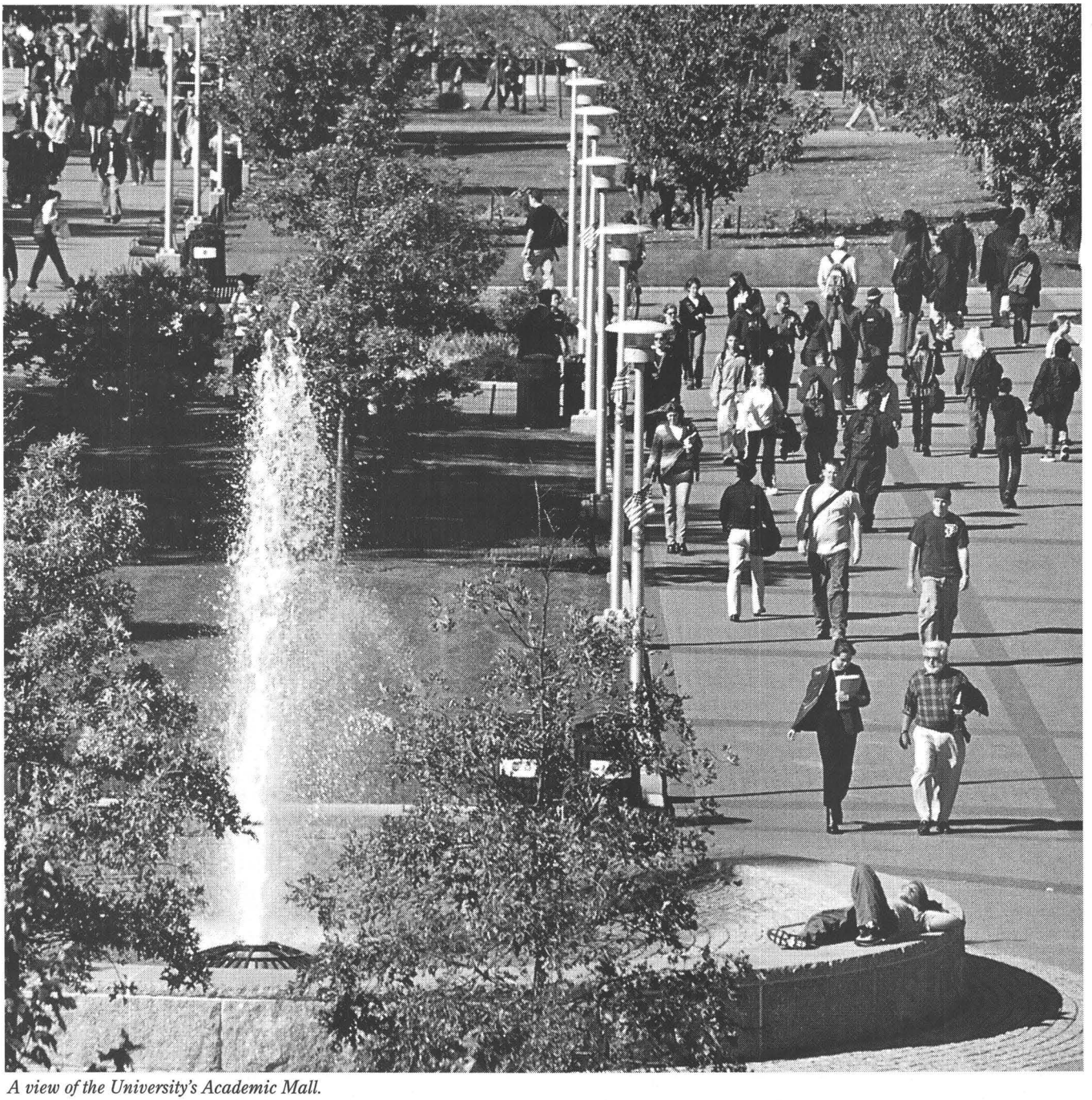
An Introduction to Stony Brook



A view of the University's Academic Mall.

Stony Brook Soars: An Overview

Located on Long Island's North Shore, Stony Brook is a 1,100-acre universe in which world-renowned faculty have created a stimulating, highly interactive environment for graduate studies. With exceptional strength in the sciences, mathematics, humanities, fine arts, social sciences, engineering, and health professions, Stony Brook offers an array of challenging, career-building graduate programs. The Graduate School was awarded the CGS/Peterson's Award for Innovation in Promoting an Inclusive Graduate Community, recognizing its commitment to promoting diversity initiatives to advance a multicultural perspective among faculty and students.

Established in 1957 as part of the State University of New York system, Stony Brook has grown at a prodigious rate and is now recognized as one of the nation's finest public universities. In 2001, the University was invited to join the Association of American Universities, the nation's most prestigious higher education association. This places Stony Brook in the company of much older, established institutions such as Harvard, Yale, Princeton, Stanford, and Johns Hopkins. Stony Brook has also been listed as one of the "100 Best Values in Higher Education" among public universities nationwide, according to *Kiplinger's Personal Finance* magazine.

Research at Stony Brook brought in more than $17 million in royalties in fiscal year 2002. Stony Brook is also one of ten universities in the country that received a National Science Foundation recognition award for integrating research and education.

Emphasis on Research

Stony Brook has been classified as a Type 1 research university, which is the highest distinction granted to fewer than two percent of all colleges and universities nationwide. Stony Brook faculty are among the top in their fields. The commitment to both research and excellence has led to many groundbreaking discoveries, such as the development of ReoPro, used in cardiac angioplasties; the cause of and a new early-diagnostic test for Lyme disease; discovery of the link between smoking and emphysema; construction of the first nuclear magnetic resonance image of a living organism; invention of an ultrasound method to speed up the healing of bone fractures; identification and cataloging of 328 distant galaxies; technologies for 3-D computer visualization; and the discovery of the link between birds and dinosaurs.

The Latin American and Caribbean Studies Center was one of nine programs in North and South America selected as sites for the Rockefeller Foundation Residential Fellowship in the Humanities program. Over four years, the program will bring eight postdoctoral fellows to the campus to address the theme "Durable Inequalities in Latin American Histories, Societies, Cultures" from a diversity of perspectives, including historical, economic, sociological, literary, and political.

Stony Brook's partnership with government and industry plays a vital role in the economy of the metropolitan region. New York State is investing $50 million in Stony Brook's planned Center of Excellence in Wireless and Information Technology. Tens of millions of dollars in anticipated federal funding will make the Center a quarter of a billion dollar effort to place New York at the forefront in the next epoch of the information revolution.

Stony Brook is the only public university with two National Science Foundation Materials, Science, and Engineering Research Centers in the fields of polymer interfaces and thermal spray high-performance coatings. The study of plastics translates to engineering careers for graduates and real-world solutions for local and national business communities.

Stony Brook co-manages Brookhaven National Laboratory in partnership with Battelle Memorial Institute, joining an elite group of universities that run federal laboratories. Located near campus, the lab affords faculty and students a unique opportunity to work among scientists from around the world. Also nearby is the world-famous Cold Spring Harbor Laboratory, where Stony Brook researchers and students collaborate with scientists from other institutions.

The University has state-of-the-art equipment, including spectroscopy labs, imaging facilities, the Van de Graaf Nuclear Accelerator, and much more. Additional research units right on campus include Stony Brook's innovative Centers for Molecular Medicine and Biology Learning Laboratories; Marine Sciences Research Center; Long Island Cancer Center; Heart Center; Institute for Theoretical Physics; High Technology Incubator; and Howard Hughes Medical Institute, among others. The Frank Melville Jr. Memorial Library, with more than 2.5 million books and 3 million publications in microformat, is one of the largest academic libraries in the nation.

Living in Stony Brook

The University is located in mid-Suffolk County, about 60 miles east of New York City—one of the most desirable places to live on the East Coast. The campus is nestled amid scenic towns and wooded areas, with the Long Island Sound just minutes away to the north, and the white sandy beaches of the Atlantic Ocean a 45-minute drive to the south. Nearby is the historic village of Stony Brook, with its breathtaking harbor views, quaint shops, and picturesque cottages. In town are the Museums at Stony Brook, the largest privately funded history and art museum on Long Island, the landmark Three Village Inn (circa 1751), and the Stony Brook Grist Mill, which dates back to 1699 and is open to the public for tours. The conveniences of the modern world are at hand as well—Stony Brook and nearby Port Jefferson, Lake Grove, and Smithtown boast every shop imaginable, from specialty to superstore. For those with children, the University has on-site daycare services and proximity to the highly regarded Three Village School District.

Stony Brook has become a leisure-time resource to Long Island residents. The Staller Center for the Arts features productions by world-class artists in a Broadway-caliber theatre; a first-run cinema utilizing Suffolk County's largest screen; an art gallery that sponsors exhibitions by faculty, students, and artists of the region; and its popular Summer Film Festival, including indie features making their premiere.

For sports and fitness enthusiasts, the University has a 5,000-seat indoor Sports Complex and a 7,500-seat outdoor athletic stadium for Stony Brook's Division I teams. The Student Activities Center houses the Wellness Center, run by the Department of Campus Recreation, which offers a variety of fitness classes and the use of state-of-the-art equipment.

Off campus, you can attend art openings in the Hamptons and view independent films at the Cinema Arts

Theater in Huntington village. The many restaurants in Port Jefferson have fresh seafood, and you can take a ferry ride across the Sound from Port Jefferson to Bridgeport, Connecticut. For a relaxing weekend drive, you can visit the wineries, orchards, and farmlands sprawled across Long Island's scenic East End.

The region is a naturalist's dream. On campus is the 26-acre Ashley Schiff Nature Preserve. To the east lie thousands of acres of pine barrens preserved from development. Long Island's hundreds of miles of coastline attract many swimming, boating, and fishing enthusiasts from around the world.

Life at Stony Brook has something for everyone. There is the tranquil pace of the surrounding community, with its winding roads and gracious homes. At the same time, there are the cutting-edge resources and the abundant culture of the University itself. And easily accessible by car or train is the excitement of Manhattan.

At Stony Brook, diversity is a necessity for intellectual excellence. Since a third of the graduate enrollees are African-American, Latino, Native American, and international students, Stony Brook is a place where cultures converge for the mutual enrichment of all.

The Campus

The fountain at the center of the six-acre Academic Mall is a focal point for social activity. Surrounding the fountain are lawns, shrubs, gardens, trees, and a brook that cascades down steps leading to the campus' main entrance. A nature preserve, six miles of bicycle paths, park benches, an apple orchard, and a duck pond are interspersed among the spacious plazas, modern laboratories, and classroom buildings. Surrounding the Frank Melville Jr. Memorial Library at the center of the campus are the academic buildings for the Colleges of Arts and Sciences and Engineering and Applied Sciences, the Van de Graaf nuclear accelerator, the Administration Building, Jacob K. Javits Lecture Center, Computer Science Building, Educational Communications Center, Computing Center, Stony Brook Union, Sports Complex, Student Activities Center, and other service and activities buildings. In front of the Staller Center for the Arts is an outdoor plaza in which concerts and gatherings are held. Adjacent to Staller is the Charles B. Wang Center, a 120,000-square-foot conference facility and venue for cultural, professional, and educational events. The Center also has Asian food, sprawling gardens, pools, and terraces.

On the East Campus, the Health Sciences Center houses academic and support areas for five professional schools and University Hospital, which opened in 1980. There is the 350-bed Long Island State Veterans Home, which opened its doors in 1991; the Long Island High Technology Incubator, which opened in 1992 and houses start-up companies in biotechnology and other high-tech fields; and the new Ambulatory Surgery Center, a spacious, state-of-the-art facility designed to create a stress-free outpatient surgery experience for adult and pediatric patients.

Encircling the academic buildings are the residential quadrangles, which are the basic social units for on-campus students, providing residence halls, dining rooms, and a range of student-sponsored enterprises and social facilities. A complex of one-, two-, and three-bedroom apartments that houses married and graduate students is located near the Health Sciences Center. Additional graduate student residences are located on the West Campus.

On the south campus, beyond the nature preserve and linked by shuttle bus to the rest of the campus, are 11 buildings housing the Marine Sciences Research Center and the School of Dental Medicine.

Stony Brook's Manhattan facility, located at 401 Park Avenue South, is designed to accommodate special undergraduate, graduate, and non-credit courses, plus seminars, internships, and events. It has 11 classrooms, two conference rooms, faculty office space, and an open area for lectures, receptions, and conferences.

Students

Stony Brook's enrollment is 22,355 students. Graduate students number 8,271 while undergraduate students number 14,084. The Health Sciences Center provides undergraduate and graduate education to 3,024 students in medicine and health professions. Graduate students come from most states in the nation and from many countries around the world.

Stony Brook is committed to ensuring educational opportunity at the undergraduate, graduate, and professional levels to students from groups that historically have not been equally represented in higher education. The University recognizes its responsibility to develop leaders among these groups and values the contribution to the educational environment made by a diverse student population.

Faculty

The vast majority of Stony Brook's 1,570 faculty members hold doctoral degrees, and 90 percent or more are engaged in active research leading to publication, much of it supported by external grants and contracts. The faculty-student ratio is about one faculty member for every 14 students.

Eminent faculty members include Einstein and Distinguished Professor Emeritus C.N. Yang, Nobel Laureate in Physics; John Milnor, Distinguished Professor and holder of the Fields Medal, Director of the Institute for Mathematical Sciences; Gail Mandel, Howard Hughes Medical Institute Investigator and Distinguished Professor in Neuroscience; University Professor John H. Marburger in Physics and Electrical Engineering, former president of Stony Brook and currently President Bush's National Science Advisor; Artists-in-Residence in Music, the Emerson String Quartet and Ani Kavafian; *Distinguished Professors* James Glimm in Applied Mathematics and Statistics, also recipient of the 2002 National Medal of Science; William Lennarz and Rolf Sternglanz in Biochemistry and Cell Biology; Benjamin Chu and Iwao Ojima in Chemistry; Louis W. Ripa Jr. in Children's Dentistry; Barry McCoy and Peter van Nieuwenhuizen in the C.N. Yang Institute for Theoretical Physics; Lorne M. Golub in Dental Medicine; Serge Luryi and Armen Zemanian in Electrical and Computer Engineering; Joel T. Rosenthal in History; Donald Lindsley and Donald Weidner in Geosciences; Robert Aller and Cindy Lee in the Marine Sciences Research Center; H. Blaine Lawson Jr., Dusa McDuff, John Milnor, and Dennis Sullivan in Mathematics; Fu-Pen Chiang in Mechanical Engineering; Gilbert Kalish in Music; Lorne Mendell in Neuroscience; Israel Kleinberg in Oral Biology and Pathology; Arthur P. Grollman and Edward Reich in Pharmacological Sciences; Don Ihde in Philosophy; Gerald E. Brown, Paul Grannis, Janos Kirz, Konstantin K. Likharev, Edward Shuryak, and Philip Solomon in Physics

and Astronomy; Milton Lodge in Political Science; M. Christina Leske in Preventive Medicine; and K. Daniel O'Leary and Howard Rachlin in Psychology; *Distinguished Professors Emeriti* Paul Poppers in Anesthesiology; H. Bentley Glass in Biological Sciences; Jacob Bigeleisen and George Stell in Chemistry; Theodosios Pavlidis in Computer Science; Robert Sokal in Ecology and Evolution; Louis Simpson in English; Robert Cess in the Marine Sciences Research Center; Herbert Herman in Materials Science and Engineering; Charles Rosen in Music; Seymour Cohen in Pharmacological Sciences; William Van der Kloot in Physiology and Biophysics; Morton Meyers in Radiology; John Gagnon in Sociology; and Felix T. Rapaport in Surgery; *Distinguished Teaching Professors* Jack Stern in Anatomical Sciences; Alan Tucker in Applied Mathematics and Statistics; Robert C. Kerber in Chemistry; S. Stanley Alexander in Dental Medicine; Michael Barnhart in History; Patrick Grim and Helen Rodnite Lemay in Philosophy; Harold Metcalf in Physics and Astronomy; Norman Goodman and Judith Tanur in Sociology; and Jonathan F. Levy in Theatre Arts; *Distinguished Teaching Professors Emeriti* Elof Carlson in Biochemistry and Cell Biology; Homer Goldberg and Rose Zimbardo in English; Barbara Elling in Germanic and Slavic Languages and Literatures, and Thomas Liao and John Truxal in Technology and Society; *Distinguished Service Professors* David W. Krause in Anatomical Sciences; Mario Mignone in European Languages and Cultures; Gilbert Hanson and Robert Liebermann in Geosciences; Irwin Kra in Mathematics; Barry S. Coller in Medicine and Pathology; Peter Paul in Physics and Astronomy; Dorothy Lane and M. Christina Leske in Preventive Medicine; Norman Goodman in Sociology; and David Ferguson and Lester Paldy in Technology and Society; *Distinguished Service Professors Emeriti* Velio Marsocci in Electrical Engineering; Robert Cess in the Marine Sciences Research Center; J.R. Schubel, former Dean and Director of the Marine Sciences Research Center; Sidney Gelber in Philosophy; Eli Seifman, Social Sciences Interdisciplinary and Director Emeritus of the Center for Excellence and Innovation in Education.

Stony Brook's distinguished faculty also includes 11 members of the American Academy of Arts and Sciences, 12 members of the National Academy of Sciences, and three members of the National Academy of Engineering. More than 300 scholars from 40 countries conduct research and teach at Stony Brook for periods of time throughout the year.

Degree Opportunities

Graduate study is offered in more than 40 different graduate studies areas as well as in the five schools of the Health Sciences Center and the School of Professional Development. The doctoral degree is offered in 40 areas, the M.A.T. in 10 areas, the M.A. in 28 areas, and the M.S. in 21 areas. Also offered are a Master of Business Administration in Technology Management, Master of Music degree, a Master of Fine Arts degree, a Master of Philosophy degree, a Doctor of Musical Arts degree, and a Doctor of Arts degree in Foreign Languages. In the Health Sciences Center the M.D. and Ph.D. degrees are offered by the School of Medicine, the D.D.S. by the School of Dental Medicine, the M.S.W. and Ph.D. degrees by the School of Social Welfare, and the M.S. degree by the School of Health Technology and Management and the School of Nursing. At the undergraduate level, many departmental major programs and interdisciplinary programs leading to the B.A., B.S., and B.E. degrees are offered by the College of Arts and Sciences, the College of Engineering and Applied Sciences, the W. Averell Harriman School for Management and Policy, and the Health Sciences Center.

Academic Units

College of Arts and Sciences

The College of Arts and Sciences consists of the following departments: Africana Studies, Anthropology, Art, Asian and Asian American Studies, Biochemistry and Cell Biology, Chemistry, Comparative Studies, Ecology and Evolution, Economics, English, European Languages and Literatures, Geosciences, Hispanic Languages and Literature, History, Linguistics, Mathematics, Music, Neuroscience, Philosophy, Physics and Astronomy, Political Science, Psychology, Sociology, and Theatre Arts; and of programs in Women's Studies and Writing and Rhetoric.

In the biological sciences, the Ph.D. degree is offered in Cellular and Developmental Biology, Ecology and Evolution, Genetics, Molecular Biology and Biochemistry, and Neuroscience.

English, Hispanic Languages and Literature, Music, and Philosophy offer the Ph.D., as does Comparative Literature within the Ph.D. in English. European Languages offers M.A. degrees in French, Italian, German, and Russian. The Department of Art offers the Ph.D., M.F.A., and M.A. degrees. The Department of Theatre Arts has a program leading to the M.F.A. and Music offers, in addition to the Ph.D. and the M.A., the D.M.A. and the M.M.

The departments of Anthropology, Chemistry, Geosciences, Economics, History, Mathematics, Physics, and Astronomy, Political Science, Psychology, and Sociology offer Ph.D. and M.A. degrees.

Every graduate program is guided by a director and an executive committee, and establishes its own entrance standards and degree requirements in addition to those of the Graduate School. For detailed descriptions of the programs, consult the individual listings. Inquiries should be addressed to the appropriate graduate director.

The office of the dean of the College of Arts and Sciences is located in the Melville Library, Room E-3320. The phone number is (631) 632-6991.

College of Engineering and Applied Sciences

The College of Engineering and Applied Sciences consists of eight academic units: The departments of Applied Mathematics and Statistics, Biomedical Engineering, Computer Science, Electrical and Computer Engineering, Materials Science and Engineering, Mechanical Engineering, Technology and Society, and the W. Averell Harriman School for Management and Policy. Six of these units offer programs leading to the Master of Science and Doctor of Philosophy degrees, and the Harriman School and the Department of Technology and Society offer Master of Science degrees.

Each department/school has its own laboratories for teaching and research; in addition, collaborative research programs are carried out utilizing the facilities in the Health Sciences Center, the College of Arts and Sciences, the Marine Sciences Research Center, Brookhaven National Laboratory, and other off-campus national and industrial laboratories. The graduate programs in the

College of Engineering and Applied Sciences are designed to train both academically oriented students and those with professional goals in industrial and governmental occupations requiring an advanced degree.

Each academic department/school evaluates candidates for admission to its programs. Prospective applicants should address inquiries directly to the graduate director of the appropriate program.

The Dean of the College of Engineering and Applied Sciences is Yacov Shamash, who is located in the Engineering Building, Room 100, (631) 632-8380.

Health Sciences Center

Unleashing the power of medicine through technology has been the catalyst for sweeping changes in health care this decade. Already the discoveries made by Stony Brook's basic and clinical researchers who develop new approaches to treatment, new drugs, and new methods of transplantation have changed the quality of life for Americans. Stemming from the 1963 mandate of the Muir Report that recommended the creation of new state medical, dental, and nursing schools, the Health Sciences Center (HSC) is composed of five professional schools. The schools—Dental Medicine, Health Technology and Management, Medicine, Nursing, and Social Welfare—offer full-time professional education to almost 3,000 students and conduct programs in research, service, and continuing education. Additionally, the Long Island State Veterans Home serves as a teaching center for students from all professions.

More than 2,500 skilled professionals from the Long Island region have faculty appointments and participate in the Center's five schools. While teaching a full load of courses per semester, full-time faculty pursue scholarly research and publication, as well as curriculum development and active participation in campus committee activities. All HSC students, as part of their clinical training or fieldwork, work for a specific time with some of Long Island's health and welfare agencies. The Health Sciences Center also sponsors conferences, workshops, and lectures for the general community. The HSC schools share instructional space and multidisciplinary laboratories in addition to the support services of the HSC Library and the Coller Learning Center, the Division of Laboratory Animal Resources, Media Services, and the Office of Student Services. The Center also includes a bookstore, bank, and food service area.

As one of the nation's leading academic health centers, Stony Brook's Health Sciences Center is committed to fulfilling its abiding missions: research-based patient care, education, basic and clinical research, and community service. Using multi-disciplinary foci and partnerships that create a synergy among the schools and departments with external resources, the HSC has developed centers of excellence in cancer, heart, neonatology, autism, and molecular medicine, among others. It is developing a comprehensive academic Long Island Cancer Center that includes broad-based clinical care, as well as clinical, translational, and basic research programs. The Centers for Molecular Medicine have formalized interdisciplinary collaborations by creating laboratories, some virtual and some real, that extend beyond the traditional departmental boundaries. The themes include Molecular Medicine, Infectious Disease, Cancer and Cancer Genetics, Developmental Genetics, Structural Biology, Brain and Spinal Cord Research, and Molecular Cardiology. Its health sciences curricula have been continually refined, strengthened, and expanded, but always in keeping with its educational philosophy emphasizing individualization of instruction and development of the complete professional. Students who want detailed information on the extensive laboratory and research facilities available for various academic programs are encouraged to address their inquiries to the appropriate school or department.

According to a survey done by the Association of University Technology Managers, Stony Brook University placed 12th among the 139 institutions in the country in royalties generated by its scientific discoveries. The majority of the University's research contributions come from the Health Sciences Center. Two HSC research discoveries, ReoPro, used in coronary disease treatment, and Periostat, used in gum disease treatment, are the greatest royalty income generators. The development of the yeast two-hybrid system by the School of Medicine faculty has revolutionized the study of protein-protein interactions and is one of the most highly cited technologies in biomedical research.

As the major teaching facility for the educational programs of the Health Sciences Center, University Hospital, a 504-bed hospital, serves the health care needs of the nearly three million residents of Long Island and provides training for physicians, nurses, social workers, dentists, and allied health professionals. Through subspecialties, the School of Medicine's 18 clinical departments offer consultation and care using a full array of specialized diagnostic and treatment techniques. The hospital is the only academic medical center based hospital in Suffolk County and serves as the region's "quaternary" hospital, providing services to the region's high-risk medical patients. There are nine intensive care units dedicated to anesthesia, burn, cardiovascular, coronary, and neonatal and transplant patients. The neonatal intensive care unit provides the only tertiary care services for premature and newborn infants in Suffolk County. Utilizing the latest diagnostic and evaluative techniques, the prenatal diagnostic unit—the only American Institute of Ultrasound in Medicine (AIUM) accredited unit on Long Island—identifies potential problems and solutions for high-risk pregnancies.

In addition to being part of the only academic medical center on Long Island, University Hospital serves many regional roles. As the designated Regional (Level I) Trauma Center, helicopter and ground transports deliver Suffolk County's most seriously injured and ill patients to the hospital. The seven-bed shock trauma room is specifically designed for treating patients with problems ranging from multiple traumas to cardiogenic shock. University Hospital also serves as the county referral center for all psychiatric emergencies. The hospital is designated as the regional perinatal center and the regional kidney transplant center. Adults and children with a variety of chronic conditions such as diabetes, cystic fibrosis, and multiple sclerosis receive specialized care and advanced services.

Detailed information about the professional programs offered by the five schools is contained in the *Health Sciences Center Bulletin*. Since the Center's training of health professionals requires special academic programming and support services, significant sections of the data contained in the *Graduate Bulletin*, such as admission procedures and requirements, registration, student services, educational expenses, financial aid, and the academic calendar, are not applicable to the

Health Sciences Center. Exceptions are the Ph.D. programs in Basic Health Sciences, which include Anatomical Sciences, Molecular Microbiology, Oral Biology and Pathology, Pathology, Pharmacological Sciences, Physiology and Biophysics, and Social Welfare. These programs are described in detail in this Bulletin. A new master's program in Public Health is being developed and should be ready to accept students for the fall semester 2004.

The *Health Sciences Center Bulletin* can be obtained by contacting the Health Sciences Center Office of Student Services at (631) 444-2111, or by contacting the office of the dean of a specific school.

Marine Sciences Research Center

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 offers a master's and Ph.D. program in Marine and Atmospheric Sciences.

School of Professional Development

The School of Professional Development (SPD) offers graduate credit programs for both part-time and full-time students. Two of the University's three largest part-time graduate programs are the Master of Arts in Liberal Studies and the Educational Leadership Certificate. Other degrees include the Master of Arts in Teaching (MAT) in Biology, Chemistry, Earth Science, English, French, German Italian, Mathematics, Physics, Russian, and Social Studies; and the Master of Professional Studies in Human Resource Management and Waste Management.

Students can also earn a number of Advanced Graduate Certificates through SPD. Certificate programs include those in coaching, computer integrated engineering, educational computing, environmental/occupational health and safety, human resource management, industrial management, information systems management, operations research, school administration and supervision, school district administration, and waste management.

SPD's Division of Career Development offers a wide range of comprehensive, non-credit courses in business and professional skills training. There are certificate programs in computer training, professional skills development, and professional licensing and training. SPD also has an Information Technology Certificate Center that offers certifications in CISCO, A+, Network+, MCP, MCSA, and MCSE.

SPD offers courses and programs on campus, off-campus at convenient locations, and online in an asynchronous modality. The courses and programs address individual career goals and complement, where appropriate, many of the University's credit and degree programs.

Visit SPD on the Web at *www.stonybrook.edu/spd* for program information, course descriptions, or to apply for admission. For additional information, call (631) 632-7050, option 3, or write to N-201 Ward Melville Social and Behavioral Sciences Building, Stony Brook University, Stony Brook, NY 11794-4310.

Research

Research and scholarly and creative activity constitute a primary University mission, closely coupled with instruction, especially at the graduate level. As a SUNY campus, Stony Brook has its sponsored project funds administered under a statewide memorandum of understanding by the Research Foundation of SUNY (RF), a 50-year-old not-for-profit corporation whose local activities are directed by Stony Brook's Vice President for Research acting as RF's campus Operations Manager. The Foundation also provides the flexibility to establish affiliated corporations to facilitate university-industry-government partnerships and accelerate the growth of research opportunities; for Stony Brook these include Brookhaven Science Associates, through which Stony Brook and Battelle Memorial Institute manage Brookhaven National Laboratory for the U.S. Department of Energy, and Long Island High Technology Incubator, Inc., Long Island's first facility for technology start-ups, ranked first in a recent National Business Incubation Association survey. For the past three years, SUNY has ranked in the top 15 nationally in technology transfer, as measured by licensing revenues received for its technologies, according to the Association of University Technology Managers; the Stony Brook campus is responsible for generating more than 95 percent of those revenues and for 30 to 70 percent of technology transfer activity among SUNY's 64 campuses, including invention disclosures, patents, and licenses.

Stony Brook generates more than $141 million in annual research activity from external sources across the spectrum of disciplines. More than 2,500 sponsored projects are under way at any given time in the form of organized research, training programs, public service activities, and educational support; some 900 graduate students annually are supported by these projects.

The offices reporting to the Vice President for Research assist researchers through the following major functional activities:

Research Resources Center: Online and hard copy materials may be accessed to assist in identifying appropriate funding source, including the more than 23,000 records, representing over 400,000 funding opportunities, of the Community of Science.

Office of Sponsored Programs: Coordinates proposal submissions, negotiates contract and grant awards, and accepts and establishes sponsored awards on behalf of the University.

Office of Grants Management: Monitors sponsored award expenditures and cost sharing activity and provides financial accounting and reporting to sponsors and project directors.

Office of Research Compliance: Administers the campus' compliance with laws and regulations dealing with research involving human subjects, laboratory animals, and recombinant DNA; monitors compliance with federal and university requirements regarding conflict of interest relating to sponsored research; and coordinates the investigation of allegations regarding scholarly misconduct.

Office of Technology Licensing: Assists in the preparation of invention disclosures and marketing of such property to the private sector; focuses on issues regarding patents, copyrights, technology transfer, and intellectual property of all kinds. Students are urged to consult this office regarding any agreements involving research activities in which they are named or which they may be asked to execute with external organizations.

Office of Economic Development: Links the academic and research resources of the campus with the economic needs of Long Island and New York State and supports resources related to them.

These offices recognize the importance of research and scholarly and creative effort to the University, the region and State, and society at large,

and stand ready to assist and advise faculty and student researchers in the pursuit of these essential activities.

Special Centers and Institutes

The University is home to myriad centers, laboratories, and institutes, many of them externally funded, which reflect the broad diversity of academic and research-oriented pursuits on campus. Many of these organizations are directed by Stony Brook faculty and staff. Students may benefit from these facilities by tapping them as resources for academic work.

Among these organizations are the AIDS Education and Resource Center; Alzheimer's Research and Assistance Center; Ambulatory Surgery Center; Asthma Center; Breast Care Center; Burn Center; Center for Advanced Sensor Systems; Center for Biotechnology; Center for Cancer Genetics; Center for Excellence in Innovation and Education; Center for Excellence in Learning and Teaching; Center for India Studies; Center for Infectious Diseases; Center for Information Systems Management; Center for Italian Studies; Center for Public Health Education; Center for Health Policy and Management; Center for Regional Policy Studies; Center for Structural Biology; Center for Study of Working Class Life; Center for Survey Research; Centers for Molecular Medicine and Biology Learning Laboratories; Cleft Palate/Craniofacial Center; C.N. Yang Institute for Theoretical Physics; Cody Center for Autism and Developmental Disabilities; Cystic Fibrosis Center; Dental Care Center; Diabetes and Metabolic Diseases Research Center; DNA Sequencing Facility; General Clinical Research Center; Heart Center; HIV Treatment Development Center; Howard Hughes Medical Institute; Humanities Institute; Institute for Cell and Developmental Biology; Institute for Conservation of Tropical Environments; Institute for Long Island Archaeology; Institute for Mathematical Modeling; Institute for Mathematical Sciences; Institute for Medicine in Contemporary Society; Institute for Terrestrial and Planetary Atmospheres; Language Learning and Research Center; Latin American and Caribbean Studies Center; Long Island Cancer Center; Long Island Geriatric Education Center; Long Island High Technology Incubator; Lung Cancer Evaluation Center; Lyme Disease Center; Mass Spectrometer Facility; Mineral Physics Institute; National Pediatric MS Center; New York Sea Grant Institute; New York State Center for Advanced Technology in Medical Biotechnology; New York State Center for Sudden Infant Death Syndrome; Osteoporosis Center; Pollock-Krasner House and Study Center; Professional Development Research Center; Proteomics Center; Sleep Disorders Center; Small Business Development Center; University Microscopy Imaging Center; and Waste Management Institute

Publications

Some of the publications edited or published at the University include *Art Criticism, Circuits, Systems, and Signal Processing; Coastlines, Continental Philosophy; Corrosion Engineering; Critical Reviews in Surface Chemistry; Evolution; Evolutionary Anthropology; Forum Italicum; Gradiva; Hypatia; International Association for Philosophy and Literature; Journal of College Science Teaching; Journal of Educational Technology Systems; Journal of Environmental Systems; Journal of Thermal Spray Technology; Long Island Historical Journal; Magneto-Optical Recording Materials; Materials Science and Engineering; Minnesota Review; Philosopher's Annual; The Physics Teacher; Quarterly Review of Biology; SUNY Series in Aesthetics; Transplantation Proceedings;* and *Victorian Literature and Culture.*

Campus-Community Ties

As the public university center for the metropolitan New York region, Stony Brook plays a major role in the Long Island community. The University is the largest single-site employer on Long Island, with more than 13,500 employees. It is estimated that the University generates approximately $2.5 billion annually in regional economic impact. The University is a principal regional resource for high-technology research collaboration, the development needs of a highly skilled work force, and technical support for myriad public policy challenges.

What sets Stony Brook apart from most other institutions of its kind is the University's commitment to support and partner with local businesses. To that end, the University has developed several innovative economic development programs that provide vital assistance to Long Island's growing companies. The University sponsors two State-designated Centers for Advanced Technology—the Sensor Systems CAT and the Center for Biotechnology—which are designed to promote industry growth vital to the state's economic future. Also fueling new economic growth is the University's Long Island High Technology Incubator, where entrepreneurs occupy nearly 200,000 square feet of commercial space and have earned more than $100 million in annual revenues. A second incubator, founded in cooperation with Computer Associates International, Inc., is devoted to software development, making Stony Brook the only SUNY campus with two new business incubators. Faculty and graduate students are encouraged to take their technology to the marketplace and enroll in the Incubator program. The Incubator Web site is at *www.lihti.org.*

The Small Business Development Center at Stony Brook has created or saved 3,000 jobs on Long Island in the past decade, and the Strategic Partnership for Industrial Resurgence has worked with 220 companies on more than 1,150 projects, creating or saving 8,500 jobs. The region's extraordinary profusion of coastal environments is a living laboratory for the Marine Sciences Research Center, one of the world's leading centers for coastal oceanography. Senior public and private sector managers and analysts are trained by the Harriman School for Management and Policy, while the Center for Corporate Continuing Education and Training serves all segments of business and industry with non-credit instruction.

University Hospital serves the health care needs of the residents of Long Island and provides training for physicians, nurses, social workers, dentists, and allied health professionals. Since opening in 1980, the hospital has utilized the very latest in medical knowledge and technologies to meet the special needs of its patients. The hospital offers highly specialized services, using the most sophisticated instrumentation and computerized physiological monitoring systems available.

Through subspecialties, the departments of medicine and surgery offer consultation and care using a full array

of specialized diagnostic and treatment techniques. The hospital consists of 504 beds, of which nine intensive care units are dedicated to anesthesia, burn, cardiovascular, coronary, pediatric, medical, surgical, and transplant patients. It houses the area's only Perinatal Center, providing care to women and infants with complex needs. The hospital also performs more than 900 cardiac procedures annually, including open heart surgery, and has a new orthopedic facility with the resources to treat even the most complex skeletal problems.

The Long Island State Veterans Home is a 350-bed nursing home that serves New York State veterans. It is located on the University campus, one-half mile east of University Hospital. The veterans home is unique in the United States because it is the first nursing home to be fully integrated into the health care, educational, research, and regional development missions of a major university.

Regional business and civic leaders help guide the Stony Brook Foundation—the University's independently incorporated development arm—and community members with special interests in campus programs participate in the Association for Community-University Cooperation, the Friends of the Staller Center for the Arts, and the University Hospital Auxiliary. In addition to the University's many degree programs, there are broad opportunities for credit-bearing and noncredit instruction for individuals pursuing specific, limited objectives or seeking personal enrichment.

In addition to its function as Long Island's major research university and source of advanced and specialized instruction, Stony Brook provides a social and cultural center, a specialized referral center for health care, recreational opportunities, and a broad range of other services for individuals and groups in the public and private sectors. Several hundred concerts, lectures, films, theatre productions, art exhibits, and sports events on the campus are open to the public each semester, many at no charge. It is estimated that several hundred thousand people attend these events annually or visit the campus to take advantage of other facilities and services.

Staller Center for the Arts

With the installation of a 35 mm motion picture system that features a 40-foot film screen, projection booth, and Dolby stereo sound system completed in the Main Stage theatre, Stony Brook University's Staller Center became Long Island's only arts facility to offer professional music, dance, theatre, fine art, and film.

The center's professional performance season opens in September and includes a score of live professional events and an eclectic schedule of films throughout the year. World class artists and ensembles such as Mandy Patinkin, Judy Collins, the Moscow State Symphony Orchestra, and the Emerson String Quartet appear on the Staller Center stages alongside other internationally renowned musicians, dancers, actors, and actresses. The *Not Just for Kids* series offers live musical theatre and other attractions for children and their families. There are additional performances produced by outside presenters on the calendar, such as the Long Island Philharmonic and the Seiskaya Ballet production of *The Nutcracker*.

Staller Center presents events produced by Stony Brook University's departments of theatre, music, and art. Gifted students and guest artists perform under the direction of Stony Brook faculty, artists-in-residence, and guest artists.

In July, Staller Center presents the Stony Brook Film Festival, which showcases dozens of independent films from the United States and abroad.

Department of Athletics

The Intercollegiate Athletics Program provides young men and women unique opportunities for learning not found in other academic environments of the University. The Program embraces the NCAA's principles of sportsmanship and ethical conduct, and in so doing, provides student-athletes with opportunities to develop positive character and leadership qualities through competitive sport participation and community service.

The Intercollegiate Athletics Program is committed to achieving academic and athletic excellence and to promoting the general welfare of its student-athletes. In achieving these goals, the Program conforms to the letter and spirit of all rules and regulations of the University and of all the athletic bodies of which it is a member.

Through its various activities, the Program offers broad opportunities in an environment that is free of bias—it supports equitable opportunities for all students and staff, including women and minorities. The diversity of offerings and participants plays an important role in improving campus life for students, faculty, staff, and the community.

Policies and Procedures

Maintenance of Public Order

The University wishes to maintain the public order appropriate to a university campus without unduly limiting or restricting freedom of speech or peaceful assembly. The State University Board of Trustees' Rules for the Maintenance of Public Order (Part 535 of Title VIII—Compliance of Codes, Rules, and Regulations of the State of New York) are available on the Judicial Affairs Web site *http://studentaffairs.stonybrook.edu/judiciary/order*.

Office of the Student Judiciary

The Office of the Student Judiciary is responsible for investigating and adjudicating cases of alleged student misconduct (in nonacademic matters) in violation of the University Student Conduct Code. In addition, the judiciary educates the campus community about the code and provides a learning experience for students who volunteer to become student hearing board members.

For questions regarding the Conduct Code, the judiciary process, or procedures for filing a complaint, please see *http://studentaffairs.stonybrook.edu/judiciary* or contact the Director of Judicial Affairs, 347 Administration Building, *Gary.Mis@stonybrook.edu*, (631) 632-6705.

Parking and Traffic

All graduate students who operate a car on campus are required to obtain a campus permit. Regulations have been established to govern vehicular and pedestrian traffic and parking on highways, streets, roads, and sidewalks owned, controlled, or maintained by the University. These regulations apply to students, faculty, employees, visitors, and all other persons upon such premises.

Online registration, campus information, bus schedules, rail links, parking

regulations and appeal procedures, and much more can be found on the Parking Services Web site at *www.parking.sunysb.edu*. Commuter students can sign up to purchase permits for the Stadium Lot and two additional premium lots: the Life Sciences Lot and the ESS Meter Lot. Payment for premium lots can be made by charge card or the fee can be added to your University Account. Evening students may want to take advantage of the evening garage pass, which costs $11.37 per month and is valid after 3:00 p.m. Monday to Friday. If you don't have computer access, call Parking Services at 632-AUTO for more information.

Student Conduct Code

As a document, the University Student Conduct Code defines acceptable community behavior. For a resident student, it translates into respect for your neighbors and their property. It prohibits tampering with fire safety equipment, i.e., fire alarms, fire extinguishers, fire bells, etc. It includes respecting state property as well as maintaining an acceptable noise level in the residence halls conducive to study and sleep.

For all students, the Student Conduct Code supports compliance with state and federal laws pertaining to drugs, alcohol, weapons, discrimination, physical abuse, sexual assault, acquaintance (date) rape, relationship violence, and racial, sexual, or sexual preference harassment.

To obtain a copy of the code or information regarding campus regulations and disciplinary proceedings as well as procedures for filing a complaint, contact the Director of Judicial Affairs in the Office of the Student Judiciary, 347 Administration Building, or call (631) 632-6705. A copy of the code can also be found at *http://ws.cc.stonybrook.edu/stuaff/Student_Handbook_2001.pdf*.

The Frank Melville Jr. Memorial Library, with 2 million books and 3 million publications in microformat, is one of the largest academic libraries in the nation.

Campus Resources and Student Services

Athletic Facilities

The Sports Complex is actually two separate buildings, Pritchard Gymnasium and the newer West Wing.

Pritchard Gymnasium

Pritchard Gym is one of the original buildings on campus, built in the late 1960s when the campus moved to Stony Brook from its Oyster Bay location. The gymnasium is 20,000 square feet and has three regulation basketball courts that can be divided by a moveable wall into two separate rooms. The smaller part of the gym is equipped with drop-down batting tunnels used by the baseball and softball teams during the winter months and inclement weather. The gym is primarily used now for physical education classes, recreation, and team practices.

Also located in the Pritchard side of the Sports Complex is the 25-yard swimming pool, the weight room, and various Athletics and Physical Education offices. Pritchard has seen major renovations to its office space in the past few years. One of the biggest additions and most utilized areas is the Goldstein Academic Center.

Goldstein Academic Center

The Goldstein Academic Center was dedicated in December 1997 through a gift made by Stuart Goldstein and the Sunny and Abe Rosenberg Foundation. The Center is the primary study hall for the student-athletes and is equipped with the latest computers and network connections for Internet access. The academic advisors and student-athlete service offices are located in the Center as well.

Dance Studio

Also in the confines of Pritchard Gym is a 600-square-foot dance studio equipped with hardwood floors and ballet bars. The room is used for physical education classes and the Recreation Department uses it for multiple activities.

West Wing

Opening in 1990, the West Wing was one of the biggest additions to the campus in many years. The arena is 40,000 square feet and houses three regulation basketball courts with the center hardwood floor serving as the main court for basketball and volleyball. The arena has a 177-meter rubber surface track surrounding the perimeter of the room. In addition to basketball and volleyball, the arena is home to numerous trade shows, ceremonies, and concerts throughout the year. The West Wing also has office space for Athletics administration staff as well as a new equipment room, training room, and locker facilities.

Athletic Training Room

The athletic training room contains rooms for hydrotherapy, rehabilitation, private physicians examination, as well as a general treatment area. The facility houses equipment to ensure the student-athletes are getting the best treatment available. An auxiliary training room in the new Kenneth P. LaValle Stadium supplements the primary room.

Squash Court/Lounge

The West Wing also has six squash courts that get used daily for classes and recreation. The court space and its adjoining lounge area were made possible by a gift from Stuart Goldstein. The lounge serves as prime space for meetings and receptions throughout the year.

Kenneth P. LaValle Stadium

Kenneth P. LaValle Stadium opened in 2002 and is the new home to the football and lacrosse teams. The state-of-the-art facility is the largest outdoor facility in Suffolk County and has become the backdrop for some of Long Island's most exciting sports events. The 8,200-seat stadium was built at the cost of $22 million and its unique design provides fans with a tremendous stadium experience. It has a three-tier press box on the east side and accommodates six luxury suites, a spacious working press box area, television and radio booths, and a camera deck on the roof. The south building houses the offices for the football and lacrosse staff as well as locker rooms for the teams. The facility was named Kenneth P. LaValle Stadium in honor of the New York State senator who was instrumental in making the stadium a reality.

Baseball/Softball Complex

Sitting back-to-back at the north end of the Athletic property is the baseball/softball complex. The baseball field is in its original location and had a face-lift when the skinned area was redone and new drainage and sprinkler systems were installed. The softball field was displaced when LaValle Stadium was constructed, and is now located next to the baseball field. Both fields have 25-foot scoreboards courtesy of Coca-Cola. The fields are the primary practice and competition facilities for the two teams.

Bookstores

The University Bookstore is located on the ground level of the Melville Library (opposite the Stony Brook Union). It stocks a wide selection of new and used textbooks, reference books, study aids, general books, school supplies, art supplies, engineering supplies, residence hall living supplies, Stony Brook logo clothing, Seawolves logo clothing, class rings, gifts and novelties, greeting cards, health and beauty aids, electronics, stationery, backpacks, magazines, candy and snacks.

Shop early for the best selection of used books and to avoid the rush at the beginning of the semester, or reserve your textbooks online at *www.stonybrook.edu/bookstore.*

The Bookstore buys back textbooks year-round at wholesale prices. To get the best price for your unwanted textbooks, sell them back to the bookstore as soon as finals week begins.

The University Bookstore's general books department carries many reference and technical titles that relate to academic programs and a wide selection of general reading books and magazines. Titles not in stock can be special ordered at no additional charge. For more information, call the University Bookstore at (631) 632-6550.

The Bookstore Campus Account (BCA) is a taxable debit account. It offers the convenience of purchasing textbooks and school supplies in the University Bookstore and Matthew's HSC Medical Bookstore without carrying cash; just present your University ID card. A BCA can be opened in the amount of $200, $300, $400, $500, $600, $700, $800, $900, $1,000, or $1,100. The amount you select is charged to your Student Account and may be deferred against financial aid or paid in monthly installments using the University's Time Option Payment Plan (TOPP). To open a BCA account, visit *www.stonybrook.edu/bca.*

The BCA may not be used to purchase popular literature, logo clothing, mugs, gifts, or other non-school supply merchandise.

The University Bookstore also offers the following services:

Prepackaged Textbook Program Customers who preorder get first selection of all used books in stock. Used books save 25 percent off new-book prices. Reservations must be received 30 days prior to the start of classes. Once your textbook reservation and class schedule are submitted, you will be contacted to confirm your request.

Textbook Guarantee Program Gold Shelf Tags in the textbook department indicate that a professor has ordered a

required textbook on time and students are entitled to the following guarantee. If the tag is gold and the required book is not available during the first two weeks of class, you get a $5 voucher to be used toward the purchase of the book. Restrictions do apply and are posted in the Bookstore.

Credit Card Authorization Parents can place their credit card on file with the University Bookstore to allow students to make purchases. Additional information and a printable Adobe Acrobat PDF version of the enrollment form is available at *www.sunysb.edu/provostliasn/bookstore/students/ccpreauth.html.*

Parent's Lifeline A variety of special services are available for parents, so they can send balloons, cakes for any occasion, flower bouquets, and small care packages. Call (631) 632-6553 to make arrangements.

Hours of Operation:
Monday 8:15 a.m.-6:00 p.m.
Tuesday 8:15 a.m.-7:00 p.m.
Wednesday/Thursday
8:15 a.m.-6:00 p.m.
Friday 8:15 a.m.-5:00 p.m.
Saturday 12:00 p.m.-4:00 p.m.

Please Note: The bookstore is open for extended hours during the first two weeks of each semester.

The Health Sciences Center (HSC) Bookstore is operated by Matthew's Medical Bookstores under the direction of the Faculty Student Association. Located in Room 310 on Level 2 of the Health Sciences Center, it offers the largest selection of medical/health science books in the region, in addition to textbooks, school supplies, a range of college merchandise, daily necessities, and medical equipment for practitioners. The HSC Bookstore honors special book requests, providing customers with easy access to the hundreds of thousands of medical reference titles available. The HSC Bookstore also carries a wide selection of imprinted clothing and gifts, greeting cards, stationery items, general reading books, and magazines.

Hours of Operation:
Monday-Thursday 8:30 a.m.-6:00 p.m.
Friday 8:30 a.m.-5:00 p.m.
Saturday 9:00 a.m.-1:00 p.m.

For more information, call the HSC Bookstore at (631) 444-3685 or visit *www.matthewsmedsuny.com.*

The University Bookstore and the Health Sciences Center Bookstore are both operated under the direction of the Faculty Student Association's Retail Services Committee. FSA's Bookstore Contracts Administrator, Donna O. Klingel, can be reached at (631) 632-9829 or *Donna.Klingel@stonybrook.edu.*

Career Center

The Career Center, a member of the Student Affairs family, assists graduate students with all types of career decision-making and planning concerns. Services range from providing forums to interact with potential employers to on-campus recruitment to job/internship fairs. Graduate students may find the Center's practice interviewing and personal assessment instruments especially helpful in making the transition from an academic setting to the private/public sector. The Career Center offers individual and group counseling on the topics of job-search strategies, resume writing, and interviewing. Students can access the Center's Web site at *www.stonybrook.edu/career,* which has valuable job-search links such as Monstertrak, a comprehensive student resume database and referral system. Graduate students are invited to visit the Career Center, which is located near the foot of the Zebra Path walkway and on the ground level of the Melville Library, Room W-0550. The office is open Monday through Friday, from 8:30 a.m. to 5:00 p.m. Call (631) 632-6810 for an appointment or walk in to look at career information and employment opportunities.

Child Care

The University has on-campus, year-round child care services for 160 children ranging in age from two months to five years. Stony Brook Child Care Services is a nonprofit, nationally accredited center providing service for University students, faculty, and staff. The Center is staffed by professionals in the early childhood field who are assisted by students enrolled in coursework practice. Hours of operation vary. Fees are charged on a scale based on income.

The primary aim of the Center is to provide a warm, supportive, and creative atmosphere in which each child and his or her family are regarded as individuals. There is a waiting list for the Center; therefore, it is wise to call for an application well before you need the service since placement cannot be guaranteed. For further information or an application, call (631) 632-6930.

Computing Services

The Division of Information Technology has the overall responsibility for managing the computing, networking, and telecommunications at Stony Brook. The University's computing and networking environment is characterized by an ever-changing array of hardware, software, network connectivity, and consulting services. In addition to the services listed below, which are available to the entire campus community, individual departments offer computing and networking facilities for their constituents.

The campus network is connected to both the commodity Internet and Internet2. Both connections are at the OC3 speed, 155MBPS. All of the academic buildings are connected to the network with fiber-optic cable. Off-campus access to the computer network is available by calling (631) 762-1000. For additional information about networking services please refer to the campus home page (*www.stonybrook.edu*) under "For Students, Division of Information Technology," or call (631) 632-6120.

Two Sunfire 4810 and other Sun application and files servers comprise the administrative computing environment. These machines serve as the administrative servers and database repositories for the University's business systems. Electronic mail is provided through Lotus Notes, Unix mail, and POP3 and IMAP servers. High-speed printing is provided by the three Xerox Docuprint 65 printers. For information about computer accounts, contact the Computer Accounts Office at (631) 632-8011.

Client Support Services are available. For more information call (631) 632-9800.

General computing resources are available to all students through Instructional Computing, with offices in S-1460 Frank Melville Jr. Memorial Library (631-632-8050). Here students can use Macintoshes, PCs, and Unix workstations. Student consultants are also available to answer questions and assist students in using these systems (631-632-9602). Students can obtain information on the additional eight public sites as well as documentation for using the various computers. One-hour introductory courses are offered to help students use the public computing facilities. Any Stony Brook student may obtain an account on the instructional computing facilities for e-mail, Internet access, and general computing. Computer accounts are available from the Library SINC site.

Counseling Center

The University Counseling Center provides consultation, crisis intervention, brief psychotherapy, group and couple's therapy, psychiatric services, and referral services for longer-term therapy for students matriculated in a degree program and who are registered for a minimum of six credits. Counseling services are available year-round and are free of charge. All information about counseling at the Center is strictly confidential, except information that is needed in situations of imminent threat or danger. The Center also provides training in mindfulness meditation, which is recommended for many anxious and depressed students. Consultation is provided on mental health issues to the University as a whole. The University Counseling Center is located on the second floor of the Student Health Center. During the academic year, it is open from 8:00 a.m. to 5:00 p.m., Monday, Wednesday, Thursday, and Friday, and on Tuesday, from 8:00 a.m. to 7:00 p.m. During the summer, inter-session, and spring recess, it is open from 8:00 a.m. to 4:00 p.m., Monday to Friday.

Appointments for an initial consultation can be made by calling (631) 632-6720. In emergency situations, students should tell the receptionist that this is an emergency and they will be seen right away without a scheduled appointment. Any student needing a disability-related accommodation should call the Counseling Center at (631) 632-6720.

For mental health emergencies after hours and on weekends, students should call Public Safety (631-632-3333) or go to University Hospital. Students who are not experiencing an emergency but who want to speak with someone after hours or on weekends may call the Response Hotline at (631) 751-7500 or the University Response Hotline at (631) 632-HOPE.

Because adjusting to the University can be stressful, new students are encouraged to come to the Center in their first year rather than wait until they experience a serious crisis. Students should visit the Center's Web site at *www.sunysb.edu/stuaff/counsel* for more details about services and for links to useful resources, including pamphlets on relevant mental health topics.

Disability Support Services

Disability Support Services (DSS) coordinates advocacy and support services for students with disabilities. These services assist integrating students' needs with the resources available at the University to eliminate physical or programmatic barriers and to ensure an accessible academic environment. All information and documentation of student disabilities is confidential.

Students are responsible for identifying and documenting their disabilities through the DSS office. Students receive assistance with special modified housing and on-campus transportation. DSS can assist with University procedures and requirements; test accommodations; counseling; and the recruitment of readers, interpreters, and note-takers.

Students who anticipate requiring assistance should contact Disability Support Services at (631) 632-6748/6749 (VOICE/TT is available) as early as possible to allow time for implementing recommended services. For more information, please visit the DSS Web site at *http://studentaffairs.stonybrook.edu/dss.*

Graduate Student Organization

The Graduate Student Organization (GSO) is the duly elected representative body for graduate student governance on campus. All graduate students who pay the activity fee, including those in the School of Professional Development (SPD) and the Health Sciences Center, are members. Each program has at least one representative in the GSO Senate, which sets policy and oversees the GSO budget.

The GSO acts as a liaison between the graduate student body and the University administration. The Senate serves as a forum for articulating and formulating graduate student interests. The GSO Executive Council advocates these interests in regular meetings with the University president and the dean of the Graduate School. The GSO Senate appoints graduate student representatives to a number of influential University advisory and policy-making committees, and dispatches delegates to the University Senate. These representatives advocate graduate student interests within the University's administrative structure and report to the GSO Senate on new policy developments.

The GSO provides a number of financial services for graduate students at Stony Brook. Resource Allocation Project (RAP) funds provide small travel grants to students presenting scholarly or artistic work at conference, provided their departments have an active senator. The GSO also distributes department allocations (cash grants) to the graduate student body in each program to be used as the students see fit, such as to purchase equipment and supplies or to sponsor a visiting scholar.

Two publications for graduate students are produced by the GSO. *The Graduate Student Survival Guide*, published at the beginning of each fall semester, provides a "student's eye" perspective on the operations of the Stony Brook campus and the resources available at the University and in the surrounding communities. *The Graduate* is a monthly newspaper reporting on policies and events of interest to graduate students.

The University Café, maintained by the GSO, is located on a quaint end of the Student Union adjacent to a lovely garden patio. Large open windows and oppositely facing mirrors provide enjoyable scenery inside or out of the Café, which offers premium coffee, espresso, teas, and a selection of beer, wine, and cocktails. The Café also provides an assortment of snacks and desserts. In addition, a broad range of evening entertainment, such as live music performances, karaoke, and poetry, play, and book readings, is scheduled regularly at the Café. There is no cover charge to graduate students. The venue is also open for use by the campus community to accommodate various functions or gatherings and provide a unique atmosphere. The University Café is open during the hours of 12:00 p.m. to 5:00 p.m. Monday and Tuesday and from 12:00 p.m. to 2:00 a.m. Wednesday through Saturday. Proof of age is required after the hours of 5:00 p.m.

The GSO office is located in the Student Activities Center, Room 227. For more information, call (631) 632-6492 or e-mail *gso@ic.sunysb.edu.*

Intensive English Center

E-5320 Melville Library
Stony Brook University
Stony Brook, NY 11794-3390
Phone: (631) 632-7031
Fax: (631) 632-6544
Web site: *www.sunysb.edu/iec*
E-mail: *IEC@stonybrook.edu*

The Intensive English Center (IEC) offers non-credit courses on a year-round basis: a spring semester starting in late January, a fall semester starting in early September, and a six-week summer program starting in mid July. Students are placed in levels ranging

from elementary through pre-academic advanced by means of comprehensive diagnostic examinations in the beginning of each session. Classes meet five days a week for a minimum of 18 hours. Core courses include daily instruction in speaking, listening, reading, and writing skills. These courses are supplemented by elective courses that include: Grammar, Oral Communication, Pronunciation/Accent Improvement, TOEFL Preparation, American Studies, and Business English.

During the summer, the IEC offers full-time and part-time programs supplemented by cultural and recreational activities. Students who have a minimum TOEFL score of 197 (CBT) may take the IEC part-time program and enroll in credit-bearing university courses.

The IEC welcomes graduate students who wish to improve their English proficiency or to satisfy the Graduate School's English proficiency requirements. The TOEFL requirement may be waived for those students who successfully complete the advanced level. The SPEAK test is given as an exit exam and appropriate recommendations are made to the Graduate School.

The IEC will issue an I-20 form (for an F-1 visa) to applicants who meet IEC admission requirements. For applications and more information, please contact the IEC office.

International Academic Programs

The Office of International Academic Programs administers programs with overseas universities. These programs allow graduate students to study and conduct research overseas. Many of these exchange programs also bring students from other countries to the Stony Brook campus.

For more information, call (631) 632-7030 or visit the office in E-5340 Melville Library.

International Services

International Services provides students, faculty, and scholars from other countries advice and assistance on U.S. government immigration regulations and cross-cultural issues relating to study, teaching, research, and living in the United States. International Student Advisors are available for advising Monday to Thursday from 9:30 a.m. to 4:30 p.m. on a walk-in basis and on Fridays by appointment. In addition, International Services works with community groups and student organizations to provide various programs and activities, including orientations, tours, discussion groups, workshops, and other events. International Services also provides a liaison for students with the Host Family Program.

International Services is located in the Graduate School, 2401 Computer Science Building. For more information call (631) 632-INTL, or visit the Web site at *www.grad.sunysb.edu.*

Libraries

The Stony Brook campus has a number of libraries established to meet the informational and cultural needs of the University community. The Frank Melville Jr. Library (Main Library) provides both an intellectual and physical focal point for the campus and is among the largest academic libraries in the nation. Within the Melville Library are collections serving the social sciences, humanities, fine arts and music, biology, engineering, geoscience, and general science. Service units in this building provide ready access to 8,000 current periodicals, more than 6,100 feature and educational videos, government documents, music scores, maps, microfilm, and legal material. Other service units of note are a new Music Library and Listening Center, a Patents and Trademarks Depository, a student lounge, two instructional computing classrooms, a video viewing center, and a variety of study areas.

The Reference Department in the Central Reading Room includes print, microfilm, and online indexes to information, encyclopedias and specialized reference works, current periodicals, and two dozen computer workstations. Reference staff provide on-demand assistance and instruction in searching for and evaluating information, using library resources, and doing research in particular areas.

The Special Collections Department houses the Senator Jacob K. Javits Collection of 2 million items of memorabilia and private papers, as well as the William Butler Yeats Microfilmed Manuscripts Collection, the University Archives, the Environmental Defense Fund records, and holdings of many Long Island political, cultural, and business manuscripts and records.

Four science branch libraries in other buildings—Chemistry, Math/Physics/Astronomy, Computer Science, and the Marine and Atmospheric Sciences Information Center (MASIC)—provide more specialized resources and services in their subject areas. The Health Sciences Library, separately administered, is located on the East Campus in the Health Sciences Center, Level 3. Collectively, the University libraries contain more than 2.5 million bound volumes and 3 million publications in micro-format. Library holdings may be accessed through the Stony Brook Automated Retrieval System (STARS), the online catalog that displays the holdings of all West Campus libraries, with the exception of materials that are not completely cataloged (i.e., some government documents, detailed microfilm contents, special collections, University archives, and maps). The Health Sciences Library catalog is accessible on the Library home page at *www.stonybrook.edu/library.*

The University libraries have a wide array of leased online resources including subscriptions to more than 300 electronic databases, books, and archives, and 10,000 electronic full-text journals. Computer workstations are located throughout the library's facilities. Web access is available to most of its specialized databases from all personal computers using on-campus ISPs. Access is available via proxy server to off-campus users who can log in with Stony Brook ID. Instructions for using the databases are available at the Reference Department, Instructional Computing Center, DoIt Web site, and most library service desks.

The library sponsors or co-sponsors author readings, lectures, tours, concerts, and exhibits throughout the year. Check the library or University home page or other campus newsletters for dates and events.

Brochures, handouts, and information sheets explaining library policies, how to use the library, how to access electronic resources, how to do research, and where books, magazines, and services are located are available in the Central Reading Room on the first floor or in Circulation Services on the third floor of the Melville Library. Additional detailed information on library services, activities, offices, collections, and building maps is also available online.

The Melville Library, a smoke-free building, is generally open from 8:30 a.m. to midnight Monday through Thursday; 8:30 a.m. to 8:00 p.m. on Friday; 10:00 a.m. to 6:00 p.m. on Saturday; and noon to midnight on Sunday. Branch library hours may be

shorter or longer. Study hours are usually extended just before final exams. When classes are not in session and during the two Summer Sessions, the hours are usually 8:30 a.m. to 5:00 p.m., Monday through Friday; closed on weekends and evenings. Check posted times. Hours are subject to change during extreme weather conditions.

Off Campus Housing

Off Campus Housing, located in the Stony Brook Union Lobby, is available to assist students in finding off-campus living arrangements. This service includes computer-generated and bulletin board listings of available facilities, tenant information, tips for renters, listings of short-term and interim housing, bed and breakfast, hotel and motel information, and local transportation information and maps. The office is open Monday to Friday from 10:00 a.m. to 3:00 p.m. Call (631) 632-6770 or visit the Web site with an online, interactive database at *och.vpsa.sunysb.edu.*

Ombuds Office

The services of the University Ombuds Office are available to all students, faculty, and staff. The office provides an informal, receptive place to turn for help if you are having trouble getting through a bureaucratic maze or need help resolving a dispute or problem related to your life or work at the University. All matters handled by the Ombuds Office remain confidential. Depending on the nature of the question or problem, the Ombuds Office might offer specific advice or informal mediation, provide information, or make the appropriate referral to facilitate a resolution. The Ombuds Office is also open to those who simply need someone to listen impartially and privately and to suggest a course of action. The University Ombuds Office is located in Room W-0505, Melville Library. Hours are 9:00 a.m. to 5:00 p.m. Monday through Friday. Walk-in visits are possible, but scheduled appointments are recommended. The phone number is (631) 632-9200.

The Queer Alliance

The Queer Alliance is an all-inclusive social and political group that is organized and maintained by graduate students, but also includes undergraduates, faculty, and staff. Semester events include queer-themed programming, trips to local gay and lesbian clubs, regular social hours, and publicity for ongoing local events through its extensive list-serve. For more information, e-mail *sbgrad_pride@yahoo.com.*

In addition, a Queer Studies program is being put together that involves new interdisciplinary courses, a lecture series, and networking between faculty, staff, and students.

The Wo/Men's Center offers a supportive environment for a number of therapeutic groups. For more information on programs being offered, contact the Wo/Men's Center at (631) 632-9666.

Stony Brook Union

The Stony Brook Union is a magnet for student activities, dances, concerts, movies, parties, and it is a great place to meet new friends. The Fireside Lounge on the main floor is a very visible place to become part of the action and participate in all the fun. You can find sales of posters, plants, jewelry, clothing, etc., all in the lobby area. The Stony Brook Union has seven meeting rooms, a 330-seat auditorium, a ballroom, a pool room, a video arcade, an information center, a crafts center, an art gallery, and an ATM machine.

Weekends at Stony Brook are filled with concerts, plays, movies, speakers, sporting events, and parties. Craft fairs and cross-cultural exhibits also have a strong following.

There are several places to go to for a quick bite or a relaxing lunch. The Union Deli, Papa Joe's Pizza, the Bleacher Club cafeteria, and the End of the Bridge restaurant all offer an appetizing array of possibilities and are the scene of many late-night parties.

The Stony Brook Union serves as the headquarters for many student groups. In addition, the student newspapers, WUSB-FM (90.1), the University radio station, television station and audio-visual services, and a new, 100-computer sinc site, are all located in the Union. The Inter-Fraternity/Sorority Council Office is on the lower level and the Interfaith Center's Ministries' offices and lounges are on the second floor, offering Baptist, Catholic, Islamic, Jewish, and Protestant services and activities that are open to all. Religious and personal counseling services for students of these and other denominations are also provided through the Interfaith Center. For more information about the Center, please call (631) 632-6565.

Hours of Operation

During the fall and spring semesters the Stony Brook Union is open Monday through Wednesday, 8:00 a.m. to 1:00 a.m.; Thursday, 8:00 a.m. to 2:00 a.m.; Friday, 8:00 a.m. to 3:00 a.m.; Saturday, 10:00 a.m. to 3:00 a.m.; and Sunday, 10:00 a.m. to 11:30 p.m. During recesses and intersession it is open Monday through Friday, 8:00 a.m. to 5:30 p.m. and is closed New Year's Day, Easter Sunday, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas Day.

Note: Union hours are subject to change. For more specific building hours information call (631) 632-6830.

Student Activities Center

The Student Activities Center (SAC) opened in 1997 and forever changed the way students, faculty, and staff interact on campus. Everyone seems to come to the Center at some part of the day, for either a meal, a program, an exhibit, a meeting or at least one activity. From the soaring windows in the two-story dining hall that overlooks the Academic Mall, you are treated to a panoramic view stretching from the Administration Building to the east, and Earth and Space Sciences to the west.

Services offered within the Center include a wireless network (first floor), the Seawolves Marketplace convenience store; U.S. Post Office; a full-service bank with ATMs; an auditorium that seats 550; nine meeting rooms; offices for clubs and organizations; a ticket office; several lounges equipped with ports; and the Eugene Weidman Wellness Center, where you can work out. There are lockers available for commuters in the lower level. Administrative offices for the Dean of Students and Commuter Student Services are located on the second floor, as are offices for Student Activities, Reservations, and Facilities/ Operations managers. There is also a building manager and information desk next to the entry doorway nearest the dining hall, off the mall.

Recently, the Student Activities Center underwent considerable expansion and enhancement, adding a student lounge with gaming tables and food snacks. Responding to the campus' need for more programming space, there are two additional, large ballrooms rooms for 350 to 700 people. An expanded Wellness Center is on the third floor with showers and locker rooms, as well as a variety of exercise equipment. A glass, street-level art gallery overlooks scenic landscaping, and is located adja-

cent to the lobby. There are also spaces dedicated to supporting student life on campus through co-curricular development and leadership training.

The Department of Campus Recreation Wellness Center

Stony Brook's new Wellness Center, located on the third floor of the Student Activities Center in Room 307, is the perfect place to start a healthy lifestyle. Amenities include locker rooms, shower facilities, cardiovascular equipment, weight training machines, strength training equipment, free weights, physioballs, and Cardio Theater. The Wellness Center is fully equipped with cardiovascular equipment, including Life Fitness treadmills, elliptical trainers, bikes, and concepts II rowers. Each machine is outfitted with consoles into which patrons can plug their own headphones to receive audio from the eight TV stations playing in the Center. Headphones can also be purchased for $5 and $10.

Participants are offered free equipment orientation sessions on proper use of all the equipment by appointment with wellness staff. Personal training packages are also available. Your personal trainer will guide and motivate you through a series of exercises designed to achieve your fitness goals quickly. A free fitness consultation is included with the purchase of a package. The consultation includes a complete physical assessment, incorporating blood pressure, heart rate, body fat, strength endurance, and flexibility.

For those who prefer a guided workout, the Center offers a variety of fitness classes year-round. The aerobic studios are located in the basement of the Student Activities Center in Room 010. Depending on your preference, you can choose hatha yoga, step aerobics, body sculpting, mix it up!, kick boxing, boot camp, absolute core, tai chi, or pilates from a list of 20 classes. The aerobic studios are equipped with physioballs, free weights, steps, jump ropes, resistant bands, body bars, and body wedges, making it the perfect haven for fitness classes.

"Wellness" is a broad term for the concept of self-improvement aimed at achieving a healthful, fulfilling lifestyle. Its components are the areas of the Wellness Wheel: physical, emotional, intellectual, environmental, cultural, occupational, spiritual, and social. The Center offers seminars and hands-on workshops covering these eight dimensions of wellness throughout the year. Seminars are offered on meditation, time management, nutrition, stress management, yoga therapy, strength training, and other wellness topics. The Center also offers programs such as Dance for Wellness, Reiki Healing Circles, Taiko Drumming, Tai-Chi, Back Care, Body Wedge, and Lunch & Learn topics.

To view the Wellness Center's class schedule and facility information check out the Campus Recreation Web site at *http://studentaffairs.stonybrook.edu/recreation*. For more information call 632-7209.

Student Activities

The Office of Student Activities is the primary focal point for the planning, coordination, and implementation of a broad range of social, recreational, educational, cultural, leadership, and developmental programs. The office consists of four functional areas: Student Activities, which includes Clubs and Organizations; Fraternities and Sororities; Leisure Programs and Art Gallery; and Student Media. The organizational structure compliments this mission: to provide student programs and services, to foster student development, to interact and collaborate with all facets of campus life for activities and program development, and to provide experimental opportunities for the acquisition of skills.

Student Activities provides a variety of programs and services to facilitate the co-curricular and personal development of Stony Brook students and the campus community. Students experience opportunities for leadership development and personal growth. The Activities staff offers assistance in organizational development and program advisement to more than 240 student clubs and organizations and 32 fraternities and sororities. Staff members work with students on the event planning process, and help clubs and organizations with program advisement, budget issues, space reservation, technical requirements for student-sponsored events, evaluation of events, block booking, meeting space, recognition for new clubs, and the annual registration process for student groups. The office coordinates many traditional campus-wide programs, such as Campus Life Time, Opening Week Activities/Chill-Fest, Student Activities Fairs, Roth Regatta, and the Commencement speaker selection process. Activities staff collaborate with other departments to implement other major campus programs such as Homecoming, Diversity Day, Strawberry Festival, and many more.

Leisure Programs

In the Stony Brook Union Crafts Center courses, students learn about ceramics/pottery, painting, fiber arts, photography, and bartending. A new Art Gallery is now located in the Student Activities Center. The Gallery sponsors various exhibits featuring student art and nationally known artists. The shows have been very well attended by faculty, students, staff, and the outside community. Student Activities offers students and community members opportunities for self-development and self-expression through the arts.

Student Media

High-quality non-commercial FM radio is provided for the campus and community, reflecting a broad spectrum of musical, informational, and educational programming 24 hours a day, seven days a week on WUSB 90.1. The department sponsors independent projects and internships. The Student Media area coordinates fundraisers for the radio station and advises student media groups, including newspapers, the yearbook, and closed-circuit TV. There are several newspapers on campus: *Statesman*, *Stony Book Press*, *Shelanu*, *En Accion*, *Black World*, and *E-Zine*. There is also a full-service TV station on campus where students are able to learn about the TV industry and produce shows.

Student Health Service

The Student Health Service, located on the first floor of the Infirmary Building, provides health care to all registered students. For detailed information, please refer to the Student Health Service section in the next chapter on Financial and Residential Information.

Veterans Affairs

The Office of Veterans Affairs (VA), located in Room 347 of the Administration Building, offers services in applying for VA educational benefits. All veterans, veterans' dependents, and active duty personnel may utilize these services. Stony Brook University is approved for the education of veterans, service members, and dependents of veterans eligible for benefits under the programs of the Veterans Administration.

New veteran students should report to the Office of Veterans Affairs at the time of application to the University.

All veterans need to report after registration for each new semester. Since benefit allowances and VA policies and procedures are subject to change, veteran students should maintain regular contact with the office at (631) 632-6700 or *OSA_VETS@notes.cc.sunysb.edu.*

The office also provides certification and tuition deferment services. For additional information or to schedule an appointment, visit the Web site at *www.sunysb.edu/stuaff/vets* or call the office at (631) 632-6700.

Information regarding VA benefits, including eligibility, payment information, remaining entitlement, or the address of the nearest regional office is available through the VA at 1-888-GIBill-1 (1-888-442-4551).

Transfer Credit from Military Service

For information about transfer credit from military service school, please make an appointment with the Office of Admissions/Transfer.

Military service school courses will be evaluated with reference to the recommendation of the American Council on Education when official credentials/transcripts have been presented by the student to the Office of Admissions. Such recommendations are not binding upon the University. In no instance may any of the hours of credit be substituted for specific courses, but they may be substituted for electives.

Students who have successfully completed basic training in the armed forces may receive semester hours of elective credit by presenting a DD214, DD295, a copy of a Community College of the Air Force transcript, or a certificate of training to the Office of Admissions.

Writing Center

The Writing Center is the tutorial component of the Program in Writing and Rhetoric, and it provides free, individual mentoring for writing to all members of the Stony Brook University community. The tutors at the center work with a wide range of students, staff, and faculty, and they are sensitive to the needs of native English speakers as well as the concerns of people whose primary language is not English. Tutors are trained to work with all aspects of writing and will address a broad range of writing issues such as planning, organizing, revising, and editing. Although they cannot edit or proofread writers' work for academic honesty reasons, they do model and practice strategies of effected editing. The Writing Center offers appointments and drop-in sessions (although it cannot guarantee that a tutor will always be available for the latter), and the sessions usually last no more than 50 minutes. Please call (631) 632-7405 for the current schedule and an appointment, or visit *www.stonybrook.edu/writingcenter.* The office is located in L77 of the Old Life Sciences Library.

Financial and Residential Information

Financial Information

Tuition and Fees

All bills are due and payable (unless properly deferred by guaranteed financial aid) within 30 days of registration or by the published due date on the billing statement, whichever is sooner. Tuition and fees are estimated as of May 2004 and are subject to change without notice.

Application Fee $60

Tuition

Full-Time Graduate Students
G1 or G3—12 credits

	First Semester
NY State resident	$3,450
Non-resident	5,250
	Second Semester
NY State resident	$3,450
Non-resident	5,250
	Academic Year
NY State resident	$6,900
Non-resident	10,500

Full-Time Graduate Students
G2 or G4—9 credits

	First Semester
NY State resident	$2,592
Non-resident	3,942
	Second Semester
NY State resident	$2,592
Non-resident	3,942
	Academic Year
NY State resident	$5,184
Non-resident	7,884

Part-Time Graduate Students
G1, G2, G3, G4, and G5—1 credit

NY State resident	$288 *per semester credit hour*
Non-resident	$438 *per semester credit hour*

Full-Time Medical Students

NY State resident	$10,400 per semester
Non-resident	$17,950 per semester
NY State resident	$20,800 per year
Non-resident	$35,900 per year

Full-Time Dental Students

NY State resident	$6,900 per semester
Non-resident	$13,600 per semester
NY State resident	$13,800 per year
Non-resident	$27,200 per year

Activity Fee

	First Semester
Full-time graduate student (except professional)	$22.00
Part-time graduate student	7.00
Dental student	37.50
	Second Semester
Full-time graduate student (except professional)	$22.00
Part-time graduate student	7.00
Dental student	37.50
	Academic Year
Full-time graduate student (except professional)	$41.00
Part-time graduate student	12.50
Dental student	75.00

Comprehensive Fee

	Fall Semester
Full-time graduate student	$242.50/term
composed of:	
College Fee	12.50/term
Infirmary Fee	100.00/term
Transportation Fee	40.00/term
Technology Fee	100.00/term
Part-time graduate student composed of:	
College Fee	$.85 per credit
Infirmary Fee	9.00 per credit
Transportation Fee	4.00 per credit
Technology Fee	10.00 per credit
	Spring Semester
Full-time graduate student	$242.50/term
composed of:	
College Fee	12.50/term
Infirmary Fee	90.00/term
Transportation Fee	40.00/term
Technology Fee	100.00/term
Part-time graduate student composed of:	
College Fee	.85 per credit
Infirmary Fee	9.00 per credit
Transportation Fee	4.00 per credit
Technology Fee	10.00 per credit

Lost Identification Card	**$25.00**
Late Registration Fee	**$40.00**
Transcript Fee	**$5.00**
Returned Check Fee	**$20.00**
Late Payment Fee	**$30.00/up to $90.00**
Add/Drop Fee	**$20.00**
Health Insurance Fee	**Various**

Billing Statements and Account Balances

After registering, all students will be sent a billing statement for tuition and fees with instructions for making payment. If the student does not receive a billing statement within 30 days after registration, it is the student's responsibility to contact the Student Accounts Office at (631) 632-2455 for a bill and pay the full balance by the due date.

Students with outstanding balances will receive multiple statements throughout each semester. Each billing statement will list the amount due to the University. Tuition, fees, and other University charges assessed on each billing statement will be due in full by the due date appearing on your statement. Unpaid charges from the previous statement will be brought forward and additional charges, payments, and credits will be shown.

The billing statement also will show and subtract any authorized deferments in the calculation of the amount due. These include student loans, TAP awards, and tuition scholarships. Students must have proof of approved aid, waivers, or scholarships in order to properly defer payment. Without satisfactory evidence to defer, students are expected to pay charges up front and wait for reimbursement when the aid, waiver, or scholarship funds are actually received. Students should apply early for financial aid they expect to use to pay their University bill, and are encouraged to join the Time Option Payment Plan.

All students are responsible for making sure that a correct address is on file and they must inform the Registrar's Office of any change of address. Failure to receive a bill due to an incorrect address will not be accepted as a reason for waiving late payment fees.

Failure to pay the amount due by the due date will result in an automatic assessment of the incremental late payment fee of $30 up to a maximum of $90 per semester. Pending financial aid will not be accepted as a reason to waive late payment fees.

Payment of Tuition and Fees

Payments made by check or money order must be made payable to Stony Brook University. Payment can be mailed to P.O. Box 619, Stony Brook, NY 11790, or made in person at the Bursar's Office in the Student Services

Lobby in the Administration Building. Credit card Web payments can be made through the Solar System (*www.stonybrook.edu/solarsystem*). You will need the Stony Brook ID number and password to access the payment option. After logging in, click "For Students, Financial Services, Make a Payment." Complete the credit card information, and the payment will be posted to the student account. Any check that fails to clear is subject to a $20 handling fee, and may be subject to a $30 late payment fee.

All payments should include your Stony Brook ID number for prompt and proper credit to your account. Mailed payments must be postmarked by the due date to avoid the late payment fee. Students are encouraged to pay by mail or by the Solar System.

All New York State resident graduate students receiving support from the University must apply for TAP, regardless of eligibility. New York State resident graduate students must receive a valid TAP award certificate or TAP denial letter, or the scholarship will be reduced by the maximum amount.

The Student Accounts Office offers the Time Option Payment Plan, which allows for the payment of your student account on a monthly basis throughout the semester. This plan is not a loan, so there is no credit check, nor interest or finance charges. The only cost is a processing fee to help defray the administrative expenses of the program. Enrollment forms, which are found in the Dollars and Sense Guide, are sent with the bills and also are available in the Student Services Center. Call (631) 632-2455 for more information.

Delinquent Accounts

Students with an outstanding balance on their accounts are not eligible to register at the University or participate in room selection. No student may receive a degree, certificate of completion, or transcript until all charges due to the University or any of its related divisions are paid in full. Delinquent accounts may be transferred to private collection agencies or the New York State Attorney General's Office for collection, and will be subject to additional interest and/or collection fee charges.

Deferments

Students receiving awards provided by the State of New York, managed by the University, or payable to the University, may utilize deferments equal to the amount of the award. Only current awards are deferrable; only tuition, room, and board charges are deferred. Deferments include:

1. All campus-based financial aid programs with the exception of the Federal Work Study Program and Student Employment
2. Tuition Assistance Program Awards
3. Federal Pell Grants
4. Federal Stafford Loans (Subsidized and Unsubsidized)
5. Veteran's educational benefits
6. Vocational rehabilitation benefits
7. Private, public, or industrial scholarships, grants, internships, and loans (including foreign government scholarships)

Deferments are available only upon completion of all necessary paperwork and receipt of valid documentation.

NYS Tap awards may be deferred against your bill if you have received an award certificate from HESC listing SUNY Stony Brook. To use your subsidized or unsubsidized Stafford loan as a deferment, you must return the Master promissory note to HESC in Albany. Teacher Waiver certificates, Tuition Eligibility forms, and State tuition waivers must be received by the Student Accounts Office before the end of the second week of classes. Waivers and certificates must be approved by all necessary parties and not expired.

Withdrawals and Tuition Liability

Tuition

A student who is given permission to cancel his or her registration or who is withdrawing from classes shall be liable for payments of tuition and all fees in accordance with the appropriate tuition liability schedule:

Fall and Spring Academic Semester
Tuition Liability Schedule

Tuition and Fee Liability during:

	Tuition	Fees
1st week	0%	0%
2nd week	30%	100%
3rd week	50%	100%
4th week	70%	100%
5th week	100%	100%

Six-Week Summer Term
Tuition Liability Schedule

Tuition and Fee Liability during:

	Tuition	Fees
1st week	0%	0%
2nd week	70%	100%
3rd week	100%	100%

Tuition Liability Schedule for fall 2004
Liability Period from:

Registration Withdrawals during:

	Tuition	Fees
before 9/5/04	0%	0%
9/6/04 - 9/12/04	30%	100%
9/13/04 - 9/19/04	50%	100%
9/20/04 - 9/26/04	70%	100%
after 9/27/04	100%	100%

Note: The first day of classes as scheduled by the campus shall be deemed to be the first day that classes are offered, as scheduled by the academic calendar.

After 0% liability, tuition will be prorated according to the schedule above, and all fees are due in full. After 100% liability, a student is liable for tuition and all fees in full. Students who register for courses and who do not file the appropriate withdrawal, or do not drop before the end of the fourth week of classes, are liable for their full charges.

Students who decide not to attend after registering must formally cancel their registration at the Registrar's Office. All refunds or adjustments of charges are based on the date the withdrawal occurs, not on the date of the last class attended. If students are unable to cancel or withdraw in person, written requests may be sent to the Office of Records or faxed to (631) 632-9491. Students are advised to retain a copy of the withdrawal letter for the Student Accounts Office.You should be aware that even after an official withdrawal, you may be subject to financial liability according to the published tuition liability schedule.

There is no tuition liability for a student who withdraws by call to active military service before the end of an academic term. This only includes courses in which he or she does not receive academic credit.

Non-attendance of classes does not classify as an official withdrawal, and does not relieve the student of his or her financial obligation, or entitle the

student to a refund, and non-payment does not constitute an official withdrawal from the University.

Housing

All requests to cancel housing and refund-related fees must be made in writing to Division of Campus Residences, Mendelsohn Quad, Stony Brook University, Stony Brook NY 11794-4444. For information on housing cancellation deadlines, call the Division of Campus Residences at (631) 632-6750.

West Campus Meal Plan Office

The office is located in the Stony Brook Union, Suite 250, and addresses all issues related to West Campus meal plans and dual meal plans (for HSC students only). Hours are Monday to Friday, from 8:30 a.m. to 4:30 p.m.; the phone number is (631) 632-6517.

To obtain a new ID card or replace an existing card, go to the Administration Building, Room 103. To add money to a Resident or Commuter Meal Plan, visit *www.campusdining.org*. This site also allows students to report lost cards, check balances, review spending history, and the site explains the different meal plans that are offered.

To address a vending issue or problem related to an ID card not working in the Cash-to-Chip machines and/or laundry equipment, go to the ID Office, Administration, Room 103.

Student Activity Fee

The Graduate Student Organization will grant a full refund of the student activity fee to all students who withdraw within the first week of classes. No refunds will be granted after the first week of classes. Any student can apply for a waiver.

Note: The first day of classes shall be considered the first day of the semester, quarter, or other term; the last day of finals week shall be considered the end of the semester.

Financial Assistance

The Office of Financial Aid and Student Employment assists graduate students to take full advantage of their financial aid opportunities by providing information about available grants, work opportunities, and student loan programs. Financial assistance is available as a resource to help students and their families meet educational costs. Students and their families are responsible for all educational expenses and for completing all required financial aid processes. To receive maximum financial aid consideration, students should carefully follow the instructions on all forms and should strictly adhere to deadline dates.

Application Forms

In order to begin the financial aid application process, the student must complete the *Free Application for Federal Student Aid* (FAFSA). The application should be mailed to the federal processor in the envelope provided before the deadline date. It is important that the application include the following information: Stony Brook's Title IV school code (002838) and the correct name of the institution (SUNY Stony Brook).

Upon receipt of the FAFSA, the federal processor will send income and demographic data pertaining to New York State residents to New York State Higher Education Services Corporation (HESC), initiating the application process for the Tuition Assistance Program (TAP). HESC will then send applicants a pre-printed Express Tuition Assistance Program Application (ETA). HESC will make certain assumptions based on the information filed on the federal application, so the applicant should inspect the ETA carefully and make any required changes. It is necessary to include Stony Brook's TAP code (5430 for graduate students) on the application and to sign and return it promptly in the envelope provided.

Application Process

Upon receipt of the completed FAFSA (sent electronically by the federal processor), the Office of Financial Aid and Student Employment will determine the student's eligibility for financial aid based on the cost of attendance and expected family contribution as indicated on the Student Aid Report (SAR). The financial aid office will send an award notice describing the financial aid programs and amounts for which the student is eligible.

Financial Aid Application Deadlines

Programs	Deadline to Apply
Federal Work Study	March 1*
Federal Perkins Loan	March 1*
Tuition Assistance Program (TAP)	May 1

**The FAFSA must be date-stamped by the federal processor on or before March 1.*

Financial Aid Eligibility

Financial aid eligibility is based on financial need. Financial need is the difference between the "Expected Family Contribution" and the "Estimated Cost of Attendance" (also referred to as the "Student Budget"). The "Expected Family Contribution" (EFC) is the result of the income information that a student provides on the FAFSA, calculated with a formula determined by the U.S. Congress. The EFC is listed on the Student Aid Report that is sent to applicants by the federal processor after they file the FAFSA.

The "Estimated Cost of Attendance" includes estimates for tuition, fees, room, board, books, transportation, and personal expenses. Direct costs are paid directly to the University; indirect costs will vary by student.

Estimated Student Expenses 2003-2004 (NY State Residents)

	Full time/On campus	Full time/Off Campus
Direct Costs:		
Tuition	$6,900	$6,900
Fees	526	526
Room	4,718	
Board	2,740	
Total Direct Costs:	$14,884	$7,426
Indirect Costs:		
Books	$900	$900
Transportation	500	2,080
Personal	1,000	9,280*
Total Indirect Costs:	$2,400	$12,260
Total Cost:	$17,284	$19,686

(Out-of-state graduates add $3,316)

***Includes a $8,280 allowance for room and board**

Financial Aid Programs

Financial aid is divided into three basic categories: institutional aid, federal and state aid, and external support. There are three types of aid: grants, loans, and employment opportunities. Grants, which include scholarships and fellowships, do not have to be repaid. Loans carry some form of interest payment and must be paid back to the lender. Employment opportunities afford the student the chance to earn an income while attending school.

Institutional Aid

University Tuition Scholarship

University tuition scholarships may be awarded to cover all or partial tuition charges. Full scholarships cover the cost of the University-required full-time credit load at the rate charged to New York State residents except for (1) international students, (2) first-semester out-of-state students, and (3) U.S. nationals or resident alien students without New York State residency who have been granted an exemption by the Graduate School because obtaining residency would be impractical.

For students in categories (1), (2), and (3), a full tuition scholarship covers the cost of the University required full-time credit load charged at the out-of-state rate.

Out-of-state students receiving tuition scholarships who are U.S. citizens or permanent residents must apply for New York State residency during their first semester of graduate study at Stony Brook. Students who fail to do so will be liable for the difference between the in-state and out-of-state rates.

Partial tuition scholarships may also be awarded. The amount of such awards may vary but are stated in the annual offer/award letter.

Graduate School Traineeships (Teaching Assistantships, Graduate Assistantships)

Graduate traineeships are awarded on a competitive basis (judged by such criteria as academic achievement, financial need, and potential for professional growth and societal contribution) by the Graduate School on recommendation of the program for one year, and may be renewed for up to four years. Effective fall 2003, a full assistantship had a minimum stipend of $11,655 for the academic year.

Research Assistantships

Appointments are for predoctoral candidates whose special training and qualifications enable them to serve as assistants to project directors or principle investigators in certain programs. In most cases the research work associated with the assistantship will also contribute to the student's thesis or dissertation. Research assistantship stipend levels vary by discipline, but are usually slightly higher than a teaching or graduate assistantship.

Graduate Council Fellowships

Graduate Council fellowships are available for exceptionally qualified incoming doctoral students. These fellowships are available to U.S. citizens and permanent residents only. GCF candidates are nominated by their respective graduate program. A Graduate Council Fellowships and Awards committee reviews and ranks candidate files. Typically, ten fellowships are available each academic year; each fellowship is renewable for up to five years. In fall 2003, a Graduate Council fellowship carried a minimum stipend of $15,828, which was comprised of a partial Teaching/Graduate assistantship and a fellowship award of $10,000. These awards also provide a full tuition scholarship and subsidized health insurance coverage.

Dorothy Pieper Merit Awards for Outstanding Entering Doctoral Students

Entering doctoral students who are nominated for a Graduate Council fellowship but whose ranking fell just below the cutoff may be offered a Pieper award. Established in 1996, the Pieper bequest seeks to acknowledge graduate student potential. The Pieper award is a one time $3,000 lump sum stipend and is in addition to any support offered by the student's program. A minimum of 15 Pieper awards will be offered each academic year.

W. Burghardt Turner Fellowships

Turner fellowships are available for qualified incoming masters and doctoral students. These fellowships are available to U.S. citizens or individuals with permanent resident status who are either Native American, African American or Hispanic American. Turner candidates are nominated by their respective graduate programs. A Turner Advisory committee reviews and ranks candidate files. Typically, 20 Turner fellowships are available each academic year. In fall 2003 a Turner fellowship for a doctoral candidate carried a total stipend of $15,828, a full tuition scholarship, and subsidized health insurance coverage. Fellowships for master's candidates carried a total stipend of $10,000 plus a full tuition scholarship. The Turner fellowships serve as a catalyst for the increased representation of African Americans, Hispanic Americans and Native Americans in Stony Brook's graduate programs. The Turner fellowship program assists and encourages its recipients in accepting and carrying out their social responsibility as future leaders and educators in their respective communities here in the United States.

Mildred and Herbert Weisinger Fellowship Award

The Mildred and Herbert Weisinger Fellowship Award is made to a graduate student in financial need so that he or she may complete a dissertation that otherwise would be delayed.

Dr. Madeline M. Fusco Fellowship for Women

The Fusco award, endowed in 1991 and supplemented in 1994, is awarded annually to a minority or woman graduate student who is completing a dissertation and has demonstrated financial need. Nominee files are submitted by each graduate program. The Graduate Council Fellowships and Awards committee reviews and ranks all of the candidate files.

William W. and James W. Catacosinos Fellowship

The Catacosinos fellowship was established in 1979. It may be awarded annually to the graduate student who has made the most outstanding contribution during the preceding year in the field of computer science, including applications of techniques of computerization in any academic discipline. The fellowship carries an academic year stipend and provides a full tuition scholarship. Candidates are nominated by their graduate programs.

Pope Fellowship in Italian Studies

The Pope Fellowship is awarded each year by the Center for Italian Studies to a student enrolled in the Italian Graduate Program who is in need of financial assistance and has an outstanding academic record. Fellowships

may be renewed for up to three years and are in the amount of $1,500 per year. For further information, contact the Center for Italian Studies.

Sea Grant Scholar Awards

Sea Grant Scholars receive a stipend that permits the student to work directly on Sea Grant-funded research in coastal zone management, marine environmental studies, coastal oceanography, and related fields. The stipend is comparable to that of a graduate assistantship and is renewable for one additional year under the Sea Grant Thesis Completion Award.

Howard Hughes Medical Institute Biomedical Research Fellowship

The Howard Hughes Medical Institute awards funding to graduate students working in the field of biomedical science. Awards are granted to support original research in the application of scientific knowledge to the alleviation of disease and for the promotion of health. This award is made to graduate students on the recommendation of their program.

Federal and State Aid

Externally Funded Graduate Fellowships

Fellowships are available in various fields from agencies and organizations including the National Science Foundation, U.S. Department of Energy, National Aeronautics and Space Agency, and U.S. Environmental Protection Agency. They are applied for directly by the graduate student and awarded by the funding agency. Some agencies require applicants to be citizens or nationals of the United States. Specific information and applications for these fellowships can be obtained online or on the Graduate School Web site.

Veterans Educational Benefits

Students who are eligible for veterans benefits should obtain an application form from the Office of Veterans Affairs, Room 347, Administration Building, (631) 632-6700. Students are advised to contact the Office of Veterans Affairs concerning veterans benefits as soon as possible, where they can receive assistance in applying for benefits.

Federal Work Study

Federal Work-Study (FWS) provides on-campus employment opportunities for eligible matriculated students. The amount of the award is based on the student's financial need, the availability of funds to the campus, the number of hours the student can work per week, and the current pay rate. The minimum pay rate for jobs is currently $5.15 per hour. Specific details regarding employment opportunities can be accessed on the Web at *www.sunysb.edu/solarsystem.*

Federal Stafford Loan—Subsidized

The Federal Stafford Loan (Subsidized) is available to graduate and undergraduate students based upon demonstrated financial need. The federal government pays the interest while the student is enrolled at least half time and for six months after leaving school. Graduate yearly limits are $8,500 with a total cumulative limit of $65,000, including undergraduate loans. The maximum rate of interest charged is 8.25 percent.

Federal Stafford Loan—Unsubsidized

The Federal Stafford Loan (Unsubsidized) is available to graduate and undergraduate students unable to demonstrate financial need, subject to the student's enrollment, budget, other financial aid, and expected family contribution. Interest starts accruing while the student is in school. Graduate students may apply for $10,000 for each year of graduate study. With the exception of interest accrual, the terms and conditions are the same as for the subsidized Stafford Loans.

Federal Perkins Loans

The Federal Perkins Loan carries a 5 percent interest rate and is deferred until nine months after graduation (or whenever the student falls below six credits per semester). Students who have filed applications prior to the specified deadlines and who qualify for awards will receive award notices from the Office of Student Financial Aid Services. Awards at Stony Brook range from a minimum of $200 to a maximum of $3,800.

Tuition Assistance Program (TAP)

This state-funded grant is available only to New York State students who meet U.S. citizenship and residency requirements for attendance at accredited New York State campuses. It provides tuition assistance for matriculated graduate students enrolled full time. TAP award amounts are based on New York State taxable income. The yearly awards range from $75 to $550 for graduates and may be received for up to eight semesters. Students must complete the FAFSA application forms available at the Financial Aid Office.

U.S. Department of Education Fellowships: Jacob K. Javits Fellowship

Fellowships are available in selected fields of study of the arts, humanities, and social sciences. Individuals who at the time of application have not yet completed their first full year of doctoral or MFA study or are entering graduate school for the first time in the next academic year are eligible. Applicants must be U.S. citizens or nationals, permanent residents of the U.S., or citizens of any one of the Freely Associated States. Subject to the availability of funds, a fellow receives the Javits fellowship annually for up to the lesser of 48 months or

Standard of Satisfactory Academic Progress Only for the Purpose of Determining Eligibility for Student Aid

Semester Calendar
All Graduate-Level Programs

Before being certified for this payment	1	2	3	4	5	6	7	8
A student must have accrued at least this many credits	0	6	12	21	30	45	60	70
With at least this grade point average	0	2.0	2.5	2.75	3.0	3.0	3.0	3.0

completion of the degree. In fiscal year 2003, the maximum stipend is $21,500.

Graduate Assistance in Areas of National Need (GAANN)

GAANN fellowship grants are held by several programs. Although students are not eligible to directly apply for this grant, those interested should contact their academic department for information. The fellowship provides a stipend in the amount of the individual's financial need not to exceed $21,500 (in fiscal year 2003) and provides an institutional payment that funds tuition, fees, and related costs associated with the fellow.

New York State Residency Requirement

To satisfy residency requirements, the student must be a legal resident of New York State. Legal residence means that the student currently resides in New York State and intends to make the state his/her permanent home. Living in New York State solely to attend a college or other post-secondary institution does not, in itself, establish legal residence.

For grant and scholarship programs such as TAP, which require award recipients to be New York State residents, the student must be a legal resident of New York State for at least 12 months before the term for which assistance is sought. Non-residents who begin full-time study in New York State during their first year of residing in New York State are not eligible for state-sponsored student aid, even thought they may have resided in New York State for 12 or more months.

Satisfactory Academic Progress

In order to receive TAP payments, students must comply with the Standards of Academic Progress of the NY State Education Department. These regulations provide that students meet minimum academic achievement requirements in order to receive payment of awards. Good academic standing consists of two elements:

1. Satisfactory academic progress: A requirement that students accumulate a specified number of credits and achieve a specified grade point average each term of the award.
2. Pursuit of program: A requirement that a student complete (pass or fail) a certain percentage of credits each term of an award.

The chart to the previous page provides a detailed analysis of the State Education Department's requirements. Note that the minimum achievement standards for payment of awards are less demanding than those established by the University for good academic standing.

A student who fails to meet these minimum standards for any one term will be ineligible to receive an award payment for the following term. Each applicant, if eligible, can be approved for no more than one waiver of the minimum achievement requirements during his or her career as a graduate student. Students who fail to meet these requirements will receive notification in the mail as to their next appropriate course of action.

Information

For further information about Stony Brook, visit or call the Office of Financial Aid and Student Employment at (631) 632-6840. The office is open Monday, Wednesday, Thursday, and Friday from 8:30 a.m. to 4:00 p.m. and Tuesday from 10:00 a.m. to 7:00 p.m. when classes are in session. Appointments are available.

For further information from agencies other than the University, call the Federal Student Aid Information Center at 1-800-4FEDAID for FAFSA questions (*www.fafsa.ed.gov*) and the Higher Education Services Corporation at 1-888-NYS-HESC for TAP and loan questions (*www.hesc.com*).

Residential Information

On-Campus Housing

New graduate and family applicants who apply by May 15 are guaranteed housing. Family housing is not guaranteed, but is subject to availability. Family applicants are encouraged to travel alone until family housing is available.

There are a variety of on-campus living arrangements for single graduate students and couples with or without children. The University apartment complexes offer double rooms, studios, and one-, two-, three-, and four-bedroom apartments. (Most new students should expect to be assigned a room with a roommate.)

All housing assignments are made on a first-come, first-serve basis, according to the date the housing application and advance deposit are received by the Division of Campus Residences. Application instructions will be distributed to all new students by their academic departments shortly after acceptance to the program. Space is limited and request of room type cannot be guaranteed. Students are encouraged to apply at the earliest possible date. For more information, call the Division of Campus Residences at (631) 632-6750.

University Apartments

University Apartments provide housing for graduate students at Stony Brook. Apartments are composed of three separate complexes: the Harry F. Chapin Apartments, Arthur A. Schomburg Apartments, and West Apartments. These housing units provide apartment-style living for families and graduate students. All apartments are fully furnished, and selected apartments have been partially adapted to accommodate individuals with mobility-related challenges.

Chapin consists of 12 separate buildings, with a total of 240 apartments. The one- and two-bedroom apartments are assigned mainly to families. The two-bedroom apartments typically house two couples, one in each bedroom, or four single students. Three-bedroom apartments house single students, each with two per bedroom. Several three-bedroom units have been renovated into four-bedroom apartments, each with single occupancy rooms. Three-bedroom apartments have two full bathrooms; two-bedroom apartments have one and one-half bathrooms. All apartments have a kitchen, a dining area, and a living room. No storage facilities are available for furniture or other personal property. Chapin is located on East Campus near the Health Sciences Center and University Hospital.

Schomburg consists of two residential buildings and a separate commons building for the community center. There are a total of 72 apartments consisting of one- and four-bedroom apartments. One-bedroom apartments are reserved for couples without children. Four-bedroom apartments house four single students. The administrative office, residents' mailboxes, laundry facilities, and a general-purpose lounge are all located in the community center. The Schomburg apartments are adjacent to Kelly Quad and near the LIRR train station and campus bus routes. (Please note that it is very difficult for new applicants to obtain an assignment in the Schomburg apartments.)

The West Apartments house a mix of

**Fees totaling 3.5 percent to 4 percent will be deducted from the loan proceeds by the lender.*

upper-division undergraduates and graduate-level students. Single- and double-occupancy bedrooms are available. All units are fully furnished and are equipped with air conditioning/heating units. Administrative services and community space are provided by the Schomburg Commons.

Many of the graduate residents of University apartments are from countries outside the United States. This rich mix of diverse cultures provides students with a unique opportunity to experience international living.

Eligibility

Eligibility is limited to the following categories (not in any priority order):

1. Families with children are eligible to live only in the Chapin Complex.
2. Only married couples, approved domestic partnerships, and single heads of households may live in the one- and two-bedroom units.
3. Single graduate students

Apartment Rental Rates

Apartment rates vary according to apartment size and the number of occupants. A $200 nonrefundable room deposit is required to ensure a space at the time of application.

Rents include utilities, cable TV including HBO, and telephone service. All charges are subject to change without notice. The monthly rents pertaining to the various apartment/room arrangements for 2003 to May 31, 2004 are as follows.

Chapin Apartments

Four-bedroom	$470-485 per bedroom
Full one-bedroom	$899
Full two-bedroom	$1,378
Two-bedroom, shared (each bedroom)	$684
Three-bedroom, shared	$265
A or C room shared	$316 per bed
B room shared	$297 per bed

Schomburg Apartments

Full one-bedroom	$1,045
Four-bedroom, shared (each bedroom)	$523

Air-conditioned rooms are available at an additional monthly fee.

Facilities

Each bedroom in the apartments comes fully equipped with a digital phone with free, unlimited incoming and on-campus calling and phone mail. Additional services, e.g., off-campus, long-distance, and international calling, are also available. Ethernet connectivity is available in Chapin, Schomburg, and West. Modems are available in Chapin. Costs for these services are in addition to the basic monthly charge for phone service included in the monthly rent. The telephone lines also provide a closed-circuit TV connection through which residents receive cable TV service including HBO.

To provide further convenience for residents, pay phones are located in each of the laundry rooms.

Blue-light telephones, for use in emergencies, are located all across campus. The blue-light phones in Chapin are next to the bus stop and outside the complex office. In Schomburg, the blue-light phones are next to the community center and between buildings A and B. These phones can be used only to make on-campus calls.

Parking in the lots for Chapin and Schomburg apartments is reserved for residents' vehicles only. All authorized vehicles must display a parking sticker.

Coin-operated laundry machines are located in buildings B, C, E, and K in Chapin and in the commons building in Schomburg. Laundry rooms are accessible to residents at all times.

Mail is delivered daily, except on Sundays and holidays. The Stony Brook Post Office delivers mail directly to the mailboxes located in the complex.

The Chapin Community Center and the Schomburg Commons are available for use by all residents of the University Apartments for parties or other social, cultural, and educational events.

Day care centers are located near the Chapin apartments. Residents may also make baby-sitting arrangements among themselves.

Off Campus Housing

Off Campus Housing provides information concerning rentals of rooms, apartments, and houses in the local area. All landlords listing property with Off Campus Housing must sign a statement assuring nondiscriminatory practices; listings do not become available until such assurance is received. Off Campus Housing and the University may not become involved in landlord-tenant disputes.

The common price per month for a furnished room is $350 to $500. Kitchen privileges are often included in this price. Rooms available in houses rented by other students are also listed. Arrangements can sometimes be made to share a complete house for $350 to $600 per person, per month plus a percentage of the utilities cost. Apartment listings cover those available in standard apartment building complexes and those available in private homes. The usual rental rate of a studio apartment (one large room, bathroom, closets, kitchenette) in a house or apartment complex is approximately $550 to $850 per month. Apartments in housing complexes usually provide more space and privacy. A conventional one-bedroom apartment, including living room, dining room, kitchenette, bathroom, and closet space, usually ranges in price from $650 to $950 per month. Utility costs, except electricity, are often included in the price. House rentals in the area range from $800 to $1800 per month, not including utilities. The price depends on the number of rooms in the house, the condition of the house, and its distance from the campus. Other, slightly cheaper house rentals are available in towns located to the south and east of campus at a driving distance of some 20 to 30 minutes.

For more information, visit Off Campus Housing, located in the Stony Brook Union Lobby, or phone (631) 632-6770, Monday to Friday, 10:00 a.m. to 3:00 p.m.

Student Health Service

The Student Health Service, located on the first floor of the Infirmary Building, provides health care to all registered students. Included in the graduate student comprehensive fee is a mandatory infirmary fee for all part- and full-time day students, which funds the Student Health Service. Part-time evening students may use the Health Service on a fee-for-service basis. The Health Service hours are Monday to Friday, 8:00 a.m. to noon and 1:00 p.m. to 5:30 p.m. during academic semesters; 8:00 a.m. to noon and 1:00 p.m. to 4:00 p.m. during the summer and intersessions. In an emergency, students may use the Emergency Department of University Hospital on a fee-for-service basis. The mandatory infirmary fee does not cover these services. Adequate health insurance is essential to help pay for such services.

The Walk-In Clinic, staffed by board-certified physicians, physician assistants, and nurses, offers treatment for a multitude of medical and minor surgical problems. Students need only "walk in" to the Infirmary Building, register, and

they will be seen by the medical staff. Specialty services such as gynecology and dermatology are also available, but only by appointment.

Student Health Insurance Plans

There are four health insurance plans available to graduate students, depending on employment and citizenship status: the optional Student Health Insurance Plan, the Graduate Student Employee (NYSHIP) and Research Foundation Graduate Student Employee (Gerber) Health Plans, and the mandatory International Student and Scholar Health Insurance Plan.

Optional Student Health Insurance Plan

This plan is tailored to meet the needs of Stony Brook students, both part- and full-time, for U.S. citizens and permanent residents. The plan covers a broad range of medical services, on and off campus, including hospitalization, physician visits, X-rays, diagnostic testing, surgery, and emergency room. Students select their own medical providers. Costs for 2003-04 were $826 annually for students; costs for dependents ranged from $624 to $3,663 annually, depending on the period of coverage selected and the number of dependents enrolled. Open enrollment periods are at the beginning of each semester. Coverage begins either August 16 or in mid-January. Deferred payment may be made through educational loans/grants or through the Time Option Payment Plan, but enrollments must be made timely. Complete information and enrollment materials are available at the Student Health Insurance Office in the Student Health Service Building (West Campus), open Monday to Friday, 9:00 a.m. to 4:30 p.m. The phone number is (631) 632-6054. (Benefits and premium costs are subject to change each year. Estimated premiums for 2004-05 are not available at this time.)

Graduate Student Employee Plans

Graduate student employees (teaching assistants, or TAs, and graduate assistants, or GAs) are eligible to enroll in a comprehensive health insurance plan negotiated under the auspices of the Graduate Student Employee Union (GSEU). Research assistants (RAs) may enroll in the Research Foundation Graduate Student Employee Health Plan. Both plans provide substantial coverage for enrolled graduate student employees and their dependents or eligible domestic partners. Coverage includes necessary medical care for emergencies, hospitalization, office visits, prescriptions, and many other services, with discounts for dental and vision care.

The Research Foundation and State University of New York (SUNY) pay 90 percent of the cost of individual coverage and 75 percent of the cost of dependent coverage. The student pays the balance through payroll deductions. Both the SUNY and Research Foundation plans are administered through the Student Health Insurance Office. For more information, call (631) 632-6144.

To enroll in either of these health insurance plans, eligible TAs, GAs, and RAs must complete an enrollment form within 30 days of the academic appointment. Special orientations will be held during the fall semester to provide students with detailed information and enrollment forms.

International Student and Scholar Health Insurance Plan

The International Student and Scholar Health Insurance provided by the State University of New York is mandatory for all students in F-1, F-2, J-1, or J-2 status, whether part- or full-time, including those students taking only one credit. The charge is automatically billed to the student's account. Waivers can only be granted for documented comparable coverage through employment, government sponsorship, or an official exchange agreement. For more information, call the Student Health Insurance Office at (631) 632-6376.

Eligible international graduate student employees (TAs, GAs, and RAs) have insurance coverage through their University employment. F-1 TAs and GAs must enroll in the employee insurance. F-1 RAs may choose to enroll in either the employee or international student insurance. F-1 TAs, GAs, and RAs are automatically enrolled in medical evacuation and repatriation coverage. The 2003-04 cost for evacuation and repatriation was $49.75. J-1 stipend students must take the international student insurance policy; the cost of the policy will be partially underwritten by SUNY or the Research Foundation. Consult the Student Health Insurance Office with any questions regarding employment status or employee insurance. Registered students who are covered as dependents of stipended students must apply for a waiver from the mandatory international student insurance in order to remove the charge. Nonimmigrant graduate student employees will be charged for international student insurance for any months not covered by student employee insurance, including summer months.

The international policy is different from both the optional plan for U.S. citizens and permanent residents, and the graduate student employee insurance plans. It covers all necessary medical expenses up to $100,000 per illness or accident. It covers 100 percent of the first $4,000 of medical bills, provided the student's first visit was to the Student Health Center. There is a co-payment of 20 percent for the next $3,000 of medical bills. Eye examinations, dental examinations, and well-care are not covered. Students are covered worldwide except in their home country. A separate dependent policy is available directly from the insurance company, and must be applied for within the first month of arrival or start of the academic year. The fees for dependents are higher than for students; the cost for students for August 15, 2003 to August 15, 2004 was $637.50.

Premium costs and benefits are subject to change each academic year. The cost for 2004-05 is not available at this time.)

Other Expenses

Food

There are many places on campus to get a snack, grab a cup of coffee, or enjoy a full-course meal. Whether you are a resident or commuter student, hungry at 7:30 a.m. or 2:00 a.m., there is a very large selection of food options available.

Campus Dining Services offers several different meal plans to meet the needs of resident and commuter students. To sign up for a meal plan or ask questions about an existing plan, visit the Meal Plan Office, located in the Stony Brook Union, Suite 250, or call (631) 632-6517.

Students who live in residence halls or areas designated non-cooking must enroll in a resident meal plan regardless of class year or tenure. The cost for a meal plan ranges from $1,270 to $2,080 (prices are subject to change).

Students who reside in University apartments can sign up for the Apartment 500 or 250 meal plans, which are tax-exempt declining balance plans comprised of Campus Points. When a

food or beverage purchase is made, the amount is automatically deducted from the meal plan account. Students may request a receipt from any dining cashier, which lists the balance of the account. These plans are only available to apartment residents. Unused points will carry over from the fall to the spring semester, but not to summer sessions or the following academic year. An Apartment 500 or 250 can billed to your student account. You can also replenish your account in increments of $150, $250, or $500 and have it billed to your student account as well.

Commuters and apartment residents can open a Budget Meal Plan, which is a prepaid tax-exempt plan that can be opened with a minimum of $50. This plan is comprised of Campus Points and may be replenished in $25 increments.

To find out about menus, hours, or special events, call (631) 632-MEAL or visit *www.campusdining.org*.

Where to Eat on Campus

Union Deli (631) 632-6528

Bleacher Club (631) 632-6466

Papa Joe's Pizza (631) 632-6466

End of the Bridge (631) 632-6566

Student Activities Center (631) 632-1242

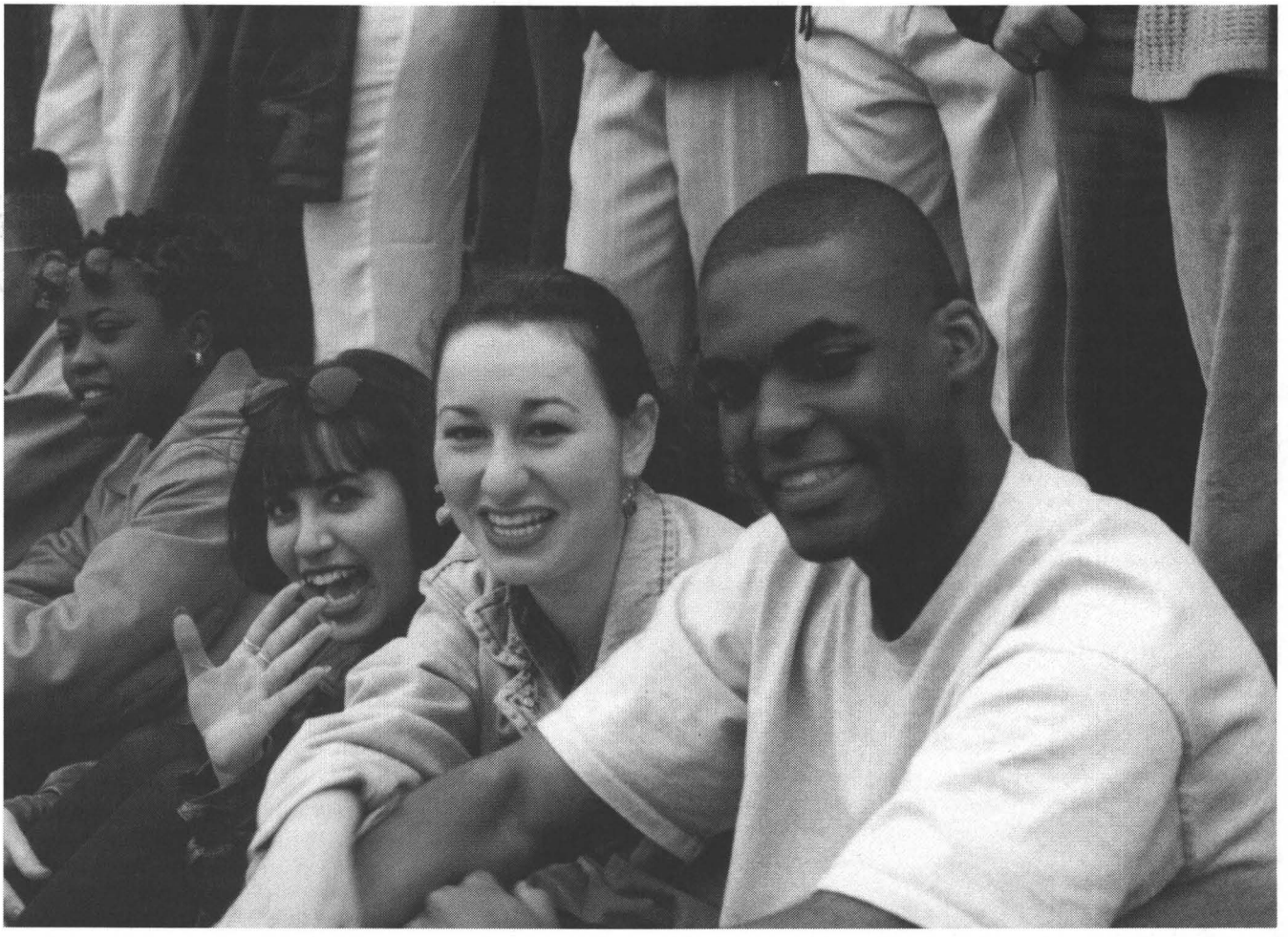
Roth Food Court (631) 632-9377

Kelly Dining Center (631) 632-6519

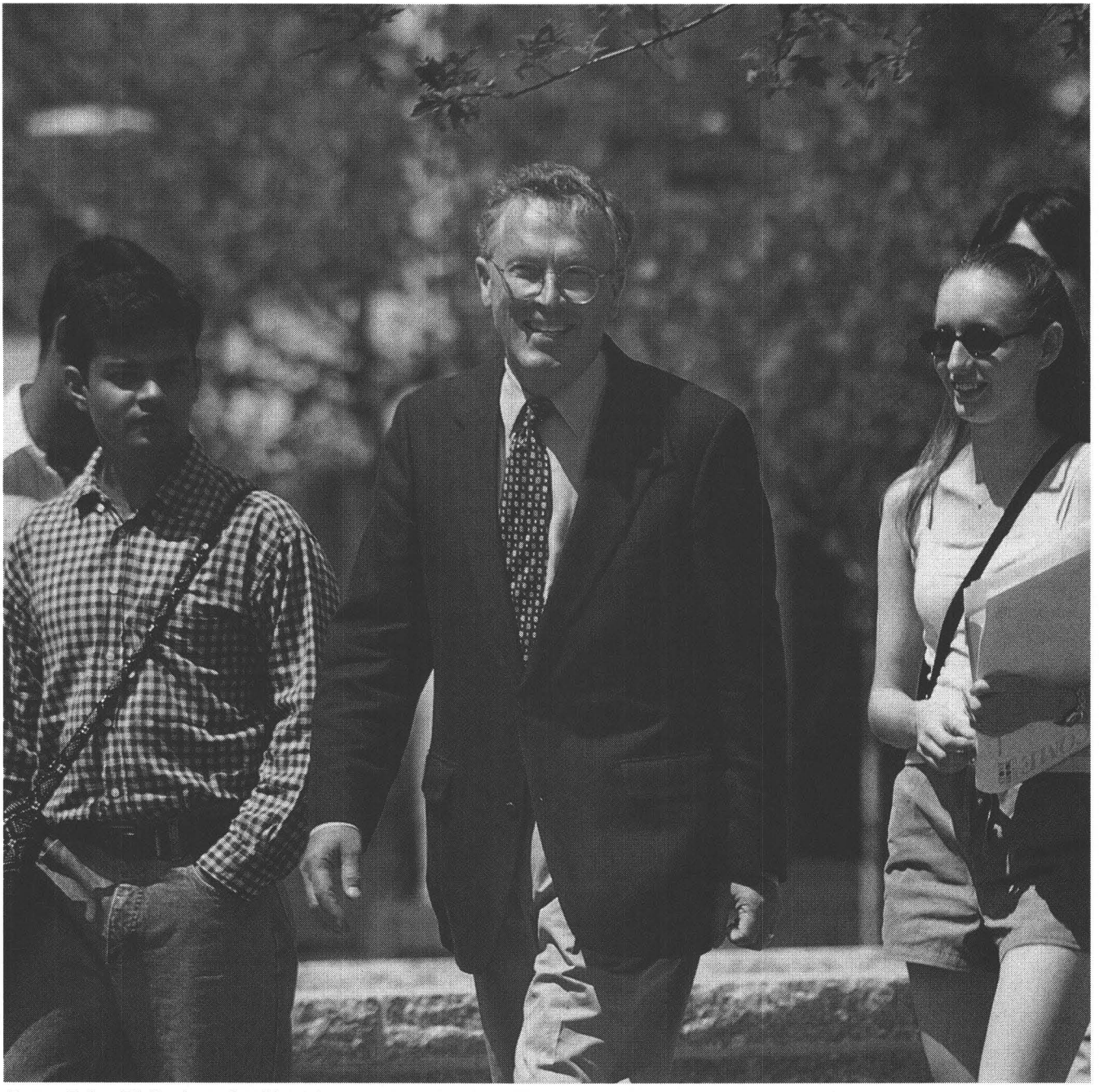
Campus Connection at H-Quad (631) 632-1515

Soda and Snack Vending

In addition to the online meal plan stripe, ID cards have a chip on the front that stores declining balance information. After adding money to the card through one of the conveniently located Cash-to-Chip machines, it can be used at resident and apartment laundry facilities and with the photocopy machine at Cardozo Computing Center and O'Neil Computing Center. Cash-to-Chip machines are located at all resident area dining halls, East and West Campus ID Offices, East and West Campus Libraries, the Stony Brook Union lobby, the Administration Building, Chapin Apartments, and Schomburg Apartments Commons Building. For questions or to report a malfunctioning vending machine, call the Seawolves MarketPlace at (631) 632-9281. For refunds, go to the Seawolves MarketPlace in the Student Activities Center. If your ID card is malfunctioning, go to the ID Office or call (631) 632-2737.



Admission to Graduate Study



Provost Robert McGrath speaks with students on campus.

Requirements for Admission

Admission to the Graduate School requires that the applicant have the preparation and ability that—in the judgment of the program and the Graduate School—are sufficient to enable satisfactory progress in the degree program. A U.S. bachelor's degree or the equivalent is required (for example, a four-year/120 credit hour) with a minimum overall grade point average of 3.0 on a 4.0 scale; the student must present evidence that such a degree will be awarded by the time graduate work is to begin.

Application for admission to the Graduate School is made to a specific program for a designated degree. Additional admission requirements are listed in each program's section of this publication. To be considered for admission, all students must submit a completed application as well as the following documentation to the graduate program:

- Two official copies of all previous transcripts for all colleges and universities attended, including junior and senior college and graduate transcripts (if transcripts are in a foreign language, certified English translations are required in addition to the original documents);
- Three letters of recommendation;
- Scores for the Graduate Record Examination (GRE) General Test (photocopies are not acceptable);
- A nonrefundable application fee of $60 made payable to Stony Brook University;
- Documented proficiency in English for international students (See the English Proficiency Requirements for Non-Native Speakers of English below for details).

Early application is suggested for students seeking financial support. To receive full consideration for admission with financial support, complete admission and financial aid applications should be filed by *January 15* for the fall semester and *October 1* for the spring semester. Admission decisions are made by programs. Late applications will be accepted, but will be considered only by the programs where openings still exist.

Applications may be obtained by contacting the appropriate program or printing the forms and instructions from the Graduate School Web site at *www.grad.sunysb.edu*. Students may also apply online at the same address.

An offer of admission to graduate study at Stony Brook is for a specific semester. An applicant who is unable to enroll for the semester specified should request a deferment of admission from the primary department or program. If the request is granted, the student will be sent a new offer of admission for the subsequent semester and the Graduate School will be notified accordingly. Students who do not enroll within 12 months of the original offer of admission must submit a new application and fee. International students must submit a new "Request for Certificate of Eligibility and Declaration and Certification of Finances" form to request an updated Form I-20 or IAP-66 valid for the updated semester of admission. Unused Forms I-20 or IAP-66 must first be returned.

Graduate Record Examination

The GRE General Test is required of all prospective graduate students. Several programs also require an Advanced Area Test. Please refer to the admission requirements of the specific program of interest. Applicants who have taken the GRE should request that Educational Testing Service forward scores directly to the Graduate School (the Stony Brook code is 2548). Failure to submit GRE scores with the completed application will prevent the review of student applications by the program. Photocopies are not acceptable.

Applications for the GRE are available in the Career Development Office, W-0550 Melville Library, or at *www.ets.org*. For additional information, call 1-800-GRE-CALL.

English Proficiency Requirements for Non-Native Speakers of English

Students are expected to read, write, and speak English. They are also expected to comprehend the spoken language. Applicants whose first or native language is not English must demonstrate proficiency prior to matriculation. To be considered for admission, an applicant must present a passing score for either the TOEFL or IELTS tests. Students who fail to meet this requirement cannot be admitted and must enroll in a course at the Intensive English Center (IEC) and achieve satisfactory grades before admission to graduate study. Students who have taken either of these tests more than two years ago must retake the test. A minimum score of 550 (paper)/213 (computer) is considered passing for the Test of English as a Foreign Language (TOEFL). All doctoral students and master's students who wish to be considered for a teaching assistantship must have a Test for Spoken English (TSE) or Speaking Proficiency English Assessment Kit (SPEAK) score of 55 or better. These tests are given at centers throughout the world several times each year; applicants should forward their scores directly to the Graduate School (the Stony Brook code is 2548). Further information is available by contacting the Education Testing Service, Princeton, New Jersey 08540, USA, or at *www.toefl.org*. Students who take the International English Language Testing System (IELTS) tests instead of the TOEFL are not required to take the TSE. A score of 7 will be considered passing. Further information is available by contacting the IELTS Web site at *www.ielts.org*.

Admission to the Graduate School is contingent upon satisfactory fulfillment of the English proficiency requirement. Performance in the IEC and on the SPEAK test will determine whether a student will be cleared or assigned to an ESL (English as a Second Language) course. All non-native English speakers will be required to pass a test of spoken English before being allowed to teach as a Teacher's Assistant.

Health Records

All accepted students are required by New York State law to file a completed health history and physical examination with the Student Health Service. Transfer students may submit copies of their health forms from their former schools provided they contain the information required by the Student Health Service and are less than two years old.

International Students

Financial Verification

Applicants who are not citizens or permanent residents of the United States must provide the University with verification that the necessary funds are available to finance their education at Stony Brook and for living expenses. The University form SUSB103R2 must be submitted for this purpose before immigration documents will be sent to the admitted students. (The form SUSB103R2 may also be downloaded at *www.grad.sunysb.edu* under the heading "Applying.")

I-20 Documentation

Government regulations require that every international student attend the institution that issued the I-20 used for entry into the United States. Transfers between institutions may be possible if a student can show that he or she reported to the original institution with the appropriate clearance.

Non-Matriculated Status (GSP)

Any person holding a bachelor's degree, its equivalent, or an advanced degree from an accredited institution of higher learning is eligible to be considered for admission to the University as a non-matriculated graduate student. Such students may enroll in graduate courses through the School for Professional Development (SPD) as non-degree students after submitting a completed application form to SPD. Contact SPD for additional information at (631) 632-7050 or at *http://ws.cc.sunysb.edu/spd/*. Non-degree students who later wish to pursue a graduate degree will need to make a formal application for admission to the Graduate School and a degree program and may transfer a maximum of 12 credits taken in non-matriculated status to the graduate degree program.

Transfer of Credit

A maximum of 12 credits may be transferred to a master's program at Stony Brook with the approval of the program and the Graduate School provided that they have not been used toward the satisfaction of any degree requirements here or at another institution. A candidate for the doctoral degree may transfer those graduate credits that are allowed by the appropriate departmental or program committee.

Transfer from Non-Matriculated Status (SPD)

Students transferring from non-matriculated status are limited to a maximum of 12 graduate credits for master's degrees. Students must be formally matriculated into a degree program before the petition to transfer is submitted. All graduate courses completed in non-matriculated status will be counted as part of the total graduate grade point average (GPA).

Transfer from Other Institutions

A candidate for the master's degree may petition to transfer a maximum of 12 graduate credits from another institution toward their master's degree requirements. These credits must be from an institution authorized to grant graduate degrees by recognized accredited commissions and meet the following guidelines:

- Credits must not have been used to fulfill the requirements for either a baccalaureate or another advanced degree or certificate.
- Credits must not be more than five years old at the time the student is admitted to graduate study at Stony Brook. Courses older than five years will be accepted only in rare circumstances.
- A course listed as both graduate and/or undergraduate level will not be considered for transfer.
- Credits must carry the grades of A or B. "Pass" or "Satisfactory" grades are not transferable unless these grades can be substantiated by the former institution as B (3.0) or better.
- Grades earned in transferred courses are not counted as part of the overall GPA at Stony Brook.
- Work from one master's degree is not transferable to a second one.

Transfer Between Primary and Secondary Programs

A maximum of 12 graduate credits from Stony Brook, which were earned in a primary program prior to a student being accepted into a secondary program, can be applied to the secondary program. Credits applied to the degree requirements of a primary program cannot be applied toward the degree requirements of a secondary program.

Special Circumstances

Waiver of Application Fee

All applicants are required to pay the application fee. Exceptions include:

- Students who reapply for admission within one academic year;
- Students who are U.S. citizens and have current documentation from a financial aid administrator of an appropriate college or university official substantiating that they are currently enrolled and that the payment of the application would create a financial hardship (*complete financial information for the current academic year must be provided, including total cost of education and amount and types of financial aid received*);
- Currently enrolled undergraduate students in a U.S. institution who hold a cumulative GPA of 3.75 or better.

To qualify, the waiver request must be submitted with the application for admission, including official copies of all transcripts.

Readmission

Graduate students who have interrupted their attendance at Stony Brook by withdrawing from the University or by taking a leave of absence must be readmitted to graduate study. The student initiates the process by submitting a completed "Readmission" form to their program. The form is available at the Graduate School or may be downloaded at *www.gradsunysb.edu*.

- Students not on an official leave of absence must submit a $500 readmission fee, as well as the first two pages of the admission application.
- International students must also submit a new financial affidavit and be cleared by an international student advisor before the readmission process can be concluded.

If the program approves the request, the readmission form is submitted to the Graduate School for final approval. The program or the Graduate School may set specific requirements to be fulfilled by the readmitted student during the first year of admission.

Conditional Admission

In exceptional cases where certain admission requirements are not met or the undergraduate preparation is inadequate, an applicant may be admitted conditionally. Such applicants will be considered on probation during the first semester. Program recommendation and Graduate School approval are required for conditional admission.

- Students admitted conditionally for a low cumulative GPA must earn an overall graduate average of at least a B (3.0) during the first semester of enrollment to be permitted to continue. In this case, the student is considered to have achieved regular status.
- A student admitted conditionally because of a low cumulative GPA who fails to earn a B (3.0) average in the first semester will not be permitted to reenroll. Both the student's program and the Graduate School may set conditions that the student must satisfy during the early period of graduate work.

Change of Major

Should a student wish to change programs following admission, a "Change of Major" form must be submitted to the Graduate School with original signatures by both prior and new department or program chairs and advisors. The form is available at the Graduate School or can be downloaded at *www.grad.sunysb.edu*. In addition, international students who seek to change their program must obtain approval of an international student advisor.

Secondary Program

Should a student wish to add a secondary program to his or her primary program of study, a Permission to Enroll in a Secondary Degree or Certificate Program form must be submitted to the Graduate School with original signatures by both prior and new department or program chairs. Final approval rests with the Graduate School. International students are required to obtain approval of an international student advisor.

Academic Level

Full-Time Students

Students admitted for full-time study to the Graduate School will usually register for either 12 or nine credit hours per semester based on their academic level. Responsibility for certifying the full-time status of graduate students rests with the Office of the Registrar.

Incoming full-time graduate students are classified as G1, G2, G3, or G4 depending on the program to which they have been admitted and their previous graduate training.

- Students without prior graduate work will be classified as G1 in a master's program or G3 in a doctoral program. Students classified as G1 or G3 need to register for 12 credits to maintain full-time status.
- A student who has earned more than 24 graduate credits at another institution before being admitted will be classified as G2 in a master's program or G4 in a doctoral program. Students classified as G2 or G4 need only register for nine credits to maintain full-time status.
- The academic level of a G1 or G3 student who has successfully completed 24 credits of coursework at Stony Brook is changed to G2 or G4, respectively.
- A student who has completed the necessary requirements for the doctoral degree except for the writing of the dissertation is classified as G5 upon advancement to candidacy and should register full time for dissertation research. As of fall 2002, G5 students will need to be registered for nine credits of dissertation research to be considered full time.

Part-Time Students

Incoming part-time students admitted to the Graduate School will register for no more than 11 credit hours per semester. Programs may, in consultation with the dean of the Graduate School, regulate the proportion of part-time students in their graduate program.

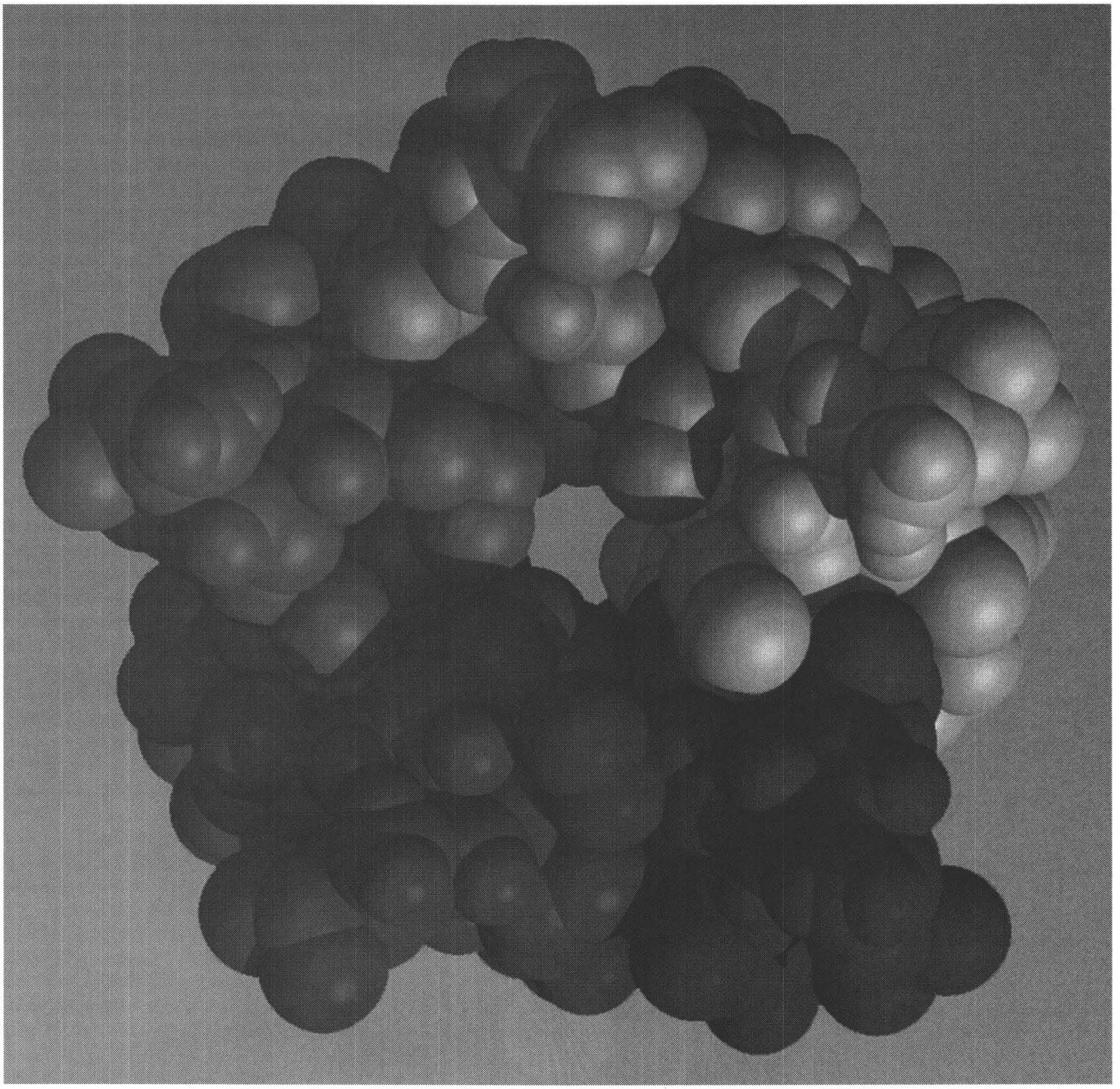
Part-time students are classified as G1, G2, G3, or G4 depending on the program to which they have been admitted and their previous graduate training.

- The academic level of a G1 or G3 student who has completed 24 credits of coursework at Stony Brook is changed to G2 or G4, respectively.

Combined Bachelor's/Master's Programs

Five-year bachelor's/master's programs are available in several academic departments. Some are joint programs between two departments or colleges. By providing articulation between the degree programs, these five-year programs reduce the total time for completion of the master's degree. For more information, please contact the specific department or program of interest.

Academic Regulations and Procedures



Pentameric structure of phospholamban, an integral membrane protein in cardiac muscle cells. A cross section through the transmembrane region of the protein is shown.

All programs, regulations, and schedules of dates are subject to change or withdrawal depending on the availability of funds and the approval of programs by appropriate state authorities.

It is the student's responsibility to be aware of University regulations and procedures as set forth in this Bulletin and in official campus publications and notices.

Organization of Graduate Education at Stony Brook

Under the direction of the provost, Graduate School administration rests with the dean and the administrative staff of the Graduate School in conjunction with the Graduate Council.

The Graduate Council

The membership of the council includes one representative from the library, one professional employee and two representatives each from the faculty of the Health Sciences Center, the College of Engineering and Applied Sciences, the Division of Humanities and Fine Arts, the Division of Social and Behavioral Sciences, and the Division of Natural Sciences. One of the two Health Sciences Center representatives must be from Basic Health Sciences. Additional members include two graduate students chosen by the Graduate Student Organization. Elected faculty members serve for three years with staggered terms. The chairperson and the secretary of the Graduate Council are elected by the council. Among other duties detailed in the "Faculty By-Laws," the council must approve all graduate programs before their submission to the SUNY System Administration Office and the State Department of Education.

The Department/Program

Each department exercises a large measure of responsibility for its graduate programs. Under the general responsibility of the departmental chairperson, each department has a graduate program director who administers graduate activities. Each program also has an appeals and grievances committee comprised of equal numbers of faculty and graduate student members. Individual programs select graduate applicants and recommend them for admission to the dean of the Graduate School. The programs are responsible for the nomination of students and applicants for fellowships, traineeships, assistantships, and tuition scholarships, as well as for the administration of graduate programs, including coursework, supervised research, teaching assistantships, and graduate examinations. It is the program that certifies to the Graduate School that the student has completed all degree requirements.

Graduate programs not housed in specific departments are governed by interdepartmental faculty committees chaired by a graduate program director. For purposes of graduate education, they function as do departments in other disciplines.

Registration

All students enrolled in the Graduate School in any program, whether in residence or absentia, must register each fall and spring for at least one graduate credit until all degree requirements have been met. A student is not considered to have registered until the appropriate forms have been filed with the Office of Records/Registrar and arrangements regarding tuition and fees have been made with the Bursar's Office.

- Students who hold a TA, GA, RA, fellowship, or tuition scholarship must be registered as full-time students by day 15 of classes each semester.
- Students failing to register during the advance or final registration period may still register during the first 15 days of the semester, but will be charged a late fee of $40.
- Students who have not been granted an official leave of absence by the dean of the Graduate School and have not yet registered will be considered to have withdrawn from the University.
- Students are responsible for making sure they are registered on time.

Programs or individual faculty members do not have authority to waive these rules.

Course and Credit Enrollment

The majority of credits taken during any semester must apply toward a student's primary degree program. Failure to comply with the guidelines below will result in the tuition scholarship being rescinded for the semester.

- All students must have prior permission from their department/program to take any courses outside of their primary degree plan.
- Tuition scholarships only apply to courses that fulfill degree requirements in the program providing the scholarship. A student with a full-time nine-credit tuition scholarship from a primary program may take a course in a secondary program. However, if a student with a nine-credit tuition scholarship from their primary program wishes to take a course in a secondary program, it must be in addition to the nine credits applying toward the primary program during the same semester.

Course Changes

- Graduate students may add or register for classes through day 15 of classes.
- Graduate students may drop classes through day ten of classes without incurring a tuition liability and without a W (withdrawal) being recorded.
- From days 11 to 15, graduate students may only drop from courses if an even number of credits are added in a single transaction (i.e., 12 credits for 12 credits), or they may withdraw from a class. When a student withdraws from a class, a W is posted and tuition is charged based on the Tuition Liability schedule. This information is available at the at *http://ws.cc.sunysb.edu/registrar*.
- Retroactive add/drop petitions must have the approval of the graduate program director and the Graduate School and will not be processed by the Registrar's Office until a $20 fee is paid.

Advancement to Candidacy

A student may be advanced to candidacy after completing Graduate School and program requirements other than the dissertation or its equivalent.

- Students on academic probation cannot be advanced to candidacy.
- Advancement to candidacy is granted by the dean of the Graduate School upon recommendation of the graduate program director.
- Students must advance to candidacy at least one year before the beginning of the semester in which they plan to defend their dissertation.

Degree Candidacy

All degree candidates must register for one credit during thesis or dissertation research for the semester in which the degree is awarded. Students on approved leaves of absence do not register for those semesters for which a

leave has been granted; however, they must register for the semester in which the degree is awarded.

Leave of Absence

Leaves are generally granted for one semester or year at a time, renewable upon request for a maximum of two years, and should be requested prior to the beginning of the semester. In order to request a leave, the student must have been registered for the previous semester. "Leave of Absence" forms are available at the Graduate School or may be downloaded at *www.grad.sunysb.edu* and should be submitted to the graduate program director for approval. If the graduate program director approves the request, approval is then recommended to the dean of the Graduate School. In addition, international students who seek a leave of absence must obtain approval of an international student advisor. Military leave of absence will be granted for the duration of obligated service to students in good standing.

- A student on academic probation may be granted a leave of absence with the understanding that re-enrollment is subject to conditions imposed by the Graduate School and the program. These conditions will be specified in writing at the time the leave is approved.
- Any semester in which a student is on an approved leave of absence does not count in the calculation of the student's time limit for degree completion.

Students planning to return from leaves should inform their program of their intention, preferably three months in advance of the term for which they wish to register. A current address should be given to the program. The academic program will then complete a Readmission Form and submit it to the Graduate School.

Withdrawal from the University

The process of withdrawing from the University is a formal procedure, which the student must initiate. A student finding it necessary to withdraw from the University must submit a letter of intention to the graduate program director and the Graduate School.

- Students may withdraw from the University up to the last day of classes; however, financial liability to the University still remains. Permission may be granted by the Graduate School by submitting a completed "Retroactive Withdrawal" form available at the Graduate School or may be downloaded at *www.gradsunysb.edu.*
- Students are urged to discuss all withdrawals with their graduate program director and academic advisor before such an action is taken.

International students must discuss withdrawals with an international student advisor before initiating the process as a withdrawal may jeopardize their immigration status.

Unauthorized Withdrawal

A student who leaves the University without obtaining an official withdrawal may forfeit the privilege of honorable withdrawal and endanger prospects of readmission to the Graduate School. Such students will be reported as having failed all courses for which they were registered the semester they left the University.

SUNY Exchange Program

When the special educational needs of a doctoral student at one SUNY institution or the graduate center of CUNY can be served best by taking courses at another unit of the SUNY system or at the graduate center of CUNY, the student should obtain an application from the program director to apply for admission to take the desired courses at the host institution.

- The recommendation from the program should state that the student has the proper prerequisites and that, if the courses are successfully completed, credit for them will be accepted toward the degree.
- The statement from the program director requires approval from the dean of the Graduate School. The approval will then be sent to the dean of the Graduate School of the host institution, who will clear it with the department concerned. When approval is obtained, the student will be admitted to take the courses requested.
- The student will pay appropriate tuition and fees at the host institution. If the student has a tuition scholarship at Stony Brook, that scholarship will be recognized by the host institution.

At the completion of courses, the host institution will, on request, send a transcript to Stony Brook.

Inter-University Doctoral Consortium

The Inter-University Doctoral Consortium (IUDC) is comprised of several universities in and around New York City, including Columbia, CUNY, Fordham, New School University, Princeton, and Rutgers. Eligible graduate students in the arts and sciences will be able to register for some courses at these institutions for Stony Brook credit, and library privileges will also be extended to participants while registered. Interested students should contact their graduate program director.

- Students may only register for courses not available at their home institution.
- Students will pay appropriate tuition and fees at their home institution.
- Consortium registration is intended for doctoral candidates and is restricted to graduate courses.

Grading System

The following grading system will be used for graduate students in graduate courses: A (4.0), A- (3.67), B+ (3.33), B (3.00), B- (2.67), C+ (2.33), C (2.00), C- (1.67), F (0.00). Pass/No Credit (P/NC) and grades of D are not approved grades for graduate students.

- A student's permanent academic record must reflect a final grade or a withdrawal grade for each course in which he or she is enrolled.
- If a final grade has not been reported by the scheduled deadline, or if the deadline has not been appropriately extended, an F will be recorded.
- Graduate students may repeat courses without limit. Credits will be counted toward the degree only once, and only the most recent grade will be used to calculate the cumulative GPA. This option does not apply to variable or repetitive courses.
- A student's official transcript will show all grades received and the cumulative GPA will reflect all grades.

I (Incomplete)

An I is an interim grade given at the discretion of the instructor at the student's request and upon evidence that good cause, such as serious illness, prevented the student's completion of course requirements. In granting a grade of I, the instructor signifies a willingness to receive student work and submit grades in accordance with these deadlines.

- Auditing a subsequent offering of the course may not make up an Incomplete.

- Final grades for students granted temporary reports of an Incomplete must be submitted by the first day of classes of the semester following the Incomplete. However, the instructor may require that the work be completed at any time prior to the end of the Incomplete extension period. Students should confer with their instructors to establish how far in advance of the deadline work must be completed.
- An instructor may request an extension of the original Incomplete by sending written notification to the Office of Records/Registrar before the first day of classes. Any extension will usually be limited to the last day of classes of the semester following that in which the course was taken. Any subsequent exception must be appealed by the student with a written letter of support or denial by the faculty member addressed to the Graduate School.

If final grades are not reported to the Office of Records/Registrar by the specified dates, the grade of I will automatically change to I/F.

S/U (Satisfactory/Unsatisfactory)

A grade of S indicates passing work (equivalent to the grade of B or higher) in those courses so designated by the program and approved by the Graduate Council where the usual mode of evaluation is impractical. A grade of U indicates unsatisfactory work. S/U grades are not calculated as part of a student's cumulative or semester GPA.

Courses that are usually offered on a S/U basis are so indicated in the graduate class schedule published for each term.

R (Registered)

R is assigned to indicate attendance during the first semester in a year-long course. The final grade will be assigned after the completion of two semesters.

NR (No Record)

An instructor may assign a temporary report of NR only for students who have never, to the instructor's knowledge, participated in the course in any way. An NR report is not to be interpreted as a grade but only as an indication of a temporary state of affairs that requires prompt resolution leading either to removal of the course from a student's program or to the assignment of a grade.

Change of Grade

Grades appearing on a student's academic record may not be changed after one calendar year from the start of term in which the grade was incurred.

- A final grade may not be changed on the basis of work completed after a term has ended.
- A final grade appearing on a student's academic record at the time of graduation cannot be changed to any other grade subsequent to the graduation date.

Grade changes that involve changing one grade to another, changing an incomplete to a letter grade after the first day of classes, or changing an incomplete to a letter grade after an extension has expired, must be approved by the dean of the Graduate School.

Auditing

Auditing is permitted by special arrangement between student and instructor. No record is kept of such courses.

Academic Probation

When a student's cumulative graduate GPA falls below B (3.0) for grades earned in courses numbered 500 and above taken at Stony Brook, the student shall be placed on probation.

- If the student's overall GPA has been raised to B (3.0) by the end of the next semester of enrollment after being first notified of probation, the student will be returned to regular status.
- Students may be on probation for a maximum of two semesters.
- A student on academic probation who fails to achieve a 3.0 cumulative GPA by the end of the second semester on probation will usually not be permitted to re-enroll.
- A student who has changed a registered area of graduate studies may, upon the request of the new program, have their record treated as two separate records. The GPA for the new area of graduate studies may be calculated from the beginning of the semester in which the change became effective.
- A student enrolled part time who has accumulated six semester credits with a cumulative average below 3.0 will have two semesters, or six additional credits (whichever comes first) to bring their cumulative GPA to 3.0.
- A grade of I or blank is not calculated in determining the eligibility for academic probation.

Programs may have additional requirements as specified in program literature. Failure to meet these requirements may result in academic probation.

Standards of Academic Conduct

The University expects all students to cooperate in developing and maintaining high standards of scholarship and conduct. Graduate students come under rules and regulations outlined in the Graduate School Policy Manual under section 4-001, Grievances and Appeals.

Students are expected to meet academic requirements outlined in this Bulletin and financial obligations as specified in "Financial and Residential Information" in order to remain in good standing. Certain non-academic rules and regulations must also be observed.

The University wishes to emphasize the policy that all students are subject to the rules and regulations of the University currently in effect, or which, from time to time, are put into effect by appropriate authorities. Students, in accepting admission, indicate their willingness to subscribe to, and be governed by, these rules and regulations. They also acknowledge the right of the University to take such disciplinary action, including suspension and/or expulsion, as may be deemed appropriate. University authorities will take action in accordance with due process.

Academic Honesty and Scholarly Misconduct

Intellectual honesty is the cornerstone of all academic and scholarly work. Therefore, the University views any form of academic dishonesty as a serious matter. Detailed procedures for hearings and other functions at the judiciary processes are available in the Graduate School or in the Graduate School Policy Manual, which may be found at *www.grad.sunysb.edu.*

Appeals and Grievance Procedures

A variety of appeals and grievance procedures are available. These complement other means to address and resolve concerns of graduate students, such as the Graduate Student Organization, Graduate Student Employees Union, the Graduate Student Advocate, and for graduate research assistants, the Research Foundation. Students encountering difficulties with program or Graduate

School policy or procedure, or with faculty or staff, should discuss the problem with their advisors and their graduate program directors whenever possible.

- The graduate program director or program chair may refer a student's grievance to the Departmental Grievance Committee, which may not include anyone named in an individual grievance case.
- Grievances that either cannot be resolved or should not be reviewed at the department/program level may be brought to the dean of the Graduate School. The dean will consult as needed with the Graduate Council Appeals Committee.
- Grievances that involve allegations of scholarly misconduct must be adjudicated by the Office of the Vice President for Research.

Detailed procedures for the appeals and grievance process are available in the Graduate School or in the Graduate School Policy Manual, which can be found at *www.grad.sunysb.edu.*

Student Educational Records

The Family Educational Rights and Privacy Act permits current or former students to inspect and review their educational records. Students are also accorded the right to a hearing in order to question the contents of their educational records. Written consent of students may be required before personally identifiable information about them will be released from their educational records as provided by law.

Specific guidelines and procedures are contained in the Policy Manual of the University, T-507, "Family Educational Rights and Privacy Act." A copy of this manual is available in the Reference Room of the Melville Library.

After administrative remedies available at the University have been exhausted, inquiries or complaints may be filed with the Family Educational Rights and Privacy Act Office, Department of Health and Human Services, 330 Independence Avenue, S.W., Washington, DC 20201.

Applicants or students may waive their rights to inspect confidential letters or statements of recommendation.

Transcripts

Students who wish to have Stony Brook transcripts forwarded to another institution or agency, or to themselves for their own use, must submit their requests at least two weeks before the transcripts are needed. Requests can be made in person at the cashier window of the Bursar's Office or via mail or facsimile. The fee for each transcript is $5. Each request must include:

- Your name;
- Your social security number or student ID;
- Your current address and telephone numbers (both day and evening);
- Your degree date or term of last attendance;
- The exact address to which you want your transcript sent.

If making requests by mail, address a letter and mail payment to Transcripts, P.O. Box 619, Stony Brook, NY 11790-0619. Fax requests require a VISA, MC, or Discover card number and expiration, and your signature as approval to charge your credit card; send information to (631) 632-9318. For additional information, visit *http://cc.sunysb.edu/registrar.*

All financial obligations to the University must be satisfied before a transcript can be released. A request for a transcript must be made by the student. Students who have both an undergraduate and a graduate transcript and want only one of them sent should specify it in their request. Partial transcripts of either the undergraduate or graduate academic records are not issued.

Equivalent Opportunity/ Religious Absences

As students may be unable to attend classes on certain days because of religious beliefs, section 224-a of the Educational Law provides that:

- No person shall be expelled from or be refused admission as a student to an institution of higher education for the reason that he or she is unable, because of religious beliefs, to attend classes or to participate in any examination, study, or work requirements on a particular day or days.
- Any student in an institution of higher education who is unable, because of religious beliefs, to attend classes on a particular day or days, be excused from any examination or any study or work requirements.
- It shall be the responsibility of the faculty and of the administrative officials of each institution of higher education to make available to each student who is absent from school, because of religious beliefs, an equivalent opportunity to make up any examination, study, or work requirements that he or she may have missed because of such absence on any particular day or days. No fees shall be charged by the institution for making available to the said student such equivalent opportunity.
- If classes, examinations, study, or work requirements are held on Friday after 4:00 p.m. or Saturday, similar or makeup classes, examinations, study or work requirements shall be made available on other days, where it is possible and practicable to do so. No special fees shall be charged to the student for these classes, examinations, study, or work requirements held on other days.
- It shall be the duty of the faculty and of the administrative officials of each institution of higher education to exercise the fullest measure of good faith. No adverse or prejudicial effects shall result to any students because of their availing themselves of the provisions of this section.
- Any student who is aggrieved by the alleged failure of any faculty or administrative official to comply in good faith with the provisions of this section shall be entitled to maintain an action or proceeding in the supreme court of the county in which such institution of higher education is located for the enforcement of his or her rights under this section.
- As used in this section, the term "institution of higher education" shall mean schools under the control of the Board of Trustees of the State University of New York, the Board of Higher Education of the City of New York, or any community college.

Academic Calendar

Stony Brook University operates on a semester system, with fall registration occurring during the last week of August. The fall semester usually starts the first week of September and finishes before December 25. The spring semester usually begins the last week of January and finishes the last week of May. The last week of each semester is devoted to final examinations. In addition to these two semesters, classes are offered during two summer session terms.

A detailed academic calendar is prepared each year and is available at *http://ws.cc.sunysb.edu/registrar.*

Degree Requirements

It is possible to learn without being educated. Learning merely implies the amassing of knowledge. An educated person is much more than a receptacle for facts. He or she is able to present those facts to others with grace and clarity, and to manipulate and juxtapose them with a broader base of knowledge in order to gain new insights. Finally, an educated person never ceases to test his or her knowledge against the highest standards of scholarship and to develop new ways of thinking about the facts that he or she encounters or uncovers in the course of a lifetime.

Education at the graduate level clearly implies the amassing of knowledge beyond that gained in an undergraduate degree, but the nature of the knowledge and the ways in which it is gained and used are also significantly different. It is expected that graduate students will gain detailed knowledge about a more specialized field than at the undergraduate level. The process of acquiring that knowledge is also much more independent and more reliant upon the initiative of the student. In spite of the necessarily specialized nature of the new knowledge, at Stony Brook graduate students are expected to maintain a broad perspective on their studies, such that they are able to take part in scholarly discourses in the broadest possible range of disciplines. Graduate students are, therefore, responsible for extracurricular self-education within and beyond their own fields of study; the mere satisfaction of the technical requirements for a degree is not sufficient to make one an educated person.

With education comes responsibility. Stony Brook demands the highest level of scholarly ethics from all members of the academic community. Graduate students must make themselves aware of the ethical issues of academia in general, and of their own fields in particular. No degree candidate can be considered fully educated who lacks an appreciation of these values and a dedication to upholding them.

The degree requirements listed in the Bulletin are correct as of the press date and apply to graduate students first matriculated in the academic years 2003-2004. The requirements in this section are the minimal ones mandated by the Graduate School; the individual graduate programs may set additional requirements. Any changes in requirements will apply only to students who first matriculate in their particular program after the change is approved and communicated to students at the time of admission. The University reserves the right to alter these regulations without notice.

The Degrees of Master of Arts, Master of Business Administration, Master of Fine Arts, Master of Music, and Master of Science

Master of Arts, Master of Business Administration, Master of Fine Arts, Master of Music, and Master of Science are advanced degrees implying the acquisition of knowledge and skills beyond those required for a baccalaureate.

- Some of these degrees may be taken en route to a doctoral degree, while others are terminal.
- All master's degrees imply the recognition of their holders as skilled practitioners of their disciplines.
- In order to be awarded a master's degree, it is necessary to demonstrate a grasp of advanced knowledge through coursework and the ability to learn independently and to communicate effectively with one's peers.
- The granting of the master's degree is based upon the completion of any special program requirements in addition to the items listed below.

A. Courses and Grade Point Average

A student must achieve a 3.0 overall GPA in all graduate courses taken at Stony Brook to receive a degree. A minimum of 30 to 60 credits of graduate work is required to receive a master's degree.

- At the written request of the new program, the record of a student who has changed his or her registered area of graduate study may be treated as two separate records for the purposes of meeting degree requirements. The GPA for the new area of graduate study may be calculated unofficially from the beginning of the semester in which the change was effective.

B. Language Proficiency

Although the Graduate School does not require proficiency in a foreign language for the master's degree, programs have the responsibility for their own foreign language requirements and the evaluation of proficiency. Students must comply with program requirements.

C. Teaching

Some departments require at least one semester of practicum in teaching under supervision. The form this practicum takes may differ by discipline. It might include seminar or class presentations, assisting in laboratories, leading discussion sections, or grading. Grading experience by itself will not be considered sufficient for satisfaction of this requirement. Faculty are responsible for providing informal feedback and formal evaluation.

D. Thesis and Comprehensive Examination

The requirement for the thesis and comprehensive examination varies from program to program. Some programs require a thesis and others require a comprehensive examination, while some require only a master's paper.

- For specific requirements, refer to each program's section of this Bulletin.
- If a thesis is to be filed with the Graduate School, it must be prepared in accordance with the guidelines presented in the Guide to the Preparation of Theses and Dissertations available on the Graduate School Web page.
- Multiple authorship of a thesis or dissertation is not permissible.

E. Degree Application

Students must apply for graduation online at the Graduate School Web page in accordance with published deadlines. If degree requirements are not met, students must reapply for any subsequent awarding periods.

F. Registration

Degree candidates must be registered in the semester they intend to graduate. Students who intend to graduate in the spring or fall must register for at least one graduate credit. Students who intend to graduate in the summer can register for zero credits, but it still must be a graduate level course.

G. Program Recommendation

When all program requirements are completed, the Graduate Program Director may recommend to the Dean of the Graduate School that the master's degree be granted.

H. Time Limit

The following guidelines apply to all first-time matriculated students

enrolled in the Graduate School.

- Full-time students must complete all degree requirements within three years.
- Part-time students must complete all degree requirements within five years.
- In exceptional cases where the program cannot be completed within these periods, students may petition for an extension of the time limit. Petitions may be in letter form and require the approval of the student's advisor and Graduate Program Director. Requests for a time-limit extension must be filed before the limit is exceeded and must contain a significant justification. The final decision rests with the Dean of the Graduate School, who may impose additional requirements.

I. Standards

Appreciation of the ethical questions and adherence to the highest ethical standards of the discipline are required.

Master of Arts in Liberal Studies Degree

This is a terminal, non-research degree offered by the School of Professional Development (SPD). See the SPD section of this Bulletin for more information.

The Ph.D. Degree

The degree of Doctor of Philosophy was historically the first degree to be conferred by universities. It is granted in recognition of a candidate's high level of scholarly competence and demonstrated ability to conduct and report significant research independently and effectively.

"Doctor" is the Latin Word for "teacher." "Philosophy" in its broadest definition means "all knowledge." The modern sense of the title "Doctor of Philosophy" refers to one who comprehends all knowledge in his or her chosen field and has mastered an area of specialization. He or she has added in a significant way to that body of knowledge and has transmitted the new knowledge, thus teaching the world something new. A person who has received the doctorate has mastered appreciation of the ethical questions and has adhered to the highest ethical standards of the discipline. It is further expected that the future work of the candidate for the Ph.D. will maintain and uphold the same standards of scholarship demanded for the degree, so the title and its meaning continue to apply.

The three requirements for the Ph.D. are assessed in the final defense of a dissertation.

- The dissertation should demonstrate significant original work.
- The final dissertation should be presented with clarity of thought and excellence of exposition that make it suitable for publication as a book or a series of papers in learned journals.
- The dissertation should demonstrate a breadth and depth of the candidate's knowledge beyond the confines of his or her own research and is also critically assessed in the defense and at various examinations during the student's studies.

Admission to the Graduate School does not automatically qualify a student as a candidate for the Ph.D. degree. Formal recommendation of advancement to candidacy for the Ph.D. degree must be made to the Graduate School by the program after a review of the student's performance in courses, independent study, and program examinations. A candidate for the Ph.D. degree engages in research leading to a dissertation. Listed below are the minimal requirements mandated by the Graduate School. The individual programs may set other requirements.

A. Courses and Grade Point Average

The student will follow an approved program of courses determined to meet his or her needs and to satisfy program requirements.

- A student must achieve a minimum 3.0 overall GPA in graduate courses taken at Stony Brook in order to receive a doctoral degree.
- At the written request of the new program, the record of a student who has changed his or her registered area of graduate study may be treated as two separate records for the purposes of meeting degree requirements. The GPA for the new area of graduate study may be calculated unofficially from beginning of the semester in which the change was effective.

B. Language Proficiency

Although the Graduate School itself does not require proficiency in a foreign language for the Ph.D. degree, programs have responsibility for their own foreign language requirement and evaluation of proficiency. Students must comply with program requirements. The proficiency examination must usually be passed before permission is given to take the preliminary examination.

C. Preliminary Examination

The purpose of the preliminary examination is to ascertain the breadth and depth of the student's preparation and to appraise readiness to undertake significant original investigation.

- At the discretion of the program, the preliminary examination may be oral, written, or both, and may consist of a series of examinations.
- The examining committee is appointed by the Dean of the Graduate School on recommendation of the Graduate Program Director.
- It must include at least two faculty members from the program and may include one or more members from outside the University or program.
- Results of the preliminary examination will be communicated to the student as soon as possible and to the Graduate School within one week of the completion of the examination.
- A repetition of the preliminary examination, upon failure, may be scheduled at the discretion of the program. The Dean of the Graduate School must approve a second repeat.

D. Advancement to Candidacy

A student may be advanced to candidacy when all Graduate School and program requirements for the degree other than the dissertation have been completed.

- Students on academic probation cannot be advanced to candidacy.
- Advancement to candidacy is granted by the Dean of the Graduate School upon recommendation of the Graduate Program Director.
- Students must be classified as a G4 at the time of request.
- Students must advance to candidacy one year (minimum two semesters) before the beginning of the semester in which they plan to defend their dissertation.

E. Dissertation

A dissertation is required for the Ph.D. degree. It must convey in a clear and convincing manner the results of an original and significant scholarly investigation.

- Depending on the character of the student's research, the Graduate Program Director will appoint an appropriate supervisor or supervisory

committee in consultation with whom the student will conduct an investigation and write a dissertation.

- The dissertation must be prepared in accordance with the guidelines presented in the Guide to the Preparation of Theses and Dissertations available on the Graduate School Web page.
- Multiple authorship of a dissertation is not permissible.

F. Dissertation Examining Committee

The dissertation must be approved by a dissertation examining committee including at least three faculty members of the program and one outside member, appointed by the Dean of the Graduate School.

- Included in the makeup of the committee is a dissertation supervisor, defense chairperson, a third member from the program, and at least one person outside the program or University.
- The outside member should have expertise in the student's research field so as to be able to understand, criticize, and contribute to the dissertation, as well as to judge the quality and significance of the research.
- The dissertation supervisor cannot serve as chairperson of the examining committee.

G. Dissertation Defense

Examination of the dissertation involves a formal oral defense. This event will be conducted by the dissertation committee and will not be chaired by the supervisor of the dissertation.

- The formal defense must be announced at least three weeks in advance and is open to all interested members of the University community.
- All candidates must provide the Graduate School with a dissertation abstract or recital program, as well as other relevant details, at least three weeks in advance of the proposed event. The Doctoral Defense Announcement form is available on the Graduate School Web page.
- All dissertation defenses shall take place on campus and require the full attendance of the dissertation examining committee. Any exceptions from this practice will require approval from the Dean of the Graduate School.
- The examination that follows the public defense may be either open to the public or closed, at the discretion of the dissertation examining committee.
- The Graduate School will be responsible for advertising the defense to the University community.
- A student may register for no more than one additional semester following the successful defense of the dissertation.
- The signatures on a committee approval form, which appear on page ii of the student's dissertation, will indicate approval of the defense of the dissertation itself.

H. Teaching

At least one semester of practicum in teaching under supervision is required. The form this practicum takes may differ by discipline. The experience might include making seminar or class presentation, assisting in laboratories, or leading discussion sessions. Grading experience by itself will not be considered sufficient for satisfaction of this requirement. Faculty are responsible for providing informal feedback and formal evaluation.

I. Residence Requirements

At least two consecutive semesters of full-time graduate study in the program granting the degree are required. The purpose of the residence requirement is to ensure that the graduate student participates in the professional life of the program beyond class attendance. Some program residence requirements may vary from the Graduate School norm and are described in the individual program requirements for the degree. Unless specified, however, the Graduate School regulation takes precedence.

J. Degree Application

The student must apply for graduation online at the Graduate School Web page in accordance with published deadlines. If degree requirements are not met, students must reapply for any subsequent awarding periods.

K. Registration

Students who intend to graduate in the spring or fall must register for at least one graduate credit. Students who intend to graduate in the summer can register for zero credits, but it still must be a graduate level course.

L. Program Recommendation

When all program requirements are completed, the Graduate Program Director may recommend to the Dean of the Graduate School that the Ph.D. degree be granted.

M. Time Limit

The time limit for a doctoral degree is seven years for a student who has a closely related previous graduate degree. For all other students, the time limit for a doctoral degree is seven years after completion of 24 graduate level credits at Stony Brook University.

- In exceptional cases where the program cannot be completed within these periods, students may petition for an extension of the time limit.
- Petitions may be in letter form and require the approval of the student's advisor and Graduate Program Director.
- Requests for a time limit extension must be filed before the limit is exceeded and must contain a significant justification.
- The final decision rests with the Dean of the Graduate School, who may impose additional requirements.

The Doctor of Arts and the Doctor of Musical Arts

The degrees of Doctor of Arts and Doctor of Musical Arts are the only nonclinical doctoral degrees offered at Stony Brook other than the Ph.D. The fundamental requirements for the D.A. and the D.M.A. are essentially those for the Ph.D. with the exception that the scope of the original work and the scale of the research are somewhat reduced. The requirements for expertise within the subject area and for clear exposition are equal to those for the Ph.D. In the case of the D.A., a dissertation is required, but for the D.M.A., clarity of exposition is demonstrated through the medium of recital.

The Doctor of Arts Degree in Foreign Languages

Admission to the Graduate School does not automatically qualify a student as a candidate for the D.A. degree. Formal recommendation of advancement to candidacy for the D.A. degree must be made to the Graduate School by the program after a review of the student's performance in courses, independent study, and program examinations. A candidate for the D.A. degree engages in a creative research project leading to a dissertation. The requirements below are the minimal ones mandated by the Graduate School. Individual graduate programs may set additional requirements.

A. Courses and Grade Point Average

The student will follow an approved program of courses determined to meet his or her needs and to satisfy program requirements.

- A student must achieve a minimum 3.0 overall GPA in all graduate courses taken at Stony Brook in order to receive a doctoral degree.
- At the written request of the new program, the record of a student who has changed his or her registered area of graduate studies may be treated as two separate records for the purposes of meeting degree requirements. The GPA for the new area of graduate studies may be calculated unofficially from the beginning of the semester in which the change became effective.

B. Language Proficiency

The student must have a master's degree or its equivalent with specialization in one of the following languages: French, German, Italian, Russian, Spanish, or TESOL.

C. Practicum

Successfully teaching an elementary or intermediate course in the area of graduate studies is required.

D. Internship

Team teaching a course in literature, advanced language, or culture for one semester is required.

E. Externship

Full-time teaching for one semester (three courses) at the secondary or college level is required.

F. Comprehensive Examination

The final evaluation includes both a written and an oral comprehensive examination and includes topics from all areas covered in the program.

- The comprehensive examination is administered only after the candidate has demonstrated verbal fluency in the target language and competence in language instruction and methodology.
- A doctoral committee will test the verbal fluency of all candidates.
- It is the responsibility of the candidate to prepare a reading list to cover individual specialties after consulting with major and minor advisors. This list must be submitted and approved one semester prior to taking the comprehensive exam.

G. Advancement to Candidacy

A student may be advanced to candidacy when all Graduate School and program requirements other than the dissertation or its equivalent have been completed.

- Students on academic probation cannot be advanced to candidacy.
- Advancement to candidacy is granted by the Dean of the Graduate School upon recommendation of the Graduate Program Director.
- Students must be classified as a G4 at the time of request.
- Students must advance to candidacy one year (minimum two semesters) before the beginning of the semester in which they plan to defend their dissertation.

H. Dissertation

All doctoral candidates must complete a creative research project. The subject of the research project will be determined by the candidate's professional interest and training.

- The dissertation will be undertaken after the student has completed all coursework and has been reviewed by the doctoral committee, which will make the final determination for recommendation for conferral of the degree of Doctor of Arts in foreign language instruction.
- The dissertation must be prepared in accordance with the guidelines presented in the Guide to the Preparation of Theses and Dissertations available online at the Graduate School Web page.
- Multiple authorship of a dissertation is not permitted.

I. Dissertation Examining Committee

The dissertation must be approved by a dissertation examining committee of at least three faculty members of the program and one outside member, appointed by the Dean of the Graduate School.

- Included in the makeup of the committee is a dissertation supervisor, defense chairperson, a third member from the program, and at least one person outside the program or University.
- The outside member should have expertise in the student's research field so as to be able to understand, criticize, and contribute to the dissertation, as well as to judge the quality and significance of the research.
- The dissertation supervisor cannot serve as chairperson of the examining committee.

J. Dissertation Defense

Examination of the dissertation involves a formal oral defense. This event will be conducted by the dissertation committee and will not be chaired by the supervisor of the dissertation.

- The formal defense must be announced at least three weeks in advance and is open to all interested members of the University community.
- All candidates must provide the Graduate School will a dissertation abstract or recital program, as well as other relevant details, at least three weeks in advance of the proposed event. The Doctoral Defense Announcement form is available on the Graduate School Web page.
- All dissertation defenses shall take place on campus and require the full attendance of the dissertation examining committee. Any exceptions from this practice will require additional approval from the Dean of the Graduate School.
- The examination that follows the public defense may be either open to the public or closed, at the discretion of the Dissertation Examining Committee.
- The Graduate School will be responsible for advertising the defense to the University community.
- A student may register for no more than one additional semester following the successful defense of the dissertation.
- The signatures on a committee approval form, which appears on page ii of the student's dissertation, indicate approval of the defense of the dissertation itself.

K. Residence Requirement

At least two consecutive semesters of full-time graduate study in the program granting the degree are required. The purpose of the residence requirement is to ensure that the graduate student participates in the professional life of the program beyond class attendance. Some program residence requirements may vary from the Graduate School norm and are described in the individual program requirements. Unless specified, however, the Graduate School regulation takes precedence.

L. Degree Application

Students must apply for graduation online at the Graduate School Web page in accordance with published deadlines. If degree requirements are not met,

students must reapply for any subsequent awarding periods.

M. Registration

Students who intend to graduate in the spring or fall must register for at least one graduate credit. Students who intend to graduate in the summer can register for zero credits, but it still must be a graduate level course.

N. Program Recommendation

When all program requirements are completed, the Graduate Program Director may recommend to the Dean of the Graduate School that the D.A. degree be granted.

O. Time Limit

The time limit for the D.A. degree is seven years for a student who has a closely related previous graduate degree. For all other students, the time limit for a doctoral degree is seven years after completion of 24 graduate level credits at Stony Brook University.

- In exceptional cases where the program cannot be completed within these periods, students may petition for an extension of the time limit.
- Petitions may be in letter form and require the approval of the student's advisor and Graduate Program Director.
- Requests for a time-limit extension must be filed before the limit is exceeded and must contain a significant justification.
- The final decision rests with the Dean of the Graduate School, who may impose additional requirements.

The Doctor of Musical Arts Degree

Admission to the Graduate School does not automatically qualify a student as a candidate for the D.M.A. degree. Formal recommendation of advancement to candidacy for the D.M.A. degree must be made to the Graduate School by the program after a review of the student's performance in courses, independent study, and program examinations. The requirements listed below are the minimal ones mandated by the Graduate School. The graduate programs may set additional requirements.

A. Course and Grade Point Average

The student will follow a program of courses determined to meet his or her needs and to satisfy the program requirements.

- A student must achieve a minimum 3.0 overall GPA in graduate courses taken at Stony Brook in order to receive the D.M.A. degree.
- At the written request of the new program, the record of a student who has changed his or her registered area of graduate studies may be treated as two separate records for the purposes of meeting degree requirements. The GPA for the new area of graduate studies may be calculated unofficially from the beginning of the semester in which the change became effective.

B. Contract Toward Candidacy

The student must fulfill the specific requirements of an approved contract toward candidacy.

C. Language Proficiency

Although the Graduate School does not require proficiency in a foreign language, the program has responsibility for its own foreign language requirements and the evaluation of proficiency. Students must comply with their program requirements (see the Music section of the Graduate Bulletin).

D. Advancement to Candidacy

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

- Completion of three of the four public recitals;
- Completion of the two graduate seminars or proseminars required for the generation of doctoral essays and completion of two MUS 695 courses with a grade of B or better to work on revisions for each essay;
- Completion of requirements C through I of the Music section of the Graduate Bulletin.
- Students on academic probation cannot be advanced to candidacy.
- Advancement to candidacy is granted by the Graduate School upon recommendation of the departmental Graduate Program Director.
- Students must be classified as a G4 at the time of request.

E. Doctoral Recital

The student must demonstrate a distinguished level of performance in the doctoral recital. A cassette recording of the recital is to be kept permanently in the University library. In addition, an unofficial copy of the program must be submitted to the Graduate School.

F. Teaching

At least one semester of practicum in teaching under supervision is required. The form this practicum takes may differ by discipline.

- It might include making seminar or class presentations, leading discussion sections, or grading.
- Grading experience by itself will not be considered sufficient for satisfaction of the requirement.
- Faculty are responsible for providing informal feedback and formal evaluation.

G. Residence Requirement

At least two consecutive semesters of full-time graduate study in the program granting the degree are required. The purpose of the residence requirement is to ensure that the graduate student participates in the professional life of the program beyond class attendance. Some program residence requirements may vary from the Graduate School norm and are described in the individual program requirements for the degree. Unless specified, however, Graduate School regulation pertains.

H. Degree Application

The student must apply for admission online at the Graduate School Web page in accordance with published deadlines. If degree requirements are not met, students must reapply for any subsequent awarding periods.

I. Registration

Students who intend to graduate in the spring or fall must register for at least one graduate credit. Students who intend to graduate in the summer can register for zero credits, but it still must be a graduate level course.

J. Program Recommendation

When all program requirements are completed, the Graduate Program Director may recommend to the Dean of the Graduate School that the D.M.A. degree be granted.

K. Time Limit

The candidate must satisfy all requirements for the D.M.A. degree within seven years after completing 24 graduate level credits at Stony Brook University.

- In exceptional cases where the program cannot be completed within these periods, students may petition for an extension of the time limit.
- Petitions may be in letter form and

require the approval of the student's advisor and Graduate Program Director.

- Requests for a time-limit extension must be filed before the limit is exceeded and must contain a significant justification.
- The final decision rests with the Dean of the Graduate School, who may impose additional requirements.

The Master of Philosophy Degree

The degree of Master of Philosophy is intended as a formal recognition of what is informally known as "ABD" status. This degree is normally reserved for students who have advanced to candidacy in a Ph.D. program but are unable to complete the remaining requirements. The degree implies educational achievements well beyond those required for a regular master's degree.

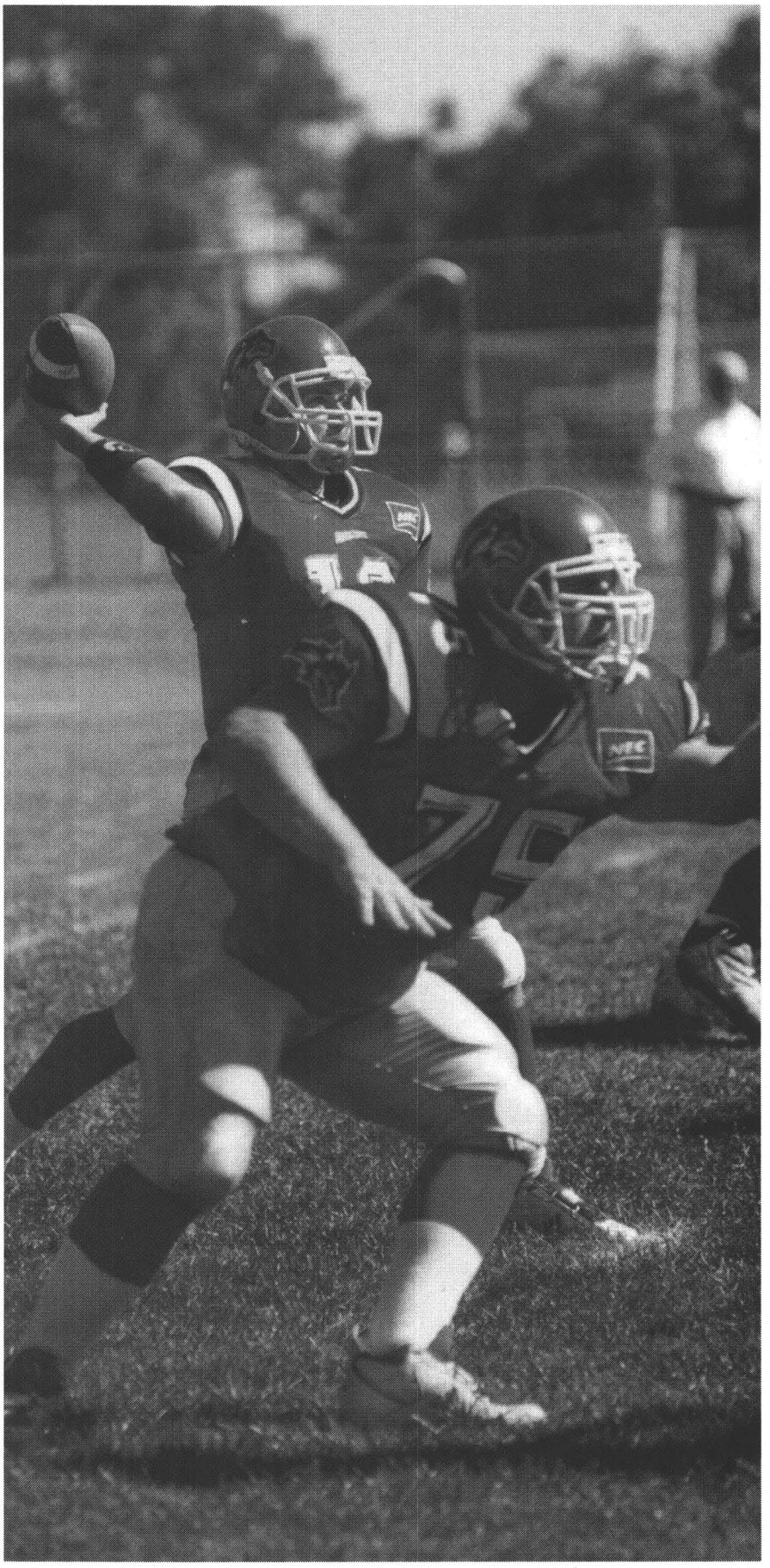
The Master of Philosophy degree is available in every program that awards the Ph.D. requirements for the M. Phil. are identical to those for the Ph.D., except that the submission and defense of the dissertation are not required.

Award of Degree

When all requirements have been completed, the Graduate Program Director will so certify to the Dean of the Graduate School and recommend that the degree be awarded. Degrees are awarded three times a year: May, August, and December. A formal ceremony, however, takes place only at the December and May commencements. To be eligible for a degree, a student must have completed all University requirements, satisfied any provisional admission requirements, submitted the appropriate manuscripts, obtained all University clearances, and have maintained matriculation according to the regulations outlined under the section "Maintaining Matriculated Status," elsewhere in this Bulletin.

Waiver of Regulations

The Dean of the Graduate School in individual instances may waive specified requirements. A petition for such a waiver must be endorsed by the Graduate Program Director, who shall append the reasons for believing that requested waiver would not result in a breach of the spirit of the regulations.



Degrees and Advanced Graduate Certificates Awarded

Degrees and Advanced Graduate Certificates Awarded

The Graduate School at Stony Brook University offers graduate degrees through a number of departments and programs. Graduate curricula at Stony Brook are grouped below by the graduate degree programs that have been approved and registered with System Administration of the State University of New York and the State Education Department. All graduate degrees are awarded in the name of the program. Some of the degrees listed have concentrations below them (in italics). These refer to an approved and regulated curriculum within the graduate program organized to focus on an area of special interest. The codes shown in this list are abbreviations for the disciplines in which a student can receive a degree or advanced graduate certificate; they are designators for courses offered by the program.

The list below does not include graduate degrees offered by the School of Dental Medicine, School of Medicine, School of Nursing, School of Health Technology and Management, and School of Professional Development.

Graduate Programs (Codes)

Anatomical Sciences (HBA)
Ph.D. in Anatomical Sciences

Interdepartmental Doctoral Program in Anthropological Sciences (DPA)
Ph.D. in Anthropology
Archaeology
Cultural Anthropology
Physical Anthropology

Anthropology (ANT)
M.A. in Anthropology
Archaeology
Physical Anthropology
Socio-Cultural Anthropology

Applied Mathematics and Statistics (AMS)
M.S. and Ph.D. in Applied Mathematics and Statistics
Biomathematical Modeling
Computational Applied Mathematics
Operations Research
Statistics
Advanced Graduate Certificate in Operations Research

Art (ARH, ARS)
M.A. and Ph.D. in Art History and Criticism
M.F.A. in Studio Art
Advanced Graduate Certificate in Art and Philosophy

Biochemistry and Structural Biology (BSB)
Ph.D. in Biochemistry and Structural Biology

Biomedical Engineering (BME)
M.S. and Ph.D. in Biomedical Engineering
Advanced Graduate Certificate in Biomedical Engineering

Chemistry (CHE, TCH)
M.S. and Ph.D. in Chemistry
Chemical Biology
Chemical Physics
Chemistry

Comparative Literature (CLG)
M.A. and Ph.D. in Comparative Literature
Certificate in Cultural Studies

Computer Science (CSE)
M.S. and Ph.D. in Computer Science

Ecology and Evolution (BEE)
M.A. in Biological Sciences
Applied Ecology
Ph.D. in Ecology and Evolution

Economics (ECO)
M.A. and Ph.D. in Economics

Education
M.A.T. Adolescence Education: Biology (TBI)
M.A.T. Adolescence Education: Chemistry (TCH)
M.A.T. Adolescence Education: Earth Science (TES)
M.A.T. Adolescence Education: English (TEN)
M.A.T. Adolescence Education: French (TFR)
M.A.T. Adolescence Education: German (TGR)
M.A.T. Adolescence Education: Italian (TIL)
M.A.T. Adolescence Education: Mathematics (TMA)
M.A.T. Adolescence Education: Physics (TPH)
M.A.T. Adolescence Education: Russian (TRU)

Electrical and Computer Engineering (ESE)
M.S. and Ph.D. in Electrical Engineering

English (EGL, TEN)
M.A. and Ph.D. in English

European Languages, Literatures, and Cultures (GER, RLF, RLI, SLV, DLG, DLF, DLI, DLL, DLR)
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)

Genetics (BGE)
Ph.D. in Genetics

Geosciences (GEO)
M.S. and Ph.D. in Geosciences

Hispanic Languages and Literature (SPN)
M.A. and Ph.D. in Hispanic Languages and Literature

History (HIS)
M.A. and Ph.D. in History

Linguistics (LIN, ESL)
M.A. and Ph.D. in Linguistics
M.A. in Teaching English to Speakers of Other Languages (TESOL)
D.A. in Foreign Languages

Management and Policy (MGT)
Advanced Graduate Certificate in Health Care Management
Advanced Graduate Certificate in Information Systems Management
Business Management
Government Management
Advanced Graduate Certificate in Human Resource Management
Nonprofit Management
Technology Management
M.S. in Health Care Policy and Management
M.S. in Technology Management

Marine Sciences (MAS)
M.S. and Ph.D. in Marine and Atmospheric Sciences
Marine Sciences
Atmospheric Sciences
Advanced Graduate Certificate in Oceanic Science
Advanced Graduate Certificate in Waste Management

Materials Science and Engineering (ESM)
M.S. and Ph.D. in Materials Science and Engineering

Mathematics (MAT)
M.A. in Mathematics 7-12
M.A. and Ph.D. in Mathematics

Mechanical Engineering (MEC)
M.S. in Mechanical Engineering
Manufacturing
Ph.D. in Mechanical Engineering
Mechanical Design
Solid Mechanics
Thermal Sciences and Fluid Mechanics

Molecular and Cellular Biology (MCB)
Ph.D. in Molecular and Cellular Biology
Biochemistry and Molecular Biology
Cellular and Developmental Biology
Immunology and Pathology

Molecular Genetics and Microbiology (HBM)
Ph.D. in Molecular Genetics and Microbiology

Music (MUA, MUP)
M.A. and Ph.D. in Music
Composition
Music History
Music Theory
M.M. and D.M.A. in Music Performance

Neuroscience (BNB)
Ph.D. in Neurobiology and Behavior

Optoelectromechanical Systems Engineering
M.S. in Optoelectromechanical Systems Engineering

Oral Biology and Pathology (BHS, HDO)
M.S. and Ph.D. in Oral Biology and Pathology

Pharmacological Sciences (HBH)
Ph.D. in Molecular and Cellular Pharmacology

Philosophy (PHI)
M.A. and Ph.D. in Philosophy
Advanced Graduate Certificate in Art and Philosophy

Physics and Astronomy (PHY)
M.A. in Physics
M.S. in Physics
Ph.D. in Physics
Biophysics
Chemical Physics

Physiology and Biophysics (HBY)
Ph.D. in Physiology and Biophysics

Political Science (POL)
M.A. in Political Science
M.A. in Public Policy
Ph.D. in Political Science
American Politics
Political Economy and Public Policy
Political Psychology/Behavior

Psychology (PSY, BIP, CLP, EXP, SCP)
M.A. in Psychology (PSY)
Ph.D. in Biopsychology (PSY)
Ph.D. in Clinical Psychology (PSY)
Ph.D. in Experimental Psychology (PSY)
Ph.D. in Social/Health Psychology (PSY)

Social Welfare
Ph.D. in Social Welfare

Sociology (SOC)
M.A. and Ph.D. in Sociology

Software Engineering
Advanced Graduate Certificate in Software Engineering

Technology and Society (EST)
M.S. in Technological/Systems Management
Educational Computing
Environmental and Waste Management
Global Industrial Management
Advanced Graduate Certificate in Educational Computing
Advanced Graduate Certificate in Industrial Management
Advanced Graduate Certificate in Computer Integrated Engineering

Theatre Arts (THR, DRM)
M.A. in Theatre
M.F.A. in Dramaturgy

Women's Studies (WNS)
Advanced Graduate Certificate in Women's Studies

Writing and Rhetoric (WRT)
Advanced Graduate Certificate in Composition Studies

Degree and Advanced Graduate Certificate Program Descriptions

Anatomical Sciences (HBA)

Chairperson: Jack T. Stern, Health Sciences Center T-8, Room 040 (631) 444-3128
Graduate Program Director: Catherine A. Forster, Health Sciences Center T-8, Room 088 (631) 444-8203
Staff Associate: Christine Johnson, Health Sciences Center T-8, Room 040 (631) 444-3114

Degree awarded: Ph.D. in Anatomical Sciences

Multidisciplinary Graduate Program in Anatomical Sciences

The Department of Anatomical Sciences, within the Health Sciences Center, offers a multidisciplinary graduate program leading to the Ph.D. degree. Students receive comprehensive training to prepare them for teaching and research in the areas of evolutionary morphology, functional morphology, musculoskeletal biology, and vertebrate paleontology. Graduate students are guided through a program of courses appropriate to their particular needs. In this regard, the Department of Anatomical Sciences interacts with other departments in the School of Medicine as well as those in the College of Arts and Sciences (e.g., Anthropology, Geosciences, and Ecology and Evolution departments).

The program is concerned with the analysis and interpretation of gross vertebrate structure in relation to adaptation and systematics. Training and research focus on (a) an evolutionary perspective in the analysis of morphology, including the influences of function, structure, and phylogenetic history, and (b) the structural adaptations of bone as a load-bearing tissue, including the physiologic mechanisms of osteogenesis and osteolysis. Both the locomotor and the craniodental systems are regions of current interest and investigation within the program. Emphasis is placed on the application of experimental and quantitative techniques to the analysis of the relationship between form and function. Studies of skeletal adaptations focus around a collaboration with the Musculoskeletal Research Laboratory of the Department of Orthopaedics. Questions of systematics are approached at many different levels, ranging from alpha taxonomy to higher-order relationships utilizing such techniques as quantitative cladistics, as well as more traditional taxonomic methods. Students in the program have the opportunity to master a variety of research methods and analytical strategies: electromyography, cineradiography, kinematics and kinetics, in vivo bone strain measurement, finite element analysis, quantitative morphology including scaling (allometry) and multivariate morphometrics, systematic classification techniques, scanning electron microscopy and tandem-scanning, reflected-light microscopy, behavioral ecology, and principles of paleontological fieldwork.

Facilities

The department has exceptionally well-equipped research facilities. These include a primate colony and all the apparatus necessary for telemetered electromyography; cinematographic and cineradiographic motion analysis equipment; force-plate; scanning and transmission electron microscopes; tandem-scanning, reflected-light microscope; three-dimensional reflex microscope; two-dimensional and three-dimensional sonic digitizers; original fossil collections; extensive cast collection; paleontological field projects in the western interior of North America, China, Africa, and Madagascar. In addition, the program offers extensive microcomputing and excellent mainframe computing facilities.

Admission

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

A. A bachelor's degree with the following minimal preparation: mathematics through one year of calculus; chemistry, including organic chemistry; general physics; and one year of biology with laboratory;

B. A minimum grade point average of 3.0 in all undergraduate coursework and 3.25 in science courses;

C. Letters from three previous instructors;

D. Results of the Graduate Record Examination (GRE) General Test and TOEFL for international students;

E. Acceptance by the Department of Anatomical Sciences and by the Graduate School.

In special cases, students not meeting requirements A through D may be admitted on a provisional basis. These students must act to remedy deficiencies within the first year, following the requirements of the individual graduate studies.

Faculty

Distinguished Professor

Fleagle, John G., Ph.D., 1976, Harvard University: Evolutionary biology of higher primates; vertebrate paleontology; behavioral and experimental analysis of comparative musculoskeletal anatomy; skeletal growth and development.

Professors

Brink, Peter R.[2], Ph.D., 1976, University of Illinois: Physiology and biophysics of junctional and excitable membranes.

Demes, A. Brigitte, Ph.D., 1982, University of Bochum, Federal Republic of Germany: Biomechanics; functional morphology; scaling effects on locomotion.

Grine, Federick E.[1], Ph.D., 1984, University of Witwatersrand, South Africa: Hominid evolution; functional morphology of the masticatory system; vertebrate paleontology; dental structure and comparative odontology.

Jungers, William L., Ph.D., 1976, University of Michigan: Paleoanthropology; comparative primate anatomy; biomechanics; primate paleontology and systematics.

Krause, David W., Ph.D., 1982, University of Michigan: Vertebrate paleontology; mammalian evolution; functional morphology of masticatory and locomotor systems.

Larson, Susan G., Ph.D., 1982, University of Wisconsin: Functional morphology of human and nonhuman primate locomotor systems; human and primate evolution; telemetered electromyography.

Martin, Lawrence B., *Dean of the Graduate School.*[1] Ph.D., 1983, University of London, England: Primate evolution; thickness, development, and microstructure of dental enamel; neogene vertebrate paleontology.

Rubin, Clinton T.[3], Ph.D., 1982, Bristol University, England: Structural adaptation in bone; skeletal remodeling and morphology.

Stern, Jack T., Jr., *Chairperson.* Ph.D., 1969, University of Chicago: Functional gross morphology; relationship between primate locomotor

behavior and structure; human muscle function in relation to athletic activity and orthopaedics; radiotelemetered electromyography.

Susman, Randall L., Ph.D., 1976, University of Chicago: Functional morphology and behavior of primates; evolution of apes and humans; gross anatomy.

Associate Professor

Doran, Diane M.[1], Ph.D., 1989, Stony Brook University: Behavior and ecology of African apes; relationship of positional behavior and morphology.

Forster, Catherine A., Ph.D., 1990, University of Pennsylvania: Vertebrate paleontology; systematics; functional morphology.

Assistant Professors

O'Leary, Maureen A., Ph.D., 1997, Johns Hopkins University: Vertebrate paleontology; phylogenetic systematics; mammalian evolution.

Adjunct Faculty

Jouffroy, Francoise K., Ph.D., 1962, Université de Paris: Comparative vertebrate anatomy; functional morphology of locomotion; histochemistry and immunohistochemistry of muscle.

Leakey, Maeve, Ph.D., 1968, University of North Wales: Evolution of hominoids; evolution of Late Cenozoic faunas in East Africa.

Mittermeier, Russell, Ph.D., 1977, Harvard University: Ecology and behavior of primates; primate conservation.

Number of teaching, graduate, and research assistantships, fall 2003: 4

1) Joint appointment, Department of Anthropology

2) Joint appointment, Department of Physiology

3) Joint appointment, Department of Biomedical Engineering

Degree Requirements

M.S. Degree Requirements

Graduate Studies in Anatomical Sciences does not accept students whose goal is a master's degree. In exceptional instances, a student already in the program may be awarded an M.S. degree upon completing an approved course of study, including a minimum of 30 graduate credit hours, and either passing a comprehensive examination, or submitting and defending a master's thesis.

Requirements for the Ph.D. Degree

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

A. Formal Course Requirements

The following courses are required for all students in the program:

1. Human Gross Anatomy and Embryology
2. An approved course in Statistics

In addition, students are required to take three courses chosen in consultation with the student's advisor from the following list:

1. Molecules, Genes, and Cells
2. Organ Systems
3. Neurosciences
4. Functional Morphology or Animal Mechanics
5. Vertebrate Evolution
6. Principles of Evolution or Macroevolution

Depending on the area of specialization, students may be required to take additional courses, such as Solid Mechanics, Mammalian Evolution, or Biomedical Engineering.

All students must achieve a B or higher in all required courses and must maintain a B average or higher in all elective courses.

B. Preliminary Examination

All students are required to take an oral preliminary examination upon completion of formal courses, normally at the beginning of their fourth semester. All students will be examined in human gross anatomy and embryology. The third subject will depend on the students area of specialization, such as musculoskeletal biology, neuroanatomy, or vertebrate evolution.

C. Advancement to Candidacy

The faculty will recommend a student to the Graduate School for advancement to candidacy upon satisfactory completion of all required coursework and the preliminary examination. The student then becomes a formal candidate for the Ph.D.

D. Dissertation Proposal Examination

Following advancement to candidacy, the student selects a dissertation advisor and committee consisting of at least two additional members of the Department of Anatomical Sciences and one person from outside the department. In consultation with this committee, the student prepares a dissertation proposal. The dissertation proposal examination consists of an oral presentation of this proposal to the department as a whole, followed by an oral defense before the dissertation committee. This examination should occur no later than 12 months after passing the oral preliminary examination.

E. Ph.D. Dissertation

The student, under the supervision of the dissertation committee, performs the research leading to the preparation of a written dissertation. The dissertation must contain the results of original and significant investigation.

F. Dissertation Defense

Following completion of the dissertation, the student presents his or her findings in a formal public oral defense. The defense is conducted by the dissertation committee, but is not chaired by the student's advisor. Following the presentation of results, the student is questioned by members of the committee and by other members of the audience.

G. Teaching Requirement

Every student is required to teach medical human gross anatomy (HBA 531) at least once before graduation. In addition, students receiving a teaching assistantship are required to teach.

H. Residence Requirement

The University requires at least two consecutive semesters of full-time graduate study. Generally, the demands of the course of study necessitate a longer period of residence. However, pursuit of a degree on a part-time basis will be considered under special circumstances.

Courses

HBA 521 Gross Anatomy of Head, Neck, and Trunk
Tutorial laboratories with emphasis on dissections of the human head, neck, and trunk.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall, 8 credits, ABCF grading

HBA 531 The Body
A lecture and laboratory with emphasis on dissection of the entire human body. Topics include functional and topographic anatomy, embryology, clinical correlations, and an introduction to radiology.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall, 8 credits, S/F grading

HBA 536 Biological Clocks
An in-depth consideration of the temporal dimension of biological organization and of the cellular and molecular timekeeping mechanisms characteristic of living systems. Topics include a survey of circadian rhythms and their properties in eukaryotic systems, cell cycle clocks, the quest for anatomical loci, dissection of clocks by chemicals and molecular genetic techniques, entrainment

and coupling pathways, biochemical and molecular models of circadian oscillators, pacemaker dysfunction, cellular aspects of chronopharmacology and chronotherapy, and cellular clocks in development and aging. This course is offered as HBA 536, MCB 536 and CEB 513. Note: Prior to start of class, students are advised to contact instructor via e-mail at *Leland.Edmunds@stonybrook.edu.*

Prerequisites: Matriculation in graduate program or permission of instructor; admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HBA 537 Physiology and Biochemistry of the Cell Cycle
An integrated view of the cell cycle in prokaryotes and eukaryotes. Topics considered include cell cycle anatomy, cell population dynamics, general patterns of biosynthesis, regulation of enzyme activity during the cell cycle, temporal control of gene expression, development and function of cellular organelles during the cell cycle, cell cycle clocks, the cyclin oscillator, the control of cell division, and the role of the cell cycle in cancer, apoptosis, and aging. Note: Prior to start of class, students are advised to contact instructor via e-mail at *Leland.Edmunds@stonybrook.edu.*

Prerequisites: Matriculation in graduate program or permission of instructor; admission to graduate Health Sciences Center program
Fall, 3 credits, ABCF grading

HBA 540 Human Anatomy for Physical Therapists
Lecture followed by laboratory dissection of the human body. Regional approach to the gross anatomy of the human body for physical therapy graduate students (DPT). The course is presented in three modules. Module one covers the back, thorax, abdomen, pelvis and perineum. Lectures will cover the regional anatomy of the above as well as conceptual information about the peripheral nervous system, the heart and respiratory system. Module two covers the brain, head and neck. Lecture will address the anatomy and organization of the central nervous system, the cranial nerves, introduction to the anatomy of the special senses and mastication. Module three will offer an expanded view of the functional anatomy of the limbs and musculoskeletal system. Lectures will address the functional anatomy of the hand and the foot as well as posture and locomotion. In module three clinical faculty will address the latest developments in radiology and skeletal imaging, and the clinical anatomy of the back, shoulder, elbow, hand, hip, knee, and foot.

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

HBA 541 Evolutionary Anatomy
A lecture and laboratory with emphasis on dissection of the entire human body. Includes functional and comparative anatomy with special emphasis on the musculoskeletal morphology of humans and higher primates. This course is offered as both DPA 541 and HBA 541.

Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
Fall, 8 credits, ABCF grading

HBA 550 Vertebrate Evolution
Survey of the fossil record of vertebrate evolution. The course emphasizes the origin, phylogeny, comparative and functional morphology, biogeography, and paleontology of vertebrate animals. Laboratory included. The lectures and laboratories will utilize an extensive collection of comparative anatomical material, fossil casts, and slides.

Prerequisite: Previous course in human or vertebrate anatomy and permission of instructor; admission to graduate Health Sciences Center program
Spring, alternate years, 4 credits, ABCF grading

HBA 560 Advanced Regional Anatomy
Advanced human gross anatomy for graduate students or advanced undergraduates in biology, anthropology and other life sciences.

Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
Fall, summer, and spring, 3-8 credits, ABCF grading

HBA 563 Aspects of Animal Mechanics
An introduction to biomechanics. Covers freebody mechanics and kinetics as applied to vertebrate locomotion. Considers the structure and physiology of muscle as it relates to adaptations of the musculoskeletal system. This course is offered as both HBA 563 and DPA 563.

Prerequisites: Introductory physics and biology or permission of instructor; admission to graduate Health Sciences Center program
Spring, odd years, 2 credits, ABCF grading

HBA 564 Primate Evolution
The taxonomic relationships and evolutionary history of primates as documented by their fossil record and structural and chemical evidence. Emphasis on primates prior to the origin of the human lineage. This course is offered as ANT 564, DPA 564 and HBA 564.

Prerequisite: Admission to graduate Health Sciences Center program
Spring, even years, 4 credits, ABCF grading

HBA 565 Human Evolution
A survey of the fossil record of hominid evolution through the Pliocene and Pleistocene with emphasis on the morphological structure and function of locomotor, masticatory, and neutral systems. Includes utilization of comparative anatomical material and extensive cast and slide collections. This course is offered as ANT 565, DPA 565 and HBA 565.

Prerequisite: Admission to graduate Health Sciences Center program
Fall, even years, 4 credits, ABCF grading

HBA 566 Studies in Functional Morphology
Introduction to the theory and methods of functional morphology. Various methods of analysis and the application of experimental techniques such as electromyography or bone strain analysis are discussed as they pertain to the understanding of the interaction between form and function. Special emphasis is placed on the analysis of human and nonhuman primate morphology, and the application of this analysis to interpretation of the fossil evidence for human and nonhuman primate evolution. This course is offered as both HBA 566 and DPA 566.

Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Spring, even years, 2 credits, ABCF grading

HBA 580 Comparative Anatomy and Evolution of Mammals
The comparative anatomy, evolutionary history, and radiation of fossil and living mammals. A course requiring a major research project on any aspect of mammalian comparative anatomy. Supplemented by lectures and seminars on the evolutionary history and radiation of mammals. Comparative osteological and fossil cast collections are utilized. This course is offered as both HBA 580 and DPA 580. Lecture/seminar series can be taken separately as DPA/HBA 581.

Prerequisites: Previous course in human or vertebrate anatomy and permission of instructor; admission to graduate Health Sciences Center program
Spring, alternate years, 4 credits, ABCF grading

HBA 581 Evolution of Mammals
A course on the evolutionary history and radiation of mammals from the Mesozoic to the present from paleontological and anatomical perspectives. Particular emphasis is placed on the origin of mammals and the origin, evolution, and anatomical diversity of modern and extinct orders of mammals. This course is offered as both HBA 581 and DPA 581.

Prerequisites: Previous course in human or vertebrate anatomy and permission of instructor; admission to graduate Health Sciences Center program
Spring, alternate years, 2 credits, ABCF grading

HBA 582 Comparative Anatomy of Primates
The comparative anatomy of living primates. Laboratory dissection with emphasis on relating structural diversity to behavior and biomechanics. This course is offered as both HBA 582 and DPA 582.

Prerequisites: HBA 364 and previous course in human or vertebrate anatomy and permission of instructor; admission to graduate Health Sciences Center program
Spring, alternate years, 4 credits, ABCF grading

HBA 590 Projects in Anatomical Sciences
Individual laboratory projects closely supervised by faculty members to be carried out in staff research laboratories.

Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall and spring, 1-6 credits, S/U grading
May be repeated twice for credit

HBA 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.
Prerequisites: matriculation in graduate program or permission of instructor; admission to graduate Health Sciences Center program
Spring, 4 credits, ABCF grading

HBA 690 Graduate Seminar
Seminars by graduate students on current literature in the areas of the anatomical sciences.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall and spring, 1 credit, S/U grading
May be repeated twice for credit

HBA 692 Advanced Topics in Anatomical Sciences Literature
Tutorial readings in anatomical sciences with periodic conferences, reports and examinations arranged with the instructor.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall and spring, 1-2 credits, S/U grading
May be repeated for credit

HBA 695 Practicum in Teaching
Practical instruction in the teaching of anatomical sciences carried out under faculty supervision.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
1-4 credits, S/U grading
May be repeated for credit

HBA 699 Dissertation Research on Campus
Original investigation under supervision of thesis adviser and committee.
Prerequisites: 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
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

HBA 800 Full-Time Summer Research
Full-time laboratory research projects supervised by staff members.
Prerequisites: Permission of instructor and full-time graduate student status; admission to graduate Health Sciences Center program
0 credits, S/U grading

Anthropological Sciences (DPA)

Director: Brigitte Demes, Health Sciences Center, T-08 (631) 444-3119
Graduate Secretary: Jean Moreau, Ward Melville Social and Behavioral Sciences Building, S-501 (631) 632-7606

Degree awarded: Ph.D. in Anthropology

Interdepartmental Doctoral Program in Anthropological Sciences

The Interdepartmental Doctoral Program in Anthropological Sciences (IDPAS), in the College of Arts and Sciences, is an interdisciplinary and interdepartmental program leading to the Ph.D. degree that draws upon faculty and resources from the departments of Anthropology, Anatomical Sciences, Ecology and Evolution, Geosciences, Art History, Africana Studies, and Asian Studies. The goal of the IDPAS is to train students for careers in research and teaching in physical anthropology, archaeology, and cultural anthropology.

Students in the Ph.D. program who have already been advanced to candidacy may, upon petition, receive a master's degree without submitting a master's thesis.

Facilities and Research Opportunities

Extensive laboratory space as well as desk space is available for all graduate students. The archaeology and physical anthropology labs housed in the Department of Anthropology provide facilities for the analysis of artifact collections–especially stone tools and faunal remains, application of remote sensing and Geographic Information Systems (GIS), analysis of primate or human remains, and advanced electron microscopy (EM). Housed in the department are archaeological collections from Africa, the Near East, Long Island, and South America. A fully equipped preparation lab provides opportunities for state-of-the-art mineralized tissue research. Darkroom facilities are available for use by graduate students.

Outside of the Anthropology Department, interested students have access to the research facilities for comparative primate morphology, human anatomy, and human and primate evolution housed in the Department of Anatomical Sciences, which are at present unparalleled at any other institution. The collections include primate fossils; primate osteological material from Africa, Asia, and South America; and living nonhuman primates, including New and Old World monkeys and lemurs.

Also in the Department of Anatomical Sciences is a biomechanics lab that includes equipment and facilities for force-plate analysis, high-speed cinematography and cineradiology, as well as bone strain and telemetered electromyography. Scanning and transmission electron microscope facilities are available elsewhere on campus. Students have access to excellent libraries and collections and to campus computing services.

For students interested in anthropological research in the New York/Long Island area, there is a research room containing an expanding collection of documentary material. The Institute for Long Island Archaeology manages cultural resource survey and environmental impact statements for the area and provides equipment for survey, excavation, and data analysis.

The primatology faculty currently maintains active sites in South America, Central Africa, Madagascar, and Thailand. The archaeology faculty has active field sites in Ethiopia, Iraq, Long Island, South Africa, and Turkey. Paleontological field research is current in Ethiopia, Madagascar, Mali, North America, and South Africa. Ethnographic work is ongoing in sthe Caribbean, China, East Timor, Indonesia, Madagascar, and Spain. Students may be invited to participate in these projects.

Admission to the Ph.D. Program

Application procedures and requirements determined by Stony Brook University, as set forth in this bulletin, must be followed. Applications will be reviewed by the admissions committee of the IDPAS, and successful applicants will be considered for financial assistance through the award of a teaching assistantship (TA) by the TA committee of the IDPAS. All rules, regulations, and requirements of the Graduate School, Stony Brook University, must be satisfied in addition to those described in this section. Interested students should request information and application forms as early as possible, especially if they plan to apply for financial aid.

In addition to the admission requirements of the Graduate School, the IDPAS requires:

A. A bachelor's degree from an accredited college and a minimum grade point average of 3.0 (B) in all undergraduate coursework and 3.25 in the major field of concentration;
B. Results of the Graduate Record Examination (GRE) General Test;
C. Test of English as a Foreign Language for international students with a minimum score of 550;
D. Acceptance by the IDPAS and the Graduate School.

Faculty

Professors

Arens, W., Ph.D., 1970, University of Virginia: Social anthropology; conservation; Africa and the Mediterranean.

Chittick, William C., Ph.D., 1974, Tehran University, Iran: Comparative religious systems; Islam; Middle East.

Demes, Brigitte, *Graduate Program Director.* Ph.D., 1982, University of Bochum, Federal Republic of Germany: Biomechanics; functional morphology; allometry; primates.

Fleagle, John, Ph.D., 1976, Harvard University: Primate and human evolution; primate behavior; functional morphology; growth and development.

Gilmore, David, Ph.D., 1975, University of Pennsylvania: Complex societies, stratification, and peasant culture; Europe; Mediterranean.

Grine, Frederick E., Ph.D., 1984, University of the Witwatersrand, South Africa: Hominid evolution; functional morphology of the masticatory apparatus; diet reconstruction; dental anthropology; mineralized tissues.

Hicks, David, *Associate Provost.* D.Phil., 1972, Oxford University, England: Religion; Kinship; Southeast Asia.

Janson, Charles, Ph.D., 1985, University of Washington: Primate behavior and ecology; sociobiology; tropical ecology.

Jungers, William L., Ph.D., 1976, University of

Michigan: Primate and human evolution; functional morphology; biomechanics.

Krause, David W., Ph.D., 1982, University of Michigan: Evolution, form, and function of mammalian dentition; evolutionary history and paleobiology of early mammals, particularly primates.

Larson, Susan, Ph.D., 1982, University of Wisconsin, Madison: Functional morphology; primates; biomechanics.

Martin, Lawrence, *Dean of the Graduate School. Ph.D.,* 1983, University of London, England: Hominoid evolution; enamel thickness; enamel microstructure and development.

Stern, Jack T., Jr., Ph.D., 1969, University of Chicago: Functional morphology of primates; biomechanics of muscle.

Stone, Elizabeth C., Ph.D., 1979, University of Chicago: Old World archaeology; state formation; ancient economy and society; Near East.

Wright, Patricia C., Ph.D., 1985, City University of New York: Primate behavior and ecology; rainforest conservation; Madagascar.

Associate Professors

Bernstein, David J., Ph.D., 1988, State University of New York at Binghamton: New World archaeology; paleoecology; coastal societies; subsistence studies.

Doran, Diane M., Ph.D., 1989, Stony Brook University: Behavior and ecology of African apes; relationship of positional behavior and morphology.

Forster, Catherine A., Ph.D., 1990, University of Pennsylvania: Evolution of dinosaurs; paleobiogeography; mesozoic faunas.

Frank, Barbara, Ph.D., 1988, Indiana University: Mesoamerican and African Diaspora.

Koenig, Andreas, Ph.D., 1992, Georg-August University, Goettingen, Germany: Primate ecology and behavior; evolution of social behavior; Asia.

Ruf, Gregory A., Ph.D., 1994, Columbia University: History and anthropology; political and economic anthropology; theory and methodology; rural industrialization; transitions from socialism; East Asia, China, Overseas Chinese, Japan.

Shea, John J., Ph.D., 1991, Harvard University: Old World paleolithic archaeology; lithic analysis; Near East; Europe; Africa.

Assistant Professors

Borries, Carola, Ph.D., 1989, Georg-August University, Goettingen, Germany: Primate ecology and behavior, sociobiology; Asia.

Kramer, Karen, Ph.D., 1998, University of New Mexico: Life history theory; reproductive ecology; demography; household economics; evolution of human juvenility; cooperative breeding; Maya; MesoAmerica; Madagascar agriculturalists.

O'Leary, Maureen A., Ph.D., 1997, Johns Hopkins University: Origin of primates and anthropoids; vertebrate paleontology; mammalian systematics; functional morphology; pattern of evolution.

Rasbury, Troy, E., Ph.D., 1998, Stony Brook University: Sedimentary geochemistry; chronostratigraphy; geochronology.

Visiting Professor

Leakey, Richard, E.F., Sc.D., 1998, Stony Brook University: Wildlife conservation; human evolution.

Number of teaching assistants, fall 2003: 23

Number of graduate fellows, fall 2003: 5

Degree Requirements

Requirements for the Ph.D. Degree in Anthropology

For a full description of IDPAS requirements and deadlines, please request "IDPAS Rules, Regulations, Requirements, and Procedures" from the graduate secretary.

A. Course Requirements

Completion of a minimum of 48 graduate credits, maintaining a minimum 3.0 average in all graduate courses. Not more than four credits of SPD or equivalent coursework may be applied toward the satisfaction of DPAS course requirements.

1. Physical Anthropology: Required courses are (a) DPA 564 Primate Evolution, (b) DPA 565 Human Evolution, (c) DPA 567 Primate Behavior and Ecology. All three of these courses will form the basis of the Qualifying Examination. Other required courses toward completion of study in the Evolutionary Morphology track include (a) BEE 551 Principles of Evolution (BEE 561 Macroevolution may be substituted for BEE 551 with the permission of the faculty in the student's track), (b) BEE 552 Biometry (an equivalent statistics course, e.g., PSY 501 and PSY 502, may be substituted with permission of the physical anthropology faculty), and (c) DPA 541 Human Evolutionary Anatomy. Students on the Primate Behavior track must take (1) BEE 551 Principles of Evolution, (2) BEE 552 Biometry (an equivalent statistics course, e.g., PSY 501 and PSY 502, may be substituted with permission of the physical anthropology faculty), and (3) BEE 550 Principles of Ecology or BEE 586 Evolutionary Ecology. Additional elective courses may be completed during the second and third years of study under the supervision of the Guidance Committee.

2. Archaeology: Required courses that form the basis of the qualifying examination are (a) ANT/DPA 515 Theory and Method in Archaeology, ANT/DPA 527 Field Methods and Techniques in Archaeology (or equivalent fieldwork) and a graduate-level Statistics Course; (b) two survey courses chosen from ANT/DPA 511 Paleolithic Archaeology, ANT/DPA 513 Origins of Agriculture, or ANT/DPA 512 Comparative Civilizations. Additional requirements include (a) two laboratory methods courses chosen from ANT/DPA 517 Lithic Technology, ANT/DPA 519 Archaeozoology, and ANT/DPA 526 Remote Sensing/GIS; (b) one seminar course chosen from ANT/DPA 510 Research Seminar in New World Archaeology, ANT/DPA 514 Research Seminar in Old World Prehistoric Archaeology, ANT/DPA 516 Research Seminar in Old World Historic Archaeology, ANT/DPA 518 Topics in Archaeology, ANT/DPA 620 Research Seminar in Topical Problems. Students must also take one elective IDPAS course outside the archaeology subdiscipline (e.g., ANT/DPA 565 Human Evolution).

3. Cultural Anthropology: Required courses that form the basis of the qualifying examination are (a) DPA 501 Development of Anthropological Theory, (b) DPA 540 Readings in Ethnography and Ethnology, and (c) DPA 520 Principles of Social and Cultural Anthropology. Other courses required for completion of the cultural anthropology program include (a) DPA 620 Research Seminar in Topical Problems, (b) DPA 640 Research Seminar in Ethnography and Ethnology, and (c) three additional credits of DPA 540 Readings in Ethnography and Ethnology. Other courses that may be taken at the discretion of the student's guidance committee include DPA 509 Seminar in European Ethnography, DPA 561 Peasant Societies and Cultures, and a statistics course.

B. Qualifying Exam

The qualifying examination must be taken after three semesters of study and passed at an appropriate level. The qualifying examination is administered to each student by the examination committee of the IDPAS. The examination takes the form of written or oral essays in one of the three fields of anthropological research (i.e., physical anthropology, archaeology, or cultural

anthropology) chosen by the student as his or her major field. The material covered in the qualifying examination comprises that covered in the courses specified above as well as that covered by the prescribed reading list for the selected field.

C. Language Requirement

The student must select the suitable language(s) necessary for the chosen field of specialization with the approval of the guidance committee. Language tests must be passed prior to advancement to candidacy. Language tests are administered by members of the IDPAS faculty, by special arrangements, or through standardized tests. Before recommending that a student be permitted to engage in fieldwork, the guidance committee may ask the student to demonstrate ability to speak the language required for fieldwork.

D. Preparation of Essay

The student must form an essay guidance committee comprising at least three members of the IDPAS faculty at the beginning of the second year of study. To do so, the student should consult with appropriate members of the faculty and submit a proposal to form a committee for consideration by the executive committee of the IDPAS. The essay guidance committee plans an appropriate course of study for the student and directs the preparation of the essay preliminary to the preparation of the dissertation proposal. Students should try to complete their essay during their first two years in the program.

E. Preparation of Dissertation Research Proposal

The dissertation proposal is prepared under the direction of the dissertation guidance committee (which may be the same as, or different from, the essay guidance committee in terms of IDPAS faculty membership), which is composed of at least three IDPAS faculty members and an external member. The dissertation proposal will be defended orally at a seminar open to the academic community and to which all IDPAS faculty and students are invited at least two weeks in advance. Students should aim to complete and defend their dissertation proposal during their third year in the program. Upon successful defense of the proposal, the student may be advanced to candidacy. The M.A. may be awarded at this point. Dissertation research, writing, and examination are supervised by the dissertation guidance committee.

F. Teaching Requirement

In accordance with Graduate School regulations, every student must gain some teaching experience. This may involve the presentation of a number of lectures in a course offered by a member of the IDPAS faculty. Upon advancement to candidacy, a student may be assigned greater teaching responsibility in the form of an undergraduate course to be prepared and taught under the supervision of a IDPAS faculty member. This arrangement will be made in consultation with the student and with the approval of the TA committee and the student's advisor. No student will be required to teach more than one course per year, and credit for teaching assignments will be given under the aegis of DPA 600.

G. Written Dissertation and Defense

The approval of a written thesis and its successful oral defense to the committee and the University community at large are required.

H. Time Limit

The candidate must satisfy all requirements for the Ph.D. degree within seven years after completing 24 credit hours of graduate courses at the Stony Brook University department or program in which the candidate is to receive his or her degree.

Courses

HBA 521 Gross Anatomy of Head, Neck, and Trunk

Tutorial laboratories with emphasis on dissections of the human head, neck, and trunk.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall, 8 credits, ABCF grading

HBA 531 The Body

A lecture and laboratory with emphasis on dissection of the entire human body. Topics include functional and topographic anatomy, embryology, clinical correlations, and an introduction to radiology.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall, 8 credits, S/F graded

HBA 536 Biological Clocks

An in-depth consideration of the temporal dimension of biological organization and of the cellular and molecular timekeeping mechanisms characteristic of living systems. Topics include a survey of circadian rhythms and their properties in eukaryotic systems, cell cycle clocks, the quest for anatomical loci, dissection of clocks by chemicals and molecular genetic techniques, entrainment and coupling pathways, biochemical and molecular models of circadian oscillators, pacemaker dysfunction, cellular aspects of chronopharmacology and chronotherapy, and cellular clocks in development and aging. This course is offered as HBA 536, MCB 536, and CEB 513. Note: Prior to start of class, students are advised to contact instructor via e-mail at *Leland.Edmunds@stonybrook.edu.*
Prerequisites: Matriculation in graduate program or permission of instructor; admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HBA 537 Physiology and Biochemistry of the Cell Cycle

An integrated view of the cell cycle in prokaryotes and eukaryotes. Topics considered include cell cycle anatomy, cell population dynamics, general patterns of biosynthesis, regulation of enzyme activity during the cell cycle, temporal control of gene expression, development and function of cellular organelles during the cell cycle, cell cycle clocks, the cyclin oscillator, the control of cell division, and the role of the cell cycle in cancer, apoptosis, and aging. Note: Prior to start of class, students are advised to contact instructor via e-mail at *Leland.Edmunds@stonybrook.edu.*
Prerequisites: Matriculation in graduate program or permission of instructor; admission to graduate Health Sciences Center program
Fall, 3 credits, ABCF grading

HBA 540 Human Anatomy for Physical Therapists

Lecture followed by laboratory dissection of the human body. Regional approach to the gross anatomy of the human body for physical therapy graduate students (DPT). The course is presented in three modules. Module one covers the back, thorax, abdomen, pelvis and perineum. Lectures will cover the regional anatomy of the above as well as conceptual information about the peripheral nervous system, the heart and respiratory system. Module two covers the brain, head and neck. Lecture will address the anatomy and organization of the central nervous system, the cranial nerves, introduction to the anatomy of the special senses and mastication. Module three will offer an expanded view of the functional anatomy of the limbs and musculoskeletal system. Lectures will address the functional anatomy of the hand and the foot as well as posture and locomotion. In module three clinical faculty will address the latest developments in radiology and skeletal imaging, and the clinical anatomy of the back, shoulder, elbow, hand, hip, knee, and foot.
Prerequisite: Admission to graduate Health Sciences Center program
6 credits, ABCF grading

HBA 541 Evolutionary Anatomy
A lecture and laboratory with emphasis on dissection of the entire human body. Includes functional and comparative anatomy with special emphasis on the musculoskeletal morphology of humans and higher primates. This course is offered as both DPA 541 and HBA 541.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall, 8 credits, ABCF grading

HBA 550 Vertebrate Evolution
Survey of the fossil record of vertebrate evolution. The course emphasizes the origin, phylogeny, comparative and functional morphology, biogeography, and paleontology of vertebrate animals. Laboratory included. The lectures and laboratories will utilize an extensive collection of comparative anatomical material, fossil casts, and slides.
Prerequisites: Previous course in human or vertebrate anatomy and permission of instructor; admission to graduate Health Sciences Center program
Spring, alternate years, 4 credits, ABCF grading

HBA 560 Advanced Regional Anatomy
Advanced human gross anatomy for graduate students or advanced undergraduates in biology, anthropology and other life sciences.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall, spring, and summer, 3-8 credits, ABCF grading

HBA 563 Aspects of Animal Mechanics
An introduction to biomechanics. Covers freebody mechanics and kinetics as applied to vertebrate locomotion. Considers the structure and physiology of muscle as it relates to adaptations of the musculoskeletal system. This course is offered as both HBA 563 and DPA 563.
Prerequisites: Introductory physics and biology or permission of instructor; admission to graduate Health Sciences Center program
Spring, odd years, 2 credits, ABCF grading

HBA 564 Primate Evolution
The taxonomic relationships and evolutionary history of primates as documented by their fossil record and structural and chemical evidence. Emphasis on primates prior to the origin of the human lineage. This course is offered as ANT 564, DPA 564, and HBA 564.
Prerequisite: Admission to graduate Health Sciences Center program
Spring, even years, 4 credits, ABCF grading

HBA 565 Human Evolution
A survey of the fossil record of hominid evolution through the Pliocene and Pleistocene with emphasis on the morphological structure and function of locomotor, masticatory, and neutral systems. Includes utilization of comparative anatomical material and extensive cast and slide collections. This course is offered as ANT 565, DPA 565, and HBA 565.
Prerequisite: Admission to graduate Health Sciences Center program
Fall, even years, 4 credits, ABCF grading

HBA 566 Studies in Functional Morphology
Introduction to the theory and methods of functional morphology. Various methods of analysis and the application of experimental techniques such as electromyography or bone strain analysis are discussed as they pertain to the understanding of the interaction between form and function. Special emphasis is placed on the analysis of human and nonhuman primate morphology, and the application of this analysis to interpretation of the fossil evidence for human and nonhuman primate evolution. This course is offered as both HBA 566 and DPA 566.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Spring, even years, 2 credits, ABCF grading

HBA 580 Comparative Anatomy and Evolution of Mammals
The comparative anatomy, evolutionary history, and radiation of fossil and living mammals. A course requiring a major research project on any aspect of mammalian comparative anatomy. Supplemented by lectures and seminars on the evolutionary history and radiation of mammals. Comparative osteological and fossil cast collections are utilized. This course is offered as both HBA 580 and DPA 580. Lecture/seminar series can be taken separately as DPA/HBA 581.
Prerequisites: Previous course in human or vertebrate anatomy and permission of instructor; admission to graduate Health Sciences Center program
Spring, alternate years, 4 credits, ABCF grading

HBA 581 Evolution of Mammals
A course on the evolutionary history and radiation of mammals from the Mesozoic to the present from paleontological and anatomical perspectives. Particular emphasis is placed on the origin of mammals and the origin, evolution, and anatomical diversity of modern and extinct orders of mammals. This course is offered as both HBA 581 and DPA 581.
Prerequisites: Previous course in human or vertebrate anatomy and permission of instructor; admission to Graduate Health Sciences Center Program
Spring, alternate years, 2 credits, ABCF grading

HBA 582 Comparative Anatomy of Primates
The comparative anatomy of living primates. Laboratory dissection with emphasis on relating structural diversity to behavior and biomechanics. This course is offered as both HBA 582 and DPA 582.
Prerequisites: HBA 364 and previous course in human or vertebrate anatomy and permission of instructor; admission to graduate Health Sciences Center program
Spring, alternate years, 4 credits, ABCF grading

HBA 590 Projects in Anatomical Sciences
Individual laboratory projects closely supervised by faculty members to be carried out in staff research laboratories.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall and spring, 1-6 credits, S/U grading
May be repeated twice for credit

HBA 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.
Prerequisites: Matriculation in graduate program or permission of instructor; admission to graduate Health Sciences Center program
Spring, 4 credits, ABCF grading

HBA 690 Graduate Seminar
Seminars by graduate students on current literature in the areas of the anatomical sciences.
Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
Fall and spring, 1 credit, S/U grading
May be repeated twice for credit

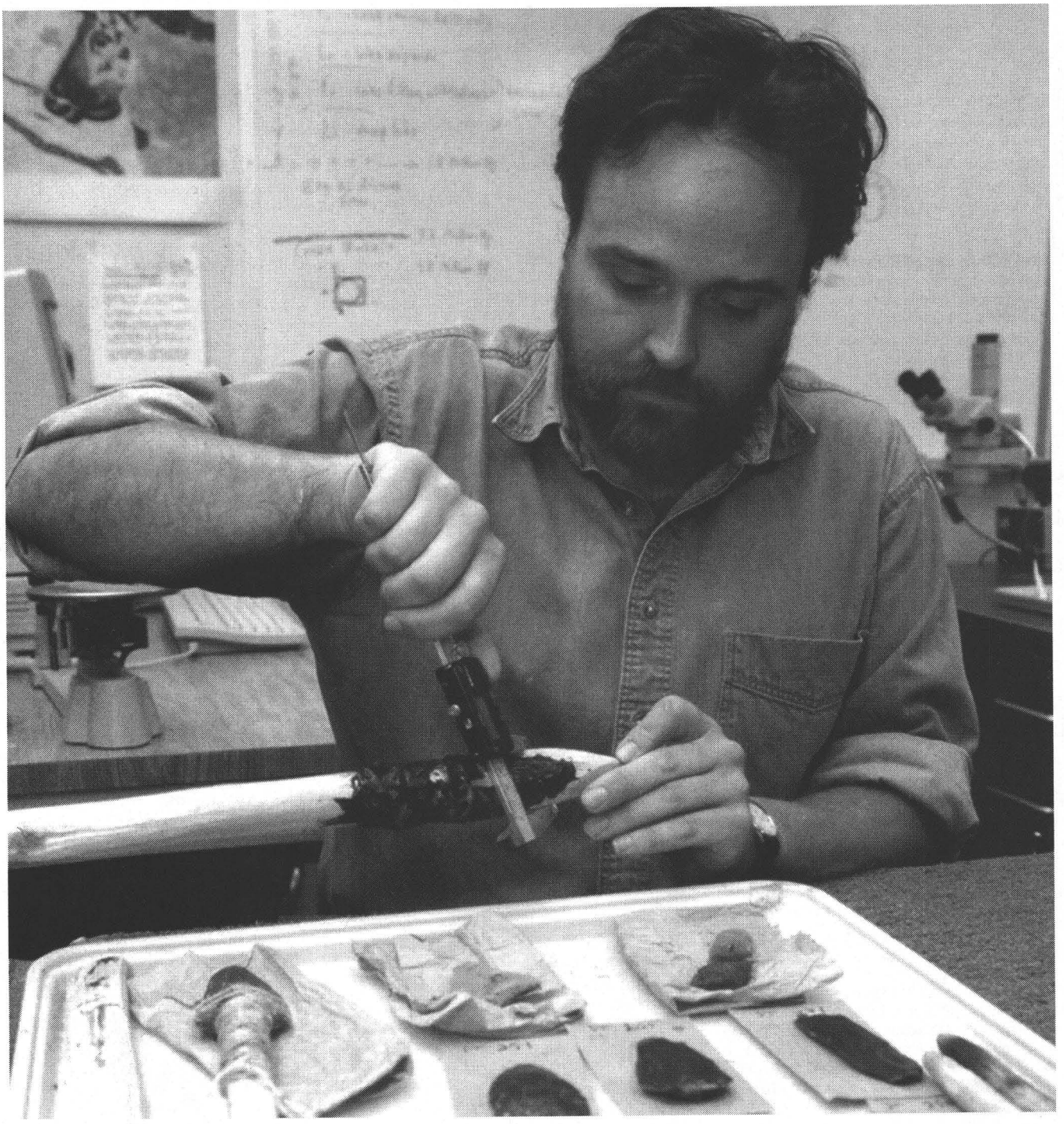
HBA 692 Advanced Topics in Anatomical Sciences Literature
Tutorial readings in anatomical sciences with periodic conferences, reports and examinations arranged with the instructor.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Fall and spring, 1-2 credits, S/U grading
May be repeated for credit

HBA 695 Practicum in Teaching
Practical instruction in the teaching of anatomical sciences carried out under faculty supervision.
Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
1-4 credits, S/U grading
May be repeated for credit

HBA 699 Dissertation Research on Campus
Original investigation under supervision of thesis adviser and committee.
Prerequisites: 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
Fall, spring, and summer, 1-9 credits, S/U grading
May be repeated for credit

HBA 800 Full-Time Summer Research
Full-time laboratory research projects supervised by staff members.
Prerequisites: Permission of instructor and full-time graduate student status; admission to graduate Health Sciences Center program
0 credits, S/U grading
May be repeated for credit

Associate Professor John Shea has recently initiated an experimental program testing and quantifying the effectiveness of hypothetical Paleolithic stone spear points.



Anthropology (ANT)

Chairperson: Fred Grine, Ward Melville Social and Behavioral Sciences Building N-549 (631) 632-7622
Director of M.A. Program: Karen Kramer, Ward Melville Social and Behavioral Sciences Building N-555 (631) 632-1712
Graduate Secretary: Jean Moreau, Ward Melville Social and Behavioral Sciences Building S-501 (631) 632-7606

Degree awarded: M.A. in Anthropology

The Department of Anthropology, within the College of Arts and Sciences, offers a full graduate program leading to the M.A. degree. In the M.A. program candidates may study toward a master's in anthropology with a concentration in archaeology, socio-cultural anthropology, or physical anthropology. Admission and degree requirements are the same but the course of study differs. Students who complete their graduate studies with the M.A. degree are well prepared to enter a variety of fields.

Facilities and Research Opportunities

The archaeology and physical anthropology labs housed in the department provide facilities for the analysis of artifact collections–especially stone tools and faunal remains, application of remote sensing and Geographic Information Systems (GIS), analysis of primate or human remains, and advanced electron microscopy (EM). Housed in the department are archaeological collections from Africa, the Near East, Long Island, and South America. Darkroom facilities are available for use by graduate students.

For students interested in anthropological research in the New York/Long Island area, there is a research room containing an expanding collection of documentary material. The Institute for Long Island Archaeology performs cultural resource surveys and environmental impact statements for the area and provides equipment for survey, excavation, and data analysis.

Students may be invited to participate in ongoing research conducted by the faculty in North and South America, Africa, Madagascar, Europe and the Mediterranean, the Middle East, and Indonesia in fields ranging from behavioral ecology of primates to paleontology, archaeology, and ethnology.

M.A. in Anthropology

The M.A. Program in Anthropology is designed for students who wish to pursue anthropological training for careers in education, contract archaeology, health or applied social sciences, and for those whose undergraduate training did not prepare them for doctoral level work in Anthropology. Full-time or part-time attendance is possible. Students are expected to choose a specialization in archaeology, social/cultural anthropology or physical anthropology at the time of admission and will be assigned an advisor who will work with them to tailor an individualized plan of study. By the time they have completed 15 credits of graduate work, students are expected to request a guidance committee consisting of three faculty members, at least two of whom must be members of the Anthropology Department, who will guide them through the preparation of a thesis proposal and the completion of the M.A. thesis.

Admission

In addition to the admission requirements of the Graduate School, the Anthropology Department requires:

A. A bachelor's degree from an accredited college with a minimum grade point average of 3.0 (B) in all undergraduate coursework and 3.25 (3.0=B) in the major field of concentration;

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

C. Test of English as a Foreign Language for international students with a minimum score of 550;

D. Acceptance by the Department of Anthropology and the Graduate School.

Faculty

Professors

Arens, W., Ph.D., 1970, University of Virginia: Social anthropology; conservation; Africa and the Mediterranean.

Gilmore, David, Ph.D., 1975, University of Pennsylvania: Complex societies, stratification, peasant culture; Europe; Mediterranean.

Grine, Federick E., *Chairperson.* Ph.D., 1984, University of Witwatersrand, South Africa: Hominid evolution; functional morphology of the masticatory system; vertebrate paleontology; dental structure and comparative odontology.

Hicks, David, D.Phil., 1972, Oxford University, England: Religion; kinship, Southeast Asia.

Martin, Lawrence B., *Dean of the Graduate School.* Ph.D., 1983, University of London, England: Primate evolution; thickness, development, and microstructure of dental enamel; neogene vertebrate paleontology.

Stone, Elizabeth C., Ph.D., 1979, University of Chicago: Old World archaeology; state formation; ancient economy and society; Near East.

Wright, Patricia C., Ph.D., 1985, City University of New York: Primate behavior and ecology; rain forest conservation; Madagascar.

Associate Professors

Bernstein, David J., Ph.D., 1988, University at Binghamton: New World archaeology; paleoecology; coastal societies; subsistence studies.

Doran, Diane M., Ph.D., 1989, Stony Brook University: Behavior and ecology of African apes.

Koenig, Andreas, Ph.D., 1992, University of Göttingen, Germany: Primate behavioral ecology.

Shea, John J., Ph.D., 1991, Harvard University: Old World paleolithic archaeology; lithic analysis; Near East; Europe; Africa.

Assistant Professors

Borries, Carola, Ph.D., 1989, University of Göttingen, Germany: Primate behavioral ecology.

Kramer, Karen L., Ph.D., 1998, University of New Mexico: Cultural and behavioral ecology; comparative demography; hunter-gatherer/agriculturalist comparative studies.

Degree Requirements

Requirements for the M.A. in Anthropology with Concentrations in Archaeology, Social/Cultural Anthropology, and Physical Anthropology

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

A. Completion of a minimum of 30 graduate credits, maintaining a 3.0 average;

B. A course of study planned and carried out with the approval of the student's M.A. guidance committee (this may require examinations, library research, laboratory study, and/or fieldwork as the basis of the M.A. thesis, which must be accepted by a committee appointed by the program—no final defense is required);

C. Minimum residence of one year.

The requirements for the three tracks in Anthropology differ, but students may take courses in the other sub-disciplines as electives. The requirements are as follows:

Archaeology	Credits
1. ANT 515 Theory and Method in Archaeology	4
2. ANT 527 Field Methods and Techniques in Archaeology*	6
3. Graduate Statistics Course (Approved by Committee)	3
4. ANT 599 M.A. Thesis Research	6
5. Electives chosen from among ANT 510, 511, 512, 513, 514, 516, 517, 518, 519, 526, and other courses offered in Anthropology, History, Ecology and Evolution, Marine Sciences or other programs chosen with the approval of the student's guidance committee.	10
Total	30

** In some instances equivalent courses may be accepted if they have been previously approved by the student's guidance committee.*

Social/Cultural Anthropology	Credits
1. ANT 520 Principles of Social and Cultural Anthropology	4
2. ANT 540 Readings in Ethnography and Ethnology	3
3. ANT 599 M.A. Thesis Research	6
4. Electives chosen from among ANT 500, 501, 509, 561, 602, 620, 640, and other courses offered in Anthropology, Sociology, Psychology, or other programs chosen with the approval of the student's guidance committee.	17
Total	30

Physical Anthropology	Credits
1. ANT 564 Primate Evolution	4
2. ANT 565 Human Evolution	4
3. ANT 567 Primate Behavior and Ecology	4
4. BEE 552 Biometry	4
5. ANT 599 M.A. Thesis Research	6
6. Electives chosen from among other courses in Anthropology, Ecology and Evolution, Anatomy or other programs chosen with approval of the student's guidance committee.	8
Total	30

Courses

ANT 500 Social and Cultural Anthropology
Study of the forms of social organizations: family, kinship, economic, political, and religious, as found among simple and complex societies. A basic graduate-level course designed for students whose previous background is in other fields.
Fall, 3 credits, ABCF grading
May be repeated for credit

ANT 501 Development of Anthropological Theory
Survey of the development of anthropological theory from the 19th century to the present. This course is offered as both ANT 501 and DPA 501.
Spring, 4 credits, ABCF grading

ANT 509 Seminar in European Ethnography
Investigation and discussion of selected topics and problems concerning European societies and cultures. The perspectives of culture history and current fieldwork are employed. This course is offered as both ANT 509 and DPA 509.
Fall, 3 credits, S/U grading
May be repeated for credit

ANT 510 Research Seminar in New World Archaeology
The seminar stresses problems in research methods, culture, history, technology, economy, ecology, and interpretation in the indigenous, pre-European New World. Depending upon the professor, either Mesoamerica or the Andean area is used as the organizing example. The comparative analysis of institutions within a developmental context is among the goals of the seminar. The seminar format requires full student participation, including the formal presentation of a research paper. This course is offered as both ANT 510 and DPA 510.
Prerequisite: Permission of instructor
Spring, odd years, 3 credits, ABCF grading
May be repeated for credit

ANT 511 Paleolithic Archaeology
A survey of the archaeological record of foraging peoples in Africa, Europe, and Asia prior to the emergence of agriculture. The course emphasizes particular problems including the relationship between behavioral and biological change, different adaptive strategies in temperate and tropical zones, the origins of modern humans, and the emergence of complex hunter-gatherer societies. This course is offered as both ANT 511 and DPA 511.
Prerequisite: Any other archaeology course
Fall, 4 credits, ABCF grading

ANT 512 Comparative Civilizations
A comparative study of the processes of sociocultural evolution from the beginnings of sedentary life to the achievement of early civilization in the Near East, Egypt, the Indus Valley, China, Mesoamerica, and the Andean area. The seminar covers such topics as urbanization, demography, irrigation, craft specialization, militarism, and trade and exchange. This course is offered as both ANT 512 and DPA 512.
Prerequisite: Graduate standing or permission of instructor
Spring, 3 credits, S/U grading

ANT 513 Comparative Civilizations
This course will trace the history of anthropological thought on the origins of agriculture and will assess the evidence from the Old and New worlds for this economic revolution. The course will not only explore areas where early agriculture is evidenced, but will also contrast these areas with those where agriculture was a later development. Emphasis will be on the environmental, technological, biological, social, and cultural processes associated with the "Neolithic Revolution." This course is offered as both ANT 513 and DPA 513.
Fall, 3 credits, ABCF grading

ANT 514 Research Seminar in Old World Archaeology
An in-depth analysis of selected major issues in the prehistoric archaeology of Africa, Europe and Asia. Emphasis is on recent developments, methodological innovations, and theoretical problems. Topics will focus on the Pleistocene and early Holocene epochs, and may include early hominid adaptations, the origins of agriculture. The specific topics will vary from year to year. This course is offered as both ANT 514 and DPA 514.
Spring, 3 credits, S/U grading
May be repeated for credit

ANT 515 Theory and Method in Archaeology
Theoretical and methodological approaches employed in archaeology. The goals of the course are to provide an historical perspective on the growth of theory and method in archaeology and to examine in detail some of the pertinent research topics being studied today. This course is offered as both ANT 515 and DPA 515.
Fall, 4 credits, ABCF grading

ANT 516 Research Seminar in Old World Archaeology
An in-depth analysis of some of the major research problems in the archaeology of literature and protoliterate societies in the Old World. Emphasis is on the various theoretical models currently in use to explain and understand the early civilizations of Africa, the Near East, Europe, and Asia. Topics will

include the rise of the state, political economy and imperialism in comparitive perspective. The specific topics will vary from year to year. This course is offered as both ANT 516 and DPA 516.
Fall, 3 credits, S/U grading
May be repeated for credit

ANT 517 Lithic Technology
An introduction to the identification, description, and analysis of lithic artifacts, or stone tools. The course surveys ethnographic, experimental, and archaeological approaches to understanding lithic artifacts. In laboratory sessions, students learn how to make and use stone tools, and how to employ several key archaeological approaches to the behavioral analysis of stone tools. This course is offered as both ANT 517 and DPA 517.
Fall, even years, 3 credits, ABCF grading

ANT 518 Topics in Archaeology
Lecture and discussion on selected archaeological topics and problems. Topics range from a detailed survey of the archaeological evidence for hunter-gatherers in the Old World, the origins of the state, and the archaeological evidence for the transition to the anatomically modern humans. This course is offered as both ANT 518 and DPA 518.
Fall and spring, 3 credits, ABCF grading
May be repeated for credit

ANT 519 Archaeozoology
An introduction to the study of animal bones from archaeological sites. Special emphasis is on identification of fragmented bone, identification of bone surface modification, calculation of indexes of abundance, and measurement and metrical analysis of mammal bone. Computer analysis is stressed, and the class seeks to synthesize traditional archaeo-zoology and actualistic studies. This course is offered as both ANT 519 and DPA 519.
Fall, odd years, 3 credits, ABCF grading

ANT 520 Principles of Social and Cultural Anthropology
Concepts and principles of social and cultural anthropology; historical background, structure and function, social processes, transactions, culture, communication, continuity, and other change; topics and problems of contemporary interest. Some ethnographic monographs are discussed in terms of their relevance to the general concepts and principles treated in the seminar. This course is offered as both ANT 520 and DPA 520.
Fall, 4 credits, ABCF grading

ANT 526 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.
Spring, 3 credits, ABCF grading

ANT 527 Field Methods and Techniques in Archaeology
The course will be held during the summer only. It consists of field and laboratory work on an aspect of Long Island's archaeological heritage. Students' time is divided between surveying and excavation in the field and artifact analysis in the laboratory. Such techniques as map and air photo reading, survey, instruments, stratigraphy, conservation, typology construction, etc. are taught. Students are exposed to the full range of excavation, survey, and laboratory methods and techniques. This course is offered as both ANT 527 and DPA 527.
Prerequisite: Graduate standing or permission of instructor
Summer, even years, 3-9 credits, ABCF grading

ANT 540 Readings in Ethnography and Ethnology
A survey of the more important and better documented cultures and societies of selected world ethnographic areas and the implications of data from these for current approaches and problems in ethnology. This course is offered as both ANT 540 and DPA 540.
Spring, 3 credits, ABCF grading
May be repeated for credit

ANT 550 Theory and Methodology in Primatology
Comprehensive overview of the theory and methodology used in the study of primate behavioral ecology. Includes ecological field methods, behavioral observations, analytical techniques, nonparametric statistics as well as planning, presenting, and reviewing research. Offered as both ANT 550 and DPA 550.
Fall, even years, 3 credits, ABCF grading

ANT 561 Peasant Societies and Cultures
The concept of peasantry is examined from political, religious, and social class viewpoints as well as from the more traditional economic view. These agricultural peoples, who are essentially preliterate and preindustrial, are described and analyzed especially in relation to the national societies of which they form a part. This course is offered as both ANT 561 and DPA 561.
Spring, 3 credits, ABCF grading

ANT 564 Primate Evolution
The taxonomic relationships and evolutionary history of primates as documented by their fossil record and structural and chemical evidence. Emphasis on primates prior to the origin of the human lineage. This course is offered as ANT 564, DPA 564 and HBA 564.
Spring, even years, 4 credits, ABCF grading

ANT 565 Human Evolution
A survey of the fossil record of hominid evolution through the Pliocene and Pleistocene with emphasis on the morphological structure and function of locomotor, masticatory, and neutral systems. Includes utilization of comparative anatomical material and extensive cast and slide collections. This course is offered as ANT 565, DPA 565 and HBA 565.
Fall, even years, 4 credits, ABCf grading

ANT 567 Primate Behavior and Ecology
A comparative approach to the behavior and ecology of living lemurs, monkeys, and apes. Emphasis is placed on sociobiological theory; life history strategies; morphological adaptations; comparisons of primate communities in Asia, Africa, Madagascar, and South America; and primate conservation. This course is offered as both ANT 567 and DPA 567.
Fall, odd years, 4 credits, ABCF grading

ANT 599 M.A. Thesis Research
Fall, spring, and summer, 0-6 credits, S/U grading
May be repeated for credit

ANT 602 Research Seminar in Anthropological Theory
This course is offered as both ANT 602 and DPA 602.
Fall and spring, 0-12 credits, S/U grading
May be repeated for credit

ANT 610 Individual Research
Research supervised by faculty. Students must have permission of instructor and enroll in appropriate section. This course is offered as both ANT 610 and DPA 610.
Fall and spring, 1-12 credits, S/U grading
May be repeated for credit

ANT 620 Research Seminar in Topical Problems
This course is offered as both ANT 620 and DPA 620.
Fall and spring, 3 credits, S/U grading
May be repeated for credit

ANT 630 Research Seminar in Physical Anthropology
This course is offered as both ANT 630 and DPA 630.
Fall and spring, 3 credits, S/U grading
May be repeated for credit

ANT 640 Research Seminar in Ethnography and Ethnology
This course is offered as both ANT 640 and DPA 640.
Fall and spring, 1-3 credits, S/U grading
May be repeated for credit

ANT 680 Special Seminar
Selected topics in cultural and social anthropology. Topics reflect current interests of faculty and graduate students. This course is offered as both ANT 680 and DPA 680.
Fall and spring, 1-3 credits, S/U grading

ANT 800 Summer Research
This course is offered as both ANT 800 and DPA 800.
0 credits,S/U grading
May be repeated for credit

Applied Mathematics and Statistics (AMS)

Chairperson: James Glimm, Mathematics Building P-137 (631) 632-8370
Graduate Program Director: Woo Jong Kim, Mathematics Building 1-122 (631) 632-8360
Graduate Secretary: Loretta Budd-O'Connell, 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 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 576 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 two graduate courses 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.

Sokal, Robert R.[1], Ph.D., 1952, University of Chicago: Numerical taxonomy; theory of systematics; geographic variation; spatial models in ecology and evolution.

Zemanian, Armen H., Eng.Sc.D., 1953, New York University: Network theory; food system modeling.

Distinguished Teaching Professors

Tanur, Judith[2], 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: Computational fluid dynamics; parallel computing.

Dicker, Daniel, *Emeritus.* D.Eng.Sc., 1961, Columbia University: Boundary value problems of solids and fluids; aeroelastic analysis of suspension bridges.

Dolezal, Vaclav, *Emeritus.* Ph.D., 1955, D.Sc., 1966, Czechoslovak Academy of Sciences, Prague, Czechoslovakia: Network theory; control theory; applications of distribution theory.

Dubey, Pradeep, Ph.D., 1975, Cornell University: Game theory; mathematical economics.

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.

Kim, Woo Jong, *Graduate Program Director.* Ph.D., 1964, Carnegie Institute of Technology; Ph.D., 1968, Carnegie-Mellon University: Ordinary differential equations; oscillation, disconjugacy, and monotonicity of solutions.

Lindquist, Brent, Ph.D., 1981, Cornell University: Computational fluid dynamics; reservoir modeling.

Mendell, Nancy, Ph.D., 1972, University of North Carolina at Chapel Hill: Biostatistics.

Mitchell, Joseph, Ph.D., 1986, Stanford University: Operations research; computational geometry; combinatorial optimization.

Peierls, Ronald, Ph.D., 1959, Cornell University: Parallel computing; particle physics.

Skorin-Kapov, Jadranka[3], Ph.D., 1988, University of British Columbia, Canada: Mathematical programming; production management.

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.

Badr, Hussein G., Ph.D., 1980, Pennsylvania State University: Operating systems; computer system performance evaluation.

Finch, Stephen, Ph.D., 1974, Princeton University: Robust estimation and nonparametric statistics.

Fortmann, Charles, Ph.D., 1985, Stanford University: Computational biophysics; photonics.

Li, Xiaolin, Ph.D., 1987, Columbia University: Computational fluid dynamics; numerical analysis.

Reinitz, John, Ph.D., 1988, Yale University: Theory of fundamental biological processes; bioinformatics; optimization.

Skiena, Steven, Ph.D., 1988, University of Illinois: Combinatorial algorithms; computational geometry; data structures.

Vakser, Ilya, Ph.D., 1989, Moscow State University, U.S.S.R.: Computational structural biology; bioinformatics; protein recognition algorithms.

Assistant Professors

Oh, Wonho, Ph.D., 1998, Stony Brook University: Computational fluid dynamics; scientific computing.

Ye, Kenny, Ph.D., 1998, University of Michigan, Ann Arbor: Applied statistics; experimental design; random effect models.

Yildirim, Emre, Alper, Ph.D., 2001, Cornell University: Optimization theory; algorithms.

Zhang, Yongmin, Ph.D., 1997, University of Chicago: Computational fluid dynamics; numerical analysis.

Zhu, Wei, Ph.D., 1996, University of California, Los Angeles: Biostatistics; optimal experimental design; linear models; structural equation modeling.

Research Professor

Yu, Dahai, Ph.D., 1998, University of Notre Dame: Computational fluid dynamics; computational solid mechanics.

Adjunct Faculty

Ferguson, David, *Professor.* Ph.D., 1980, University of California, Berkeley: Mathematics education; educational technology.

Sharp, David, *Professor.* Ph.D., 1969, California Institute of Technology: Mathematical physics; computational fluid dynamics.

Grove, John, *Associate Professor.* Ph.D., 1984, Ohio State University: Conservation laws; front tracking.

Silva, Claudio, *Assistant Professor.* Ph.D., 1996, Stony Brook University: Visualization; computer graphics; computational geometry.

Tangerman, Folkert, Ph.D., 1986, Boston University: Scientific computation; industrial mathematics.

Number of teaching, graduate, and research assistants, fall 2003: 66

1) Department of Ecology and Evolution

2) Department of Sociology

3) W. Averell Harriman School for Management and Policy

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 505 Applied Linear Algebra, or
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 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 500 Mathematical Modeling

The course consists of about eight generally unrelated case studies. Problems selected for both the physical and social sciences are employed to illustrate the process of model formulation and solution. Mathematical ideas and techniques are developed as needed to deal with the problems being studied. Realistic data and situations are employed whenever possible.
Fall, 3 credits, ABCF grading

AMS 501 Differential Equations and Boundary Value Problems I

Examples of initial and boundary value problems in which differential equations arise. Existence of solutions, systems of linear differential equations, and the fundamental solution matrix. Reduction to canonical forms and the matrix exponential. Sturm-Louisville theory and eigenfunction expansion. Green's functions.
Prerequisite: AMS 505
Recommended prerequisite: AMS 504
Spring, 3 credits, ABCF grading

AMS 502 Differential Equations and Boundary Value Problems II

The initial and boundary value problems for the wave, the heat, and Laplace's equation illustrated by a number of examples in heat conduction, vibrations, and aerodynamics. Transform techniques, separation of variables, conformal mapping, and approximation.
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, convergence, continuity, compactness, and normed and Hilbert spaces. Included is an introduction to measure theory and integration.
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.
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

Sample spaces, conditional probability and independence, random variables and functions of random variables; binomial, Poisson, normal, and other special distributions; moment-generating functions; law of large numbers and central limit theorem; Markov chains. Applications to statistics. Note: Crosslisted with AMS 507
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.
Prerequisite: A course in linear algebra and in multivariate calculus
Fall, 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 521 Mathematical Models in Physiological Sciences

Mathematical models of blood flow and renal function. Numerical solution of the countercurrent exchange models by utilizing information about the physiological structures in the solution process. Use of compartmental analysis, sparse matrix techniques, and generalized inverses.
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 practice and understanding of algorithmic concepts of parallel computing is emphasized.

Prerequisite: Prior experience with networked workstations and languages such as C or Fortran
Spring, 3 credits, ABCF grading

AMS 531 Generalized Inverses and Sparse Matrices
Moore-Penrose and various other types of generalized inverses; efficient methods for their computation. Condition numbers and scaling. Factored forms of inverses of large sparse matrices and their relationship to elimination and orthogonalization methods. Sparse matrices and graph theory. Applications to applied problems in linear programming.
3 credits, ABCF grading

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 MGT 540 and AMS 540.
Prerequisite: Linear algebra course
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.
Prerequisite for CSE 548: CSE 373
Recommended prerequisite for AMS 542: AMS 506
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 MGT 544 and AMS 544.
Prerequisite: AMS 540 or MGT 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.
Prerequisite for CSE 555: CSE 373 or CSE 548
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 MGT 546 and AMS 546.
Prerequisite: AMS 540 or permission of instructor
Spring, even years, 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.
Prerequisite for CSE 547: AMS 301
Spring, 3 credits, ABCF grading

AMS 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 MGT 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 Banzhaff 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 the Graduate Director
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 MGT 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 MGT 554 and AMS 554.
Prerequisite: AMS 507
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.
Prerequisite for AMS 555: AMS 552/ECO 604
Prerequisites for ECO 605: ECO 604 and graduate standing in the Economics Department or permission of the Graduate Director
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 maintenance, inspection, and replacement problems. This course is offered as both MGT 556 and AMS 556.
Prerequisite: MGT/AMS 550 or 558
3 credits, ABCF grading

AMS 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 MGT 558 and AMS 558.
Prerequisites: AMS 504; AMS 507 or equivalent
Spring, 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.
Prerequisite: AMS 526 or permission of instructor
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 MGT 569.
Prerequisite: AMS 504 or equivalent
3 credits, ABCF grading

AMS 570 Mathematical Statistics I: Estimation
Sampling distribution of means and variances; introduction to moment calculations and order statistics. Theory of maximum likelihood estimates, Pitman estimates, and sufficient statistics. Parametric confidence intervals and fiducial intervals. Cramer-Rao bounds. Fisher's information matrix, other bounds on variance of estimators.
Prerequisite: AMS 312 or equivalent
3 credits, ABCF grading

AMS 571 Mathematical Statistics II: Hypothesis Testing
Decision problems, Neyman-Pearson lemma, likelihood ratio tests, uniformly most powerful tests, unbiased tests, invariant tests, sequential tests, and nonparametric tests. Introduction to tests on contingency tables and multivariate data. Bayesian approaches and introduction to current research problems.
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).
Prerequisite: AMS 312 or permission of instructor
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.
Prerequisite: AMS 572
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 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.
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 fibers. 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.
Prerequisites: AMS 312 and AMS 572 or equivalents
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 quantal bioassays, two-stage assays, routine bioassays. Quality control for medical studies.
Prerequisite: AMS 572 or permission of instructor
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, epistatis, 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.
Prerequisite: AMS 310 or permission of instructor
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.
Prerequisite: AMS 592
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.
Prerequisite: AMS 595 or permission of instructor
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
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.
Prerequisite: AMS 605 or AMS 569
Spring, 3 credits, ABCF grading

AMS 615 Advanced Stochastic Processes
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 Numerical Solutions of Partial Differential Equations
Variational form of the problem, Ritz Galerkins, 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.
Prerequisite: Permission of instructor
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 550 and permission of instructor
Fall, 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 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: James H. Rubin, Staller Center 2221 (631) 632-7270
Graduate Program Director: Barbara E. Frank, Staller Center 4219 (631) 632-7270
MFA Program Director: Howardena Pindell, Staller Center 4211 (631) 632-7270
Graduate Secretary: Mary Ann Scriven, 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 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.

Ideally located halfway between the art centers of New York City and the Hamptons, Stony Brook offers an exceptional opportunity to study in a serene and spacious setting while maintaining close contact with the pulse of the art world. Our emphasis on modern and contemporary art encourages students to take advantage of the full range of exhibitions, performances, screenings, and lectures in New York City. 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. In addition, the Pollock-Krasner House and Study Center in East Hampton, Long Island, is administered under the auspices of the Stony Brook Foundation, and is an important resource for research, lectures, and other activities.

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, which include numerous studio facilities, classrooms for lectures and seminars, a visual resources facility, and 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. The Graduate Library Gallery provides exhibition space for M.F.A. students, and there are several other locations on campus where students have opportunities to exhibit their work. Studio facilities include digital video, sound and animation production studios, a large multimedia classroom and public lab, digital and traditional print facilities, black and white and color darkrooms, wood and metal shops, a ceramics studio, and a foundry. 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. 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 a forum for lectures, seminars, and other activities.

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.

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 information 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.

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 material 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.

Mirzoeff, Nicholas, Ph.D., 1990, Warwick University: Modern art and visual culture; history of photography.

Moskowitz, Anita, Ph.D., 1978, New York University: Medieval and Renaissance art and connoisseurship.

Pekarsky, Melvin H., M.A., 1956, Northwestern University: Drawing; painting; public art.

Pindell, Howardena, M.F.A., 1967, Yale University: Painting and drawing.

Rubin, James H., *Chairperson*. Ph.D., 1972, Harvard University: 18th- and 19th-century art; art and politics.

Associate Professors

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, Oceanic, Native American, and ancient Mesoamerican art history.

Katz, Jonathan, Ph.D., 1995, Northwestern University: 20th-century art; issues of gender and sexuality in art

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 Kunste Berlin, Germany: Sculpture.

Assistant Professors

Dinkins, Stephanie, M.F.A., 1997, Maryland Institute College of Art: new media, photography.

Gerbracht, Grady, SMVisS (Master's of Science in Visual Studies), 1999, Massachusetts Institute of Technology: Visual and conceptual design; photography; digital media.

Monteyne, Joseph, Ph.D., 2000, University of British Columbia, Canada: Baroque art history and criticism.

Adjunct Faculty

Cassidy, James, *Technical Specialist and Lecturer.* M.A., 1986, Adelphi University: Photography.

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 Resource Curator; painting and drawing.

Mafucci, John, *Technical Specialist and Lecturer.* B.A., 1998, Stony Brook University: Sculpture.

Part-Time Faculty

Goodarzi, Shoki, *Adjunct Lecturer.* Ph.D., 1999, University of California, Berkeley: Ancient Near Eastern art.

Leslie, Richard, *Adjunct Lecturer.* M.A. 1995, Stony Brook University: 20th century, northern Baroque, and history of photography.

Nash, Stephen, M.A., 1982, *Associate Professor.* Royal College of Art, London, England: Anatomical and biological illustration.

Oberst, William, M.F.A., 1997, Stony Brook University: Painting and drawing.

Semergieff, Christopher, *Visiting Artist,* M.F.A., 1979, CUNY.

Weil, Marianne, *Adjunct Lecturer.* M.F.A., 1986, School of Visual Arts: Sculpture and design.

Number of teaching, graduate, and research assistants, fall 2003: 18

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. One of these must be in philosophy; others might be on relevant aspects of literary studies or criticism, history, musicology, sociology, anthropology, etc.

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 demonstrate 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. This course may be counted toward either items 2 or 3 below, but not both. May be repeated once.

2. At least six graduate studio courses in an area(s) of concentration (18 credits).

3. Three additional graduate studio courses (9 credits).

4. Two semesters of ARS 580 Visual Arts Seminar (6 credits). Additional visual arts seminars are encouraged.

5. Three or four courses in graduate liberal arts, e.g., art history, languages, literature, philosophy, etc. (9 to 12 credits).

6. ARS 531 Graduate Teaching Practicum (see item E, above) (3 to 6 credits).

7. 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)

One of these must in philosophy; others might be on relevant aspects of history, comparative studies, musicology, sociology, anthropology, etc.

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.

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
Fall or 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
Fall or 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
Fall or 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 worlk 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
Fall or 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
Fall or 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
Fall or 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 per-

mission from the department to enroll
Fall or 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
Fall or 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 for credit up to six credits

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.
Prerequisite: Graduate standing in Art History and Criticism
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 for credit up to six credits

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, S/U 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 for credit up to six credits

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 PhD. 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: Accepted candidate for M.F.A. or permission of department
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: Accepted candidate for M.F.A.; enrollment in M.F.A. program or permission of instructor
Fall, spring, and summer, 1-3 credits, S/U grading
May be repeated once 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 for credit up to six credits

ARS 532 Thesis Project
Preparation of thesis under the program advisor.
Prerequisites: Accepted candidate for M.F.A., review board passed; 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 once 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.
Prerequisites: Demonstration of appropriate level of proficiency, permission of instructor; enrollment in M.F.A. program
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.
Prerequisites: Permission of instructor; accepted candidate for M.F.A. or permission of department
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.
Prerequisites: Permission of instructor; accepted candidate for M.F.A. or permission of department
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 handbuilding: coil, slab, pinch; wheelthrowing; casting, inclusive of multipiece plaster pour-molds; various firing techniques: reduction, oxidation, raku, and high- and low-fire glaze techniques.
Prerequisites: Permission of instructor; accepted candidate for M.F.A. or permission of department
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.
Prerequisites: Permission of instructor; accepted candidate for M.F.A. or permission of department
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: Steven O. Smith, Centers for Molecular Medicine (631) 632-1210
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.

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

Professors

Gergen, J. Peter[1], Ph.D., 1982, Brandeis University: Transcriptional regulation in development; structure and function of Runt domain proteins.

Grollman, Arthur[2], M.D., 1959, Johns Hopkins University: Mechanisms of chemical mutagenesis/carcinogenesis.

Lennarz, William J.[1], Ph.D., 1959, University of Illinois: Biosynthesis and function of glycoproteins in cell-cell interactions.

London, Erwin[1], Ph.D., 1979, Cornell University: Membrane protein structure/translocation/folding; structure and function of sphingolipid/cholesterol rafts in membranes.

McLaughlin, Stuart[3], Ph.D., 1968, British Columbia: Calcium/phospholipid second messenger system.

Raleigh, Daniel P.[4], Ph.D., 1988, Massachusetts Institute of Technology: Experimental studies of protein folding and amyloid formation.

Sampson, Nicole[4], Ph.D., 1990, University of California, Berkeley: Protein structure-function; mammalian fertilization.

Simon, Sanford R.[1], Ph.D., 1967, Rockefeller University: Extracellular matrix degradation by inflammatory and tumor cell proteases.

Smith, Steven O.[1], Ph.D., 1985, University of California, Berkeley: Structure and function of membrane proteins.

Sternglanz, Rolf[1], Ph.D., 1967, Harvard University: Chromatin structure and function; histone modifying enzymes; gene expression.

Associate Professors

Brown, Deborah[1], Ph.D., 1987, Stanford University: Structure and function of caveolae and cholesterol/sphingolipid-rich membrane domains.

Citovsky, Vitaly[1], Ph.D., 1987, Hebrew University, Jerusalem: Nuclear targeting and intercellular communication in plants.

Dean, Neta[1], Ph.D., 1988, UCLA: Protein glycosylation; fungal cell wall biosynthesis; fungal pathogenesis.

Deutsch, Dale[1], Ph.D., 1972, Purdue University: Molecular neurobiology of anandamide (the endogenous marijuana) regulation.

Haltiwanger, Robert[1], Ph.D., 1986, Duke University: Role of protein glycosylation in signal transduction; notch signaling.

Holdener, Bernadette[1], Ph.D., 1990, University of Illinois: The role of protein folding in WNT signal transduction and development.

Kisker, Caroline[4], Ph.D., 1994, Free University Berlin, Germany: Structural and functional studies on DNA repair enzymes; DNA polymerases and structure-based drug design.

Miller, W. Todd[3], Ph.D., 1989, Rockefeller University: Tyrosine phosphorylation and signal transduction.

Scarlata, Suzanne[2], Ph.D., 1984, University of Illinois: Structure/oligomerization of membrane proteins.

Thomsen, Gerald H.[1], Ph.D., 1988, Rockefeller University: Regulation of early ver-

tebrate development by growth factor signals; ubiquitin modification; T box family transcription factors.

Schindelin, Hermann[1], Ph.D., 1994, Free University Berlin, Germany: Structure and function of proteins involved in ubiquitin-dependent protein degradation and neuroreceptor anchoring.

Tonge, Peter J.[4], Ph.D., 1986, University of Birmingham, England: Tuberculosis pathogenesis and drug discovery; enzyme mechanisms and rational inhibitor desing; fluorescent proteins.

Vakser, Ilya, Ph.D., 1989, Moscow State: Modeling of protein interactions in structural genomics.

Assistant Professors

de los Santos, Carlos[2], Ph.D., 1987, Buenos Aires, Argentina: Solution structures of damaged DNA; structural basis of chemical mutagenesis, lesion recognition, and DNA repair.

Hsieh, Jen-Chih[1], Ph.D., Duke University, 1994. Wnt signaling in embryo development and carcinogenesis.

Karzai, Wali[1], Ph.D., Johns Hopkins University, 1995. Structure-function studies of RNA-protein interactions.

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.

Scientists

Fu, Dax[5], 1996, Mayo Graduate School of Medicine: X-ray crystallography of membrane protein transporters and channels.

Li, Huilin[5], Ph.D., 1994, University of Sciences and Technology, Beijing, China: Structural biology of macromolecular assemblies and membrane proteins by cryo-electron microscopy.

Shanklin, John[5], Ph.D., 1988, University of Wisconsin-Madison: Structure-function relationships of lipid modification enzymes.

Number of teaching, graduate, and research assistantships, fall 2003: 20

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

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. Introduction to Structural Biology (BSB 512) or 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 semester 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 a half-semester in the laboratory of each of four 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 a half-semester in the laboratory of each of four 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 512 Introduction to Structural Biology
Theoretical principles and experimental methods used in the study of proteins and nucleic acids. Lectures and laboratory demonstrations will cover optical spectroscopy, NMR spectroscopy and x-ray diffraction.
Spring, 2 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.
Prerequisites: Undergraduate biochemistry, matriculation in graduate program, or permission of instructor
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.
Prerequisites: Must be registered in the BSB program
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.
Prerequisites: Must be registered in the BSB program
Spring, 1 credit, ABCF grading
May be repeated for credit

BSB 580 Advanced Structural Biology
Advanced topics in NMR spectroscopy and structural biology.
Prerequisites: BSB/MCB 512
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.
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.
Prerequisites: Must be registered in the BSB program
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.
Prerequisites: Must be registered in the BSB program
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

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.
Prerequisite: Must be registered in the BSB program
Fall and spring, 1 credit, S/U grading

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: Partap Khalsa, Health Sciences Center T18-030 (631) 444-2457
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, 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 a graduate degree (M.S. or Ph.D.) program or into the Biomedical Engineering Certificate Program. They may also complete the Biomedical Engineering certificate curriculum as a complement to graduate degree studies in another field.

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

Berndt, Christopher, Ph.D., 1980, Monash University: Modification of material surface properties through thermal spray coating; orthopaedic biomaterials.

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.

Djuric, Peter, Ph.D., 1990, University of Rhode Island: Acoustic signal processing.

Ferguson, David, Ph.D., 1980, University of California, Berkeley: Technological change and societal implications.

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-fine 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.

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.

Schlissel, Edward, M.S., D.D.S., 1973, University at Buffalo: Relationship between restorative materials and clinical techniques.

Springer, Charles, Ph.D., 1967, Ohio State University: Biophysical chemistry; hyperfine shift nuclear magneticresonance studies.

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.

Taichman, Lorne, M.D., Ph.D., 1971, University of Wisconsin: Cutaneous gene therapy.

Associate Professors

Bluestein, Daniel, Ph.D., 1992, Tel Aviv University, Israel: Dynamics of fluidflow 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.

Eisenberg, Moises, Ph.D., 1972, California Institute of Technology: Computer-assisted molecular modeling, bioinformatics.

Gindi, Gene, Ph.D., 1982, University of Arizona: Algorithm development for medical imaging.

Hadjiargyrou, Michael, Ph.D., 1992, City University of New York: Effects of biophysical stimuli on gene expression in skeletal tissue.

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.

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.

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.

Benveniste, Helene, M.D., Ph.D., 1991, University of Copenhagen, Denmark: Phenotyping of transgenic mice model of human disease using magnetic resonance imaging.

Chen, Weiliam, 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.

Frame, Molly, Ph.D., 1990, University of Missouri: Microvascular flow control at the fluid dynamic and molecular levels.

Gaudette, Glenn, Ph.D., 2002, Stony Brook University: Using high spatial resolution in investigating the effects of regional ischemia on heart function.

Goldstein, Rita, Ph.D., 1999, University of Miami: Multidisciplinary approach to measure brain function such as functional (fMRI), (PET), (ERP) recordings, and neuropsychology.

Huang, Wei, Ph.D., 1994, Stony Brook University: Biomedical research using magnetic resonance spectroscopy and magnetic resonance imaging.

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.

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.

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.

Ye, Kenny Q., Ph.D., 1998, University of Michigan: Development of efficient designs and data analysis methods for microarray data.

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

Ernst, Thomas, Ph.D., 1990, University of Freiburg, Germany: Development and application of advanced magnetic resonance imaging (MRI) and spectroscopic (MRS) techniques to study normal and abnormal brain function, metabolism, and physiology.

Gatley, John, Ph.D., 1975, University of Newcastle-upon-Tyme, 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.

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).

Volkow, Nora, *Director of Nuclear Medicine, Brookhaven National Laboratory.* M.D., 1981, National University of Mexico, UNAM: Positron emission tomography; substance abuse; aging.

Degree Requirements

Requirements for the M.S. Degree

A minimum of 30 graduate credits are required to earn the Master of Science or Master of Engineering Degrees in BME. 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 Biology; BME 502 Engineering Principles in Tissue, Organ Systems; BME 505 Seminar Series in BME I; BME 506 Seminar Series in BME II; BME 520 Laboratory Rotation I; BME 521 Laboratory Rotation II. A given track/specialization will have additional requirements.

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 30 credits. In the thesis option, the student must complete at least six credits of thesis research and submit and defend a written thesis. A grade point average of B or better must be attained in each of the core BME courses taken, and a grade point average of 3.0 out of 4.0 must be maintained overall. 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). 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.

Requirements for the Ph.D. Degree

A. Completion of the M.S. degree in Biomedical Engineering or equivalent graduate program

B. Satisfactory completion of a written qualifying exam

C. Plan of Study

Student matriculating in to 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. All requirements for the Ph.D. must be completed within seven years after completing 24 credits of 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 (e.g., BME 303), and present a seminar that covers the state-of-the-art in the student's 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 Biology

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

BME 502 Engineering Principles in Tissue, Organ Systems

Course content is directed toward describing the macroscopic physical interactions within tissues as an extension of the engineering concept learned in BME 501, i.e., the consequence of self-organized aggregates of cells and matrix macromolecules functioning as non-equilibrium systems. Fuzzy logic theory, neural network theory, and genetic algorithms will be developed to provide insight into physiologic behavior ranging from homeostasis to cognition, while providing a fundamental overview of tissue structure and function and organ physiology.
Spring, 3 credits, ABCF grading

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, 506 Principles and Practice of BME

The goal of this course is to expose student to the cutting edge of biomedical engineering, including the clinical challenges which 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 opening 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 towards determining how they can make contributions to health and society. Fall and Spring semester. Required course for BME MS and PhD students. One credit per semester.
Fall, 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 once for credit

BME 509 Fundamentals of the Bioscience Industry

A 4-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 once 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 man-made) 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.
Prerequisites: Modern Physics or equivalent
Fall, 3 credits, ABCF grading

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

BME 519 Medical Health Physics

This course discusses the health physics and safety issues associated with radiological devices, facilities and procedures.
Prerequisite: BME 517
Spring, 3 credits, ABCF grading
May be repeated once 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 once 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 once 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 once 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.
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 once for credit

BME 540 Radiation Oncology Physics
This course provides a background in therapeutic instrumentation, dosimetry and treatment planning.
Prerequisite: BME 517
Fall, 3 credits, ABCF grading
May be repeated once for credit

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 once for credit

BME 599 Biomedical Engineering Research
Master's Thesis Research to be supervised by a faculty member of the Program in Biomedical Engineering. Students must have permission of instructor and enroll in appropriate section. Faculty to be identified by the student.
Fall and spring, 1-9 credits, ABCF 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 transformation. 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 computed 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 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.
0 credits, S/U grading
May be repeated

Business Administration (BUS)

Dean: William Turner, Harriman Hall 317 (631) 632-7491
Graduate Program Director: Jeff Casey, 102 W. Averell Harriman School for Management and Policy (631) 632-7171

Degrees awarded: M.B.A. in Technology Management, Executive M.B.A. in Technology Management
Other management degrees awarded: M.S. in Management and Policy, M.S. in Technology Management, Advanced Graduate Certificate in Health Care Management, Advanced Graduate Certificate in Information Systems Management, Advanced Graduate Certificate in Human Resources Management

Stony Brook will shortly launch a new graduate degree program, the Master of Business Administration in Technology Management. The program will include a solid coverage of the basic fields of business administration found in accredited M.B.A. programs and a distinctive, relevant, and exciting education in the field of Technology Management. Initially the program will be offered by the College of Engineering and Applied Sciences. The University plans to create a new College of Business that will eventually house the M.B.A. and other business management programs (see W. Averell Harriman School for Management and Policy). Check the following Web site for up-to-date information on the M.B.A. program: *www.ceas.sunysb.edu/mba-tm/.*

The program has been designed to help technical specialists develop expertise in the organizational and business context of technology, and to enable people without a technical background to develop the ability to apply general business skills and knowledge effectively within a technical domain. The program design differs from a traditional M.B.A. by focusing on educating managers to provide leadership in a global market that demands better understanding of the critical role of technology in maintaining a competitive advantage. The emergence of technology as the source of sustainable competitive economic advantage in today's world not only offers unique opportunities, but also poses significant challenges. Perhaps the most significant challenge facing high-technology companies is their ability to successfully achieve and manage the continued growth of their core technology competencies and product lines. Meeting this challenge requires managers with a novel combination of strong technical skills and management knowledge and understanding. The proposed program is structured to promote an interdisciplinary environment that emphasizes partnership between the industry and academia and provides integrated education in business management and technology.

Stony Brook's strengths in technical fields such as computer science, information systems, materials and manufacturing, bioengineering, molecular biology, and many others—and its track record as a seed-bed for successful technological entrepreneurship—adds real-world technological substance to the study of Business and Technology Management. These academic and practical resources provide students with a competitive advantage that cannot be matched by traditional programs lacking rich connections with strong colleges of engineering, medicine or science, and high technology companies. Stony Brook's excellence in technology provides a foundation for an outstanding interdisciplinary business curriculum in the management of technology.

Career Opportunities

Management of technology presents challenging career opportunities in virtually every field of business and employment. The emergence of "technology management" as a career option has been heralded by the prevalence of new executive-occupational titles such as "Chief Technology Officer" and the frequent calls by industry managers for graduates who know how to combine technical expertise with real-world business knowledge. Employment opportunities for business graduates with a specialization in management of technology include managers of e-commerce, project managers in high-technology firms, managers of R&D divisions of established industrial corporations, product-development team leaders, marketing and sales professionals for technology firms, analysts for technology-management consulting firms, technology-training and human-resource management leaders, manufacturing managers, regulatory-affairs staff in technology companies, intellectual-property lawyers, patent attorneys, technology transfer directors, or design engineers involved with managerial issues.

Rewarding career opportunities in management of technology also exist in traditional industries other than the high-tech sector. For example: managers in the banking, insurance, or real estate industries responsible for implementing and evaluating new information technology systems; managers in the retailing sector, where automated point-of-sale transactions, automated ware-housing, automated purchasing, and computerized market planning are now a normal part of the business; or, managers in health-care organizations faced with increasingly complex decisions about investment in advanced medical technology.

Understanding the management of technology is as important for professionals in public administration (e.g., in regulatory affairs associated with telecommunications, medical devices, or biotechnology) as it is for those with a career in finance and investment (e.g., evaluating technology stocks, evaluating investment proposals for technology ventures, developing strategic plans for technology subsidiaries). For technologists contemplating entrepreneurship as a career, a rich education in management of technology may make the difference between success and failure in turning a business from a start-up to an enduring enterprise.

Basic Objectives

The program has been designed to promote education, training, research, and service to:

A. Assist graduates to achieve better technology-related careers (as either general managers or as technologists).

B. Assist managers to more effectively manage technology-based business activity.

C. Assist leaders in government and industry organizations with policy making for technology-related industry.

D. Improve our understanding of the nature of technology and technology-related business.

Success in a global economy is intimately tied to understanding how continuing growth and management of core technology competencies may be achieved. Taking up this challenge requires managers whose education includes understanding the following:

A. The role of technology in creating a competitive advantage

B. The interdisciplinary nature of the technological innovation

C. The synergy between science, technology, and business

D. Global business dynamics

E. A broad scope of knowledge across functional areas

F. The importance of communication in motivating people

G. The importance of communication skills to effect positive change across all levels of an organization

H. The role of thinking and acting locally and strategically

I. The importance of a commitment to continuous learning for themselves and their employees' competitiveness.

The program aims to help graduates meet the challenge of working in a highly competitive global technological environment by providing an integrated education in management and technology incorporating the above educational dimensions.

Basic Structure

The program has two distinct tracks geared to two different student populations. The Regular Program (BTM), which is designed for normal students, may be taken in either the full-time or part-time mode and will require 60 credits to complete. The Executive Program (BEX) is designed for full-time employees whose work experience has already introduced them to certain basics of business and who are also sponsored by their employers (the Executive Program requires only 48 credits to complete). The core program will consist of courses in the areas of managerial finance, marketing, operations management, global economics, human behavior, decision analysis, technology development and implementation, and ethics. Students can specialize in the areas of Information Systems Management, Manufacturing Management, and Technology Entrepreneurship by choosing appropriate electives. They will be expected to solve real world problems by applying and integrating their newly acquired skills. Full-time students will work in regional companies as interns whereas the students in the executive program, mostly sponsored by their companies, will develop projects related to their key business objectives.

The program meets the AACSB (International Association of Collegiate Schools of Business) mandatory requirements of a minimum of 18 semester hours in the core areas: (1) financial reporting, analysis, and markets, (2) domestic and global economic environments, (3) creation and distribution of goods and services, and (4) human behavior in organizations. It also satisfies the 12 semester-hour requirements in the areas of specialization and 12 other credits in the non-specialization areas.

M.B.A. in Technology Management (BTM)

The regular program has 39 credits of mandatory core courses, which include the six credits of industrial projects (BTM 521 and 522). A minimum of 21 credits of electives are required of all students out of which 12 credits must be taken in an area of specialization. The typical sequence of courses is as follows:

First Year Fall Semester

BTM 501 Management Economics in a Global Environment (3)

BTM 503 Data Analysis and Decision-Making in the Information Age (3)

BTM 504 Management Accounting (3)

BTM 511 Technological Innovations, Development, and Implementation (3)

BTM 506 Leadership, Team Effectiveness, and Practical Communications (1.5)

BTM 507 Ethics in Management; Law and Intellectual Property (1.5)

First Year Spring Semester

BTM 505 Marketing Management of Technology-Based Products and Services (3)

BTM 502 Financial Management for Technology Managers (3)

MGT 589 Operations Management (3) Elective (3)

BTM 506 Leadership, Team Effectiveness, and Practical Communications (1.5)

BTM 507 Ethics in Management; Law and Intellectual Property (1.5)

Summer Internship/Initiation of Industrial Project

Second Year Fall Semester

MGT 592 Organizational Behavior (3)
BTM 512 Business Planning and Strategic Management (3)
Elective (3)
Elective (3)
BTM 521 Industrial Project I (3)

Second Year Spring Semester

Elective (3)
Elective (3)
Elective (3)
Elective (3)
BTM 522 Industrial Project II (3)

A minimum of 12 credits of elective courses must be taken from the following list to meet the specialization requirements of one of the three fields. Elective courses and their sequence must be approved by the academic advisor. Some of the courses listed below may have special prerequisites or may need special permission from the instructor.

Information Systems Management:

BTM 541 Information Systems for Management

BTM 542 Using Information Technology to Achieve Customer Integration

BTM 543 Management of Information Systems I

BTM 544 Management of Information Systems II

BTM 545 Information Technology: Application Development

BTM 546 Networking Concepts and Practices

BTM 547 Electronic Commerce

BTM 548 Information Systems and Law

BTM 549 Current Developments in Information Technology and Future Trends

BTM 551 Managing Data: Principles and Applications

BTM 552 Software Engineering Management

Manufacturing Management:

BTM 514 Quality Management and Quality Assurance

BTM 561 Design, Manufacturing, and Marketing

BTM 562 Management of Manufacturing Systems

BTM 563 Information Systems for Manufacturing

BTM 564 Manufacturing Policy and Strategy

MEC 580 Manufacturing Processes

MEC 583 Computer-Integrated Manufacturing

MEC 590 Knowledge-Based Design and Manufacturing

AMS 550 Operations Research: Stochastic Models

MGT 567 Expert Systems in Manufacturing

Technology Entrepreneurship:

BTM 514 Quality Management and Quality Assurance

BTM 547 Electronic Commerce

BTM 571 Entrepreneurship: Starting the High-Tech Venture

BTM 572 Building a High-Performance Organization

BTM 573 Virtual Corporations

BTM 574 Creating a Learning Organization

BTM 575 Managing Mergers and Acquisitions of Technology-Based Companies

BTM 576 Stories of Successful High-Tech Ventures

BTM 581 International Business

The course designators represent appropriate departments or divisions of the University–BTM: business administration, AMS: applied mathematics and statistics, CSE: computer science, ECO: economics, ESE: electrical engineering, EST: technology and society, MEC: mechanical engineering, MGT: management, and SOC: sociology. Courses other than those listed above may be taken for the specialization requirement with special permission from the advisor and the graduate committee.

The program will provide students with special opportunities to broaden their backgrounds in various aspects of business and technology management by appropriately selecting their electives and substitutes for waived credits. For example, students with a baccalaureate degree in technology-related disciplines can take more courses in business and management while students who have majored in arts, natural sciences, or business can select more courses in management of technology. The program also allows the possibility of taking higher-level courses in communications, international business, and cultural issues.

Executive M.B.A. in Technology Management (BEX)

The Executive M.B.A. has been designed especially for full-time employees with several years of working experience. It has been designed primarily for the specialization in information systems management because of the nature of Long Island companies and the need expressed by our industrial affiliates. Other specializations may be developed in response to demand.

First Year Fall Semester

BEX 501 Management Economics in Global Environment (3)

BEX 503 Data Analysis and Decision-Making in Information Age (3)

BEX 504 Management Accounting (3)

BEX 523 Industrial Project for Executives I (0)

First Year Spring Semester

BEX 502 Financial Management for Technology Managers (3)

BEX 505 Marketing Management of Technology-Based Products and Services (3)

MGT 589 Operations Management (3)

BEX 523 Industrial Project for Executives I (1.5)

Summer Program

BEX 511 Technological Innovations, Development, and Implementation (3)

BEX 541 Information Systems for Management (3)

MGT 592 Organizational Behavior (3)

Second Year Fall Semester

BEX 543 Management of Information Systems I (3)

BEX 547 Networking Concepts and Practices (3), or, BEX 546 Electronic Commerce (3)

BEX 507 Ethics in Management; Law and Intellectual Property (3)

BEX 524 Industrial Project for Executives II (0)

Second Year Spring Semester

BEX 512 Business Planning and Strategic Management (3)

BEX 544 Management of Information Systems II (3), or, BEX 549 Current Developments in Information Technology and Future Trends (3)

BEX 514 Quality Management and Quality Assurance (3)

BEX 524 Industrial Project for Executives II (1.5)

A typical sequence of courses is described above. Other configurations, perhaps spread over three years rather than two, may be customized in response to demand. Companies or other organizations wishing to sponsor employees to take the Executive M.B.A. in Technology Management should contact the graduate program director. The Executive Program will have a lock-step structure with 48 credits, offered during the evening and weekend of every alternate week and a special summer program.

Executive M.S. in Technology Management (TMP)

An Executive Master of Science in Technology Management degree program may also be available. Like the Executive M.B.A. in Technology Management, it is designed for full-time employees with several years of work experience, and requires students to move through the program as a cohort, with courses arranged in a lock-step fashion. It requires 35 credits to be completed over two years, with an

evening or evening/weekend schedule. The Executive M.S. in Technology Management concentrates on the management of information systems, information technology, and telecommunications. For details, contact the graduate program director.

Admission

Regular Program

The admission of full-time students will be based on the following criteria:

A. A baccalaureate degree from an accredited program

B. A GMAT score

C. A TOEFL score (for international students)

D. Letters of recommendation

E. Work experience

F. Other requirements as specified by the Graduate School.

Executive Programs

The admission to executive programs will be based on the following criteria:

A. A baccalaureate degree from an accredited program

B. A minimum of five years of relevant work experience

C. Relevant work experience, responsibilities/duties, and career goals

D. Letters of recommendation from current and previous employers and teachers.

Preference will be given to students who have already taken the GMAT and have scored well. Undergraduate coursework and/or work experience must demonstrate proficiency in economics, mathematical modeling, statistics, and the use of a computer.

For admission to the M.B.A. in Technology Management program, all applicants will be required to submit completed applications with the following documents: (1) an official graduate application form specially designed for applicants to the proposed program with nonrefundable application fee as prescribed by the University, (2) three letters of recommendation, (3) two official copies of all previous transcripts (if in a foreign language, English translation will be required together with the originals), (4) details of the employment history and duties/responsibilities, (5) GMAT scores, (6) TOEFL scores in the case of international students, and (7) a personal statement describing the previous accomplishments, career objectives, and future goals.

All applications submitted in time will be reviewed by the graduate committee and applicants who meet the requirements will be selected on a competitive basis. Applications will be scored on a scale reflecting academic achievements, GMAT scores, work experience, leadership and managerial qualities, and career goals. Preference will be given to the applicants with relevant experience and/or industrial commitments for paid internships. Special considerations will be made for women, minorities, and physically challenged applicants provided they meet the admission criteria.

Applicants for the Executive Program will be 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 applicant's participation in the Executive Program will benefit the company.

Degree Requirements

To receive the M.B.A. in Technology Management, 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 as mentioned in this *Bulletin.* Following are the other requirements that must be met by the full-time and Executive Program students to obtain their degrees:

Regular Program

A. A minimum of 60 credits of graduate course work.

B. Each student must complete 39 credits of core courses. In case of core courses waived for equivalent courses taken previously, the student must earn those credits through electives, bringing the total credits to 60.

C. Each student must select an area of specialization from the following three topics: Information Systems Management, Manufacturing Management, and Technology Entrepreneurship. Twelve credits of coursework must be completed in an area of specialization. New specializations, such as bioengineering or life-sciences technology, may be introduced in the near future.

D. Nine credits of electives can be chosen in any area of interest including the area of specialization.

E. A maximum of six credits of graduate coursework may be transferred for the courses taken elsewhere provided these credits were not used by the previous institution to award the degree. Such transfer of credits will require approval of the graduate committee.

F. Each student will be assigned an academic advisor who must approve the coursework, area of specialization, and sequence of courses.

G. Each student must spend at least one summer working as an intern at an industrial site. In exceptional cases (with the permission from graduate committee), the student may work at a research institution or at a public service organization. All students will be required to submit a report of the work performed as an intern and must receive a satisfactory grade by the advisor (academic advisor or a professor in lieu of the academic advisor with permission from the graduate committee). An evaluation report may be solicited from the immediate supervisor of the student's internship.

Executive Programs

A. Students enrolled in the executive program will require 48 credits of coursework.

B. Each student will be assigned an academic advisor who will review his/her academic progress on a regular basis.

C. Each student will either be assigned or select a faculty member to supervise and grade his/her industrial project. An evaluation report may be solicited from the immediate supervisor of the student in the company who is familiar with the project. Students will be encouraged to select an industrial advisor who can supervise the project jointly with the faculty advisor.

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: Diane Godden, 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 mole-

cules 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 underly 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, *Chairperson.* 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 anticancer agents, MDR reversal agents, and enzyme inhibitors.

Stell, George R.[10], 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 superheated emission sources.

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.

Friedman, Harold L., *Emeritus.* Ph.D., 1949, University of Chicago: Molecular interpretation of equilibrium and dynamic properties of solutions; solvation; excess functions; transport and relaxation coefficients; spectral line shapes; scattering phenomena.

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, Albert[2], *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, Francis[4], 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.

Jona, Franco P.[3], Ph.D., 1949, Swiss Polytechnic Institute (E.T.H.), Switzerland: Studies of solid surfaces and their interactions with surrounding agents; determination of atomic arrangements in surface layers; total-energy calculations aimed at finding metastable phases and experiments aimed at stabilizing such phases by pseudomorphic epitaxy; low-energy electron diffraction (LEED); Auger electron spectroscopy (AES); photoemission (UPS).

Kerber, Robert C.[5], 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.[6], Ph.D., 1987, Stony Brook University: Nuclear chemistry; intermediate and relativistic energy heavy ion reaction studies.

Lauher, Joseph W.[7], 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, Erwin[8], 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.[9], 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.

White, Michael, Ph.D., 1979, University of California, Berkeley: Surface chemical dynamics; catalysis; photo-induced reactions; molecular spectroscopy; molecular beam scattering.

Associate Professors

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.

Millar, Michelle M., Ph.D., 1975, Massachusetts Institute of Technology: Reactivity, electronic, and structural properties of transition metal complexes; organometallic chemistry; bio-inorganic chemistry.

Schneider, Robert F.[11], Ph.D., 1959, Columbia University: Chemical education; web-based instruction; laboratory instruction.

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.

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

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.

Simmerling, Carlos, Ph.D., 1994, University of Illinois, Chicago: Computational chemistry and structural biology; molecular dynamics of biological macromolecules.

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

Bell, Alasdair F., Ph.D., University of Glasgow, Scotland: Investigating protein-ligand interactions using vibrational spectroscopy.

Fowler, Joanna, Ph.D. 1968, University of Colorado: Organic synthesis with short-lived positron-emitting isotopes; neuroscience; drug mechanisms; brain imaging.

Khokhlov, Alexei, Ph.D., 1979, Moscow State University, Russia: Polymer physics; statistical physics of macromolecules; physical chemistry of polyelectrolytes and ionomers.

Newton, Marshall D., Ph.D., 1966, Harvard University: Theoretical chemistry; ab initio electronic structure calculations; prediction and analysis of molecular structure and energetics; elucidation of charge transfer mechanisms in polar media.

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.

Number of teaching, graduate, and research assistants, fall 2003: 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 Materials Science

4) Joint appointment, Department of Pharmacology

5) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1986; Recipient of the President's Award for Excellence in Teaching, 1986

6) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1998; Recipient of the President's Award for Excellence in Teaching, 1998

7) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990; Recipient of the President's Award for Excellence in Teaching, 1990

8) Joint appointment, Department of Biochemistry

8) Joint appointment, Department of Geosciences

10) Joint appointment, Department of Mechanical Engineering

11) 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 three 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, 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, 532, two semesters of CHE 610, 611, and six graduate courses are required, including the following:

1. Two courses from among CHE 501-530. The choice of courses is normally distributed among at least two of the three areas, inorganic, organic, and physical chemistry.

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

In some cases a hybrid of the chemistry and biology requirements may be used.

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.
Prerequisite: CHE 521
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, 0 credits, S/U grading

CHE 532 Literature Seminar
Students select and discuss topics from the current literature.
Spring, 0 credits, 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 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, 0 credits, ABCF grading

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.
Prerequisite (for full-time): Summer session or advancement to candidacy; permission of Graduate Progam Director
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

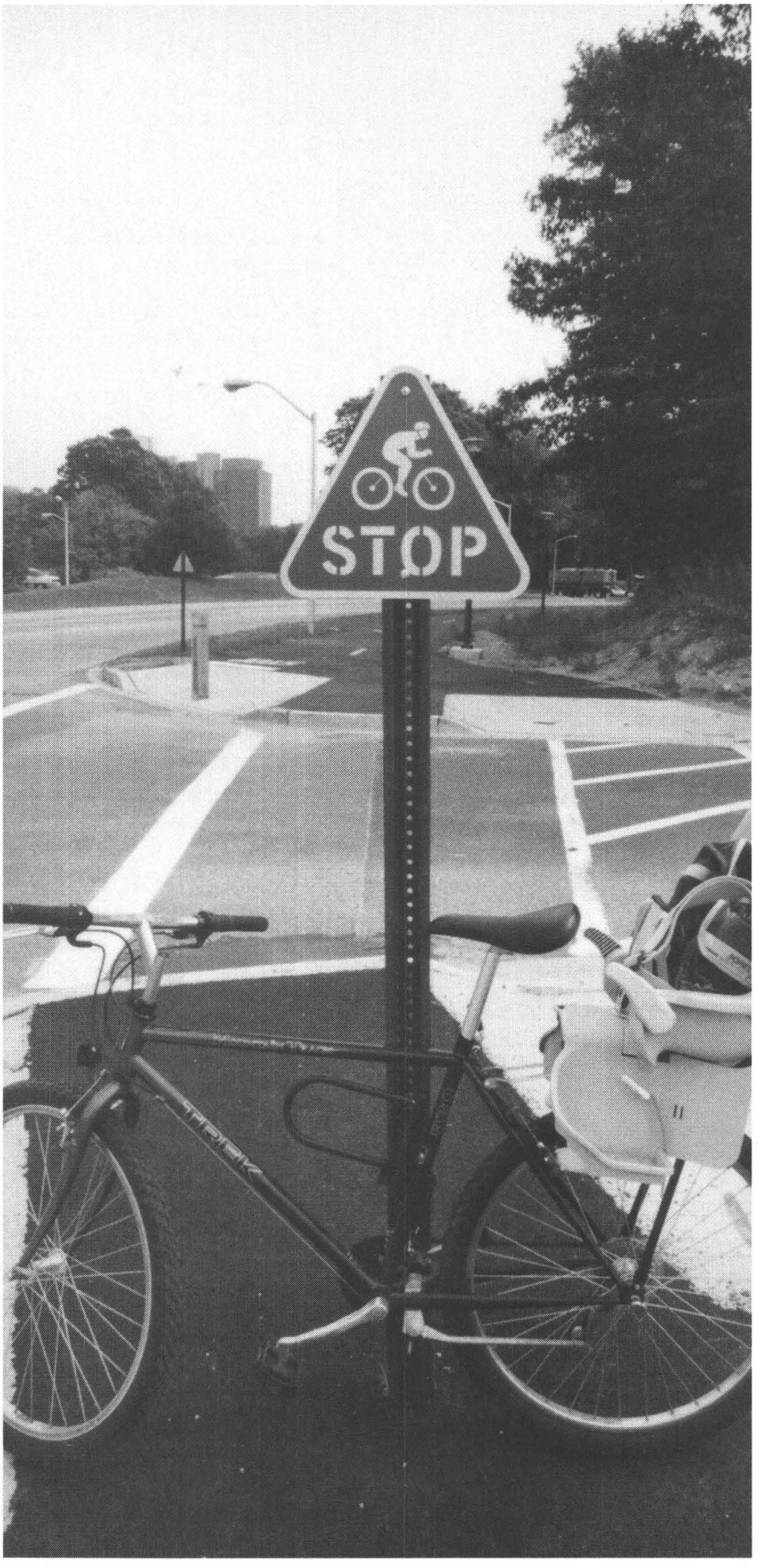
CHE 699 Dissertation Research on Campus
Prerequisite: Must be advanced to candidacy (G5); major portion of research must take

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, Frank Melville Jr., Memorial Library E4309 (631) 632-7460
Graduate Program Director: Ira Livingston, Frank Melville Jr., Memorial Library E4326 (631) 632-9475
Graduate Secretary: Mary Moran-Luba, Frank Melville Jr., Memorial Library E4308 (631) 632-7456

Degrees awarded: M.A. and Ph.D. in Comparative Literature

The Department of Comparative Literature, 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:

1. A B.A. or M.A. degree from a recognized institution and 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 score of 550 or better on the Test of English as a Foreign Language (TOEFL);

5. An appropriate score on the Graduate Record Examination General Test (GRE);

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 $50.

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 there are no predetermined quantitative criteria, which 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 literature 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, Lou[1], 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, Román[2], 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 approach to the arts.

Harvey, Robert[3], *Chairperson.* Ph.D., 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.

Oliver, Kelly, Ph.D., 1987, Northwestern University: 20th-century French philosophy; continental feminist theory; Nietzsche.

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

Livingston, Ira, Ph.D., 1990, Stanford University: Poetics; cultural theory; Romanticism; science studies.

Martinez-Pizzaro, Joaquin, Ph.D., 1976, Harvard University: Medieval literature; classical and medieval backgrounds.

Mirzoeff, Nicholas, Ph.D., 1990, Warwick University: Modern art and visual culture, history of photography.

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.

Trigo, Benigno, Ph.D., 1992, Yale University: Turn-of-the-century Spanish-American literatures; Modernism; literary theory.

Assistant Professors

Chi, Robert, Ph.D., 2001, Harvard University: Modern Chinese literature, cinema, and culture; history and memory.

Kalinowska-Blackwood, Izabela, Ph.D., Yale University: Russian and Polish literature; culture and film.

Visiting Assistant Professor

Perez Megosa, Adrian, Ph.D., 1995, University of Rochester: Cinema and the novel in the Americas; cultural studies.

Adjunct Faculty

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 2003: 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 credtis 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 exams in the fall of 1995 or after that date 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.sunysb.edu/complit.*

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

CLT 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

CLT 800 Summer Research
May be repeated for credit

CLT 850 Summer Teaching
May be repeated for credit

Computer Science (CSE)

Chairperson: Arie Kaufman, Computer Science Building 2431 (631) 632-8470
Graduate Program Director: Michael Kifer, Computer Science Building 1413 (631) 632-8459; Arthur Bernstein, Computer Science Building 1427 (631) 632-8457
Graduate Program Advisor: V. Ramakrishnan, Computer Science Building 1440 (631) 632-8451
Graduate Program Administrator: Dolores Brush, Computer Science Building 1431 (631) 632-8462

Degrees awarded: M.S. in Computer Science; Ph.D. in Computer Science

The Department of Computer Science offers an M.S. and a Ph.D. in Computer Science. The M.S. program 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 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 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*.

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 multigigabyte 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, interlibrary 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

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.

Faculty

Professors

Bachmair, Leo, Ph.D., 1987, University of Illinois, Urbana-Champaign: Computational logic; automated deduction; symbolic computation.

Bernstein, Arthur J., Ph.D., 1962, Columbia University: Transaction processing and workflow management systems; correctness of concurrent systems.

Cleaveland, W. Rance II, Ph.D., 1987, Cornell University: Specification and verification formalisms; automated verification algorithms and tools; models of concurrent computation.

Kaufman, Arie, *Chairperson.* Ph.D., 1977, Ben-Gurion University: Computer graphics; visualization; interactive systems; 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.

Lewis, Philip M., Ph.D., 1956, Massachusetts Institute of Technology: Transaction processing; workflow management; concurrent systems.

Ramakrishnan, I.V., *Graduate Program Advisor.* Ph.D., 1983, University of Texas, Austin: Declarative programming; rewrite systems.

Skiena, Steven, Ph.D., 1988, University of Illinois, Urbana-Champaign: Computational biology; algorithms; discrete mathematics.

Smolka, Scott A., Ph.D., 1984, Brown University: Computer-aided verification of safety-critical systems; model checking; process algebra; visual design languages.

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; interactive systems; artificial intelligence; natural language and logic.

Wittie, Larry D., Ph.D., 1973, University of Wisconsin: Distributed shared memory architectures; distributed operating systems; massively parallel scientific algorithms; computer networks and interconnection topologies; computer architecture; neural networks.

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; stochastic processes and queuing theory; simulation; performance evaluation; modeling and analysis.

Brennan, Susan, Ph.D., 1990, Stanford University: Cognitive psychology; linguistics; human-computer interaction.

Chiueh, Tzi-cker, Ph.D., 1992, University of California, Berkeley: Experimental computer systems; computer architecture; database systems; VLSI hardware design/CAD.

Das, Samir, Ph.D., 1994, Georgia Institute of Technology: Wireless networking; network routing.

Liu, Yanhong Annie, Ph.D., 1996, Cornell University: Programming languages and compilers; program optimization and analysis; programming environments; reactive systems; algorithm design.

Mitchell, Joseph, Ph.D., 1986, Stanford University: Operations research; computational geometry; combinatorial optimization.

Qin, Hong, Ph.D., 1995, University of Toronto, Canada: Computer graphics; geometric modeling; CAD; virtual reality; animation.

Sekar, R.C., Ph.D., 1991, Stony Brook University: Computer security; distributed systems; programming languages/software engineering.

Wasilewska, Anita, Ph.D., 1975, Warsaw University: Logic; knowledge representation; artificial intelligence.

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.

Bender, Michael, Ph.D., 1998, Harvard University: Algorithms; scheduling; data structures; randomization; asynchronous parallel computing.

Grosu, Radu, Ph.D., 1994, Technical University of Munich, Germany: Reactive systems; model checking; design automation for embedded systems; software engineering.

Gupta, Himanshu, Ph.D., 1999, Stanford University: Databases; data mining; data warehousing.

Liang, Jerome, Ph.D., 1987, City University of New York: Medical imaging; image processing.

Mohr, Alexander, Ph.D., 2002, University of Washington: Multimedia communication; error correction coding.

Mueller, Klaus, Ph.D., 1998, Ohio State University: Computer graphics; volume rendering; visualization; image-based rendering; virtual environments; medical imaging.

Oliveira, Manuel, Ph.D., 2000, University of North Carolina, Chapel Hill: Image-based modeling and rendering; computer graphics; image processing; computer vision; scientific visualization.

Ramakrishnan, C.R., Ph.D., 1995, Stony Brook University: Analysis and verification of software; programming language implementation; logic programming; deductive databases.

Samaras, Dimitris, Ph.D., 2000, University of Pennsylvania: Computer vision; computer graphics; medical imaging; animation and simulation; image-based rendering; physics-based modeling.

Stent, Amanda, Ph.D., 2001, University of Rochester: Natural language processing.

Stoller, Scott, Ph.D., 1997, Cornell University: Distributed systems; software testing and verification; program analysis and optimization.

Zadok, Erez, Ph.D., 2000, Columbia University: Operating systems; file systems; storage; networking; software engineering; security.

Number of teaching, graduate, and research assistants, fall 2001: 157

Degree Requirements

Requirements for the M.S. Degree

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 natural 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. They 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 (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 Ph.D. Degree

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; 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.

On-going 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 (other than 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

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 once 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.
Prerequisite: CSE 523
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.
Prerequisite: CSE 345
Spring, 3 credits, ABCF grading

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.
Prerequistie: Limited to CSE/ISE graduate students; others, permission of instructor
3 credits, ABCF grading
May be repeated for credit

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.
Prerequisites: CSE 304 and CSE 307
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.
Prerequisite: CSE 306
Spring, 3 credits, ABCF grading

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

CSE 507 Introduction to Computational Linguistics
Overview of computational approaches to language use. Core topics include mathematical and logical foundations, syntax, semantics and progmatics. 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.
Prerequisites: CSE 537; CSE 541 recommended
Spring, 3 credits, ABCF grading

CSE 508 Computer Security
Topics include issues in computer and information system security: encryption, digital signatures, authentication protocols; threats and vulnerabilities of computer systems; verification of security protocols and vulnerability analysis.
Prerequisites: CSE 306 and CSE/ISE 310
3 credits, ABCF grading

CSE 509 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,

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

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 once for credit

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.
Prerequisite: CSE 307
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.
Prerequisite: CSE 328
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 MGT 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.
Prerequisites: CSE 328 and CSE 332
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.
Prerequisite: CSE 305
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).
Prerequisites: CSE 306 and CSE 310
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 processing, learning, expert systems, AI programming languages and techniques. Covers both theoretical methods and practical implementations.
Prerequisites: MAT 371 or CSE 541
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.
Prerequisite: CSE 303
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.
Pre- or co-requisite: MAT 313 and CSE 213
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).
Prerequisite: CSE 526 or permission of instructor
Spring, 3 credits, ABCF grading

CSE 544 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 represents one or two techniques in detail.
Prerequisite: CSE 305 or CSE 532
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.
Prerequisite for CSE 547: AMS 301
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.
Prerequisite for CSE 548: CSE 373
Recommended prerequisite for AMS 542: AMS 506
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 phylogenic trees.
Prerequisite: CSE 373 or CSE 548; or consent of instructor
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.
Prerequisite for CSE 555: CSE 373 or CSE 548
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 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, 591, 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. 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 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 towards the M.S. degree.
Prerequisite: Permission of graduate program director
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 towards 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

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, S/U grading
May be repeated 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 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.
Prerequisites: Limited to CSE graduate students; others, permission of instructor.
Fall, 3 credits, ABCF grading

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.
Prerequisite: CSE 508 or permission of instructor
Spring, 3 credits, ABCF grading

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.
Prerequisite: CSE 526 or CSE 504
Spring, 3 credits, ABCF grading

CSE 615 Advanced Image Analysis
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. 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 multiresolution 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
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: CSE 306
3 credits, ABCF grading

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 rearrangable capability analysis and performance modeling.
Prerequisite: 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 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

CSE 657 Seminar in Design Analysis

CSE 658 Seminar on Mobile and Wireless Networking

CSE 659 Seminar in Computer Security

CSE 660 Seminar in Media Networks

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

CSE 681 Special Topics in Computer Vision

CSE 682 Special Topics in Design Analysis

CSE 683 Special Topics on Mobile and Wireless Networking

CSE 684 Special Topics in Computer Security

CSE 685 Special Topics in Media Networks

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 General Dentistry; 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
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, hospital dentistry, operative dentistry, oral biology, oral pathology, oral and maxillofacial surgery, orthodontics, pediatric dentistry, 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, advanced education in general dentistry, 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 funding (approximately 2 million dollars per year) from federal, state, and industrial sources. Two faculty members have received prestigious MERIT Research Awards from 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 the 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.: Manuel Lerdau, Life Sciences Building 650 (631) 632-6633
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, may be requested from the graduate program director. Applicants are encouraged to contact faculty.

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 the University's large computer installation, to which staff and students are connected by numerous terminals, there is available within the department a computer facility with a Unx/Linux server.

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

Futuyma, Douglas, Ph.D., 1969, University of Michigan: Ecological genetics; co-evolution of species, especially of plants and insects; evolutionary biology.

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.

Dykhuizen, Daniel E., Ph.D., 1971, University of Chicago: Population genetics and molecular evolution, especially of bacteria.

Eanes, Walter F., Ph.D., 1976, Stony Brook University: Population and biochemical genetics of Drosophila; molecular evolution.

Fleagle, John G.[1], Ph.D., 1976, Harvard University: Primate evolution; comparative anatomy; behavioral ecology.

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., *Graduate Program Director.* Ph.D., 1994, Stanford University: Plant ecology and physiology; global change.

Levinton, Jeffrey S., Ph.D., 1971, Yale University: Marine benthic ecology; population genetics of bivalve mollusks; paleoecology.

Lopez, Glenn R.[3], Ph.D., 1976, Stony Brook University: Marine and freshwater benthic ecology; animal-microbe-sediment interactions; detritus.

Pigliucci, Massimo, Ph.D., 1994, University of Connecticut: Plant population biology; ecological and evolutionary genetics.

Rohlf, F. James, Ph.D., 1962, University of Kansas: Multivariate data analysis techniques applied to problems in taxonomy and ecology; computer modeling; applied ecology.

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, Patricia[7], Ph.D., 1985, City University of New York: Primates and tropical conservation.

Associate Professors

Armstrong, Robert[3], 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, Paul[2], Ph.D., 1979, Harvard University: Regulation of transcription in developing multicellular organisms; the role of transposons in evolution and speciation.

Chase, Ivan[4], 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.

Assistant Professors

Graham, Catherine, Ph.D., 2003, University of Missouri, St. Louis: Landscape and behaviorial ecology.

True, John, Ph.D., 1995, Duke University: Evolutionary and developmental genetics of color patterning in Drosophilia.

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 2003: 30

Students on fellowships: 12

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. The faculty feels that each student will require advanced training in various ancillary disciplines appropriate to the student's chosen field of research. Requirements for any specific student 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 agree 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, 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.
Prerequisites: 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
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.
Prerequisite: Permission of instructor
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: BIO 220, BEE 552, or their equivalents, and a course in evolution
Spring, even years, 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.
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.
Fall, even 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
Spring, 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
Spring, odd years, 4 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

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 credits, S/U grading

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 credits, S/U grading

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 credits, S/U grading

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.
0-2 credits, S/U grading
May be repeated for credit

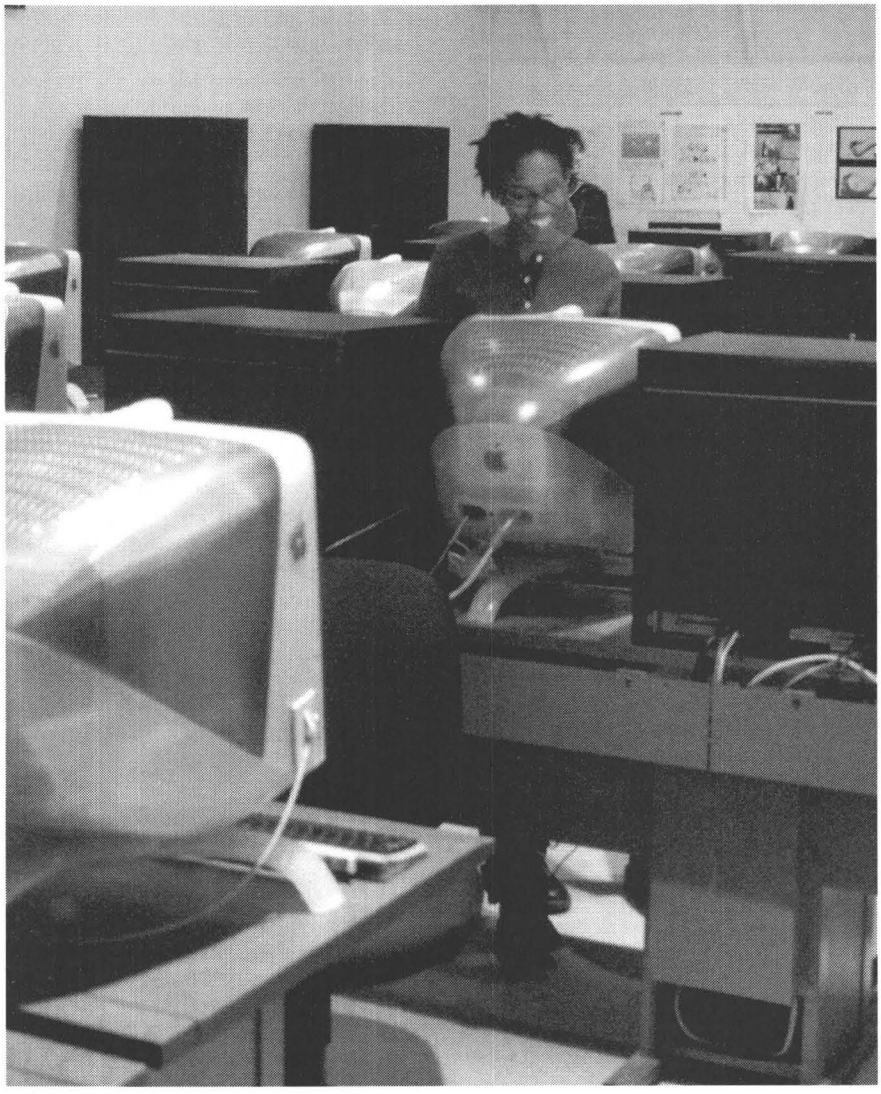
BEE 693 Seminar on Population and Community Ecology
Student seminars on selected topics in population and community ecology.
0-2 credits, S/U grading
May be repeated for credit

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)

Chairperson: William Dawes, Ward Melville Social and Behavioral Sciences Building N-605 (631) 632-7556
Graduate Program Director: Thomas J. Muench, Ward Melville Social and Behavioral Sciences Building S-601 (631) 632-7530
Graduate Secretary: Janice Byron, 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 both the Ph.D. program. It sometimes admits students into the M.A. program. The admission requirements and courses are identical for both programs. All students are eligible to receive the M.A. degree if they have met the degree requirements listed later in this section. 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 probablity 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 55 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, Massachusetts Institute of Technology: Game theory; mathematical economics.

Hause, John C., Ph.D., 1962, University of Chicago: Industrial organization; microeconomics; econometrics.

Hool, R. Bryce, Ph.D., 1974, University of California, Berkeley: Macro theory; general equilibrium theory.

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.

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.

Assistant Professors

Armantier, Olivier, Ph.D., 1998, University of Pittsburgh: Econometrics; experimental economics.

Benitez-Silva, 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.

Haimanko, Ori, Ph.D., 2000, Hebrew University: Game Theory; public choice; industrial organization.

Swann, Christopher, Ph.D., 1996, University of Virginia: Labor economics; public economics; health economics.

Lecturer

Dawes, William, *Chairperson.* Ph.D., 1972, Purdue University: Econometrics; economic history.

Number of teaching, graduate, and research assistants, fall 2003: 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 completed 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: ECO 500, 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 equilibri-

um 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: ECO 510, 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: ECO 520, 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: ECO 521, 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 Banzhaff 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 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 for AMS 555: AMS 552/ECO 604
Prerequisites for ECO 605: ECO 604 and 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.
Prerequisites: ECO 501, ECO 604, ECO 605, or permission of instructor, graduate standing in the Economics Department or permission of the Graduate Director
Fall or 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: ECO 612, 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: ECO 521, graduate standing in the Economics department or permission of the Graduate Program Director
Spring, 0-3 credits, ABCF grading

ECO 629 Studies in Quantitative Methods
Prerequisite: ECO 521; Graduate standing in the Economics department or permission of the Graduate Program 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.
Prerequisites: ECO 501, ECO 521, graduate standing in the Economics Department or permission of the Graduate Program 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.
Prerequisites: ECO 501, ECO 521, graduate standing in the Economics Department or permission of the Graduate Program 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: ECO 501, graduate standing in the Economics Department or permission of the Graduate Program 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: ECO 501, graduate standing in the Economics Department or permission of the Graduate Program 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.
Prerequisite: ECO 501, graduate standing in the Economics Department or permission of the Graduate Program Director
0-3 credits, ABCF grading

ECO 646 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.
Prerequisites: ECO 501, ECO 521, graduate standing in the Economics Department or permission of the Graduate Program 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
Fall or 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.
Fall or 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 Program Director and three semesters of coursework in the Ph.D. program
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 Program 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: Pre-approved participation in Economics Department activity
0 credits, S/U grading

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.
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. 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 all 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) 682-6810 (Voice/TDD).

Teacher preparation programs are offered in the following subject areas:

Certification Grades 7 through 12:

Sciences and General Science: Biology, Chemistry, Earth Science, Physics
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, a 300-word essay describing their personal qualifications and explaining their views on contemporary issues in education, and additional requirements set by the academic department.

B. Students must complete all pedagogy courses encompassed in the pro-

fessional 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).

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

Lynda Adams, Science, M.A.
Charles Backfish, History, A.M.
David Bynum, Cell Biology-Biochemistry, Ph.D.
William Collins, Biology, Ph.D.
Cecilia Cutler, TESOL, Ph.D.
Margo DelliCarpini, TESOL, M.A.
Patricia Dunn, English, D.A.
Georges Fouron, Africana Studies, Ed.D.
Lawrence Frohman, History, Ph.D.
Lauren Garlick, TESOL, Linguistics, M.A.
Gilbert Hanson, Geosciences, 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.
Mike Ledgerwood, European Languages, Literatures, and Cultures, Ph.D.
Kenneth Lindblom, English, Ph.D.
Bernard Maskit, Mathematics, Ph.D.
Robert McCarthy, Physics and Astronomy, Ph.D.
Lester Paldy, Science Outreach, M.S.
Anthony Phillips, Mathematics, Ph.D.
Neil Portnoy, Mathematics, Ph.D.
Prosper Sanou, European Languages, Literatures, and Cultures, Ph.D.
Zuzana Zachar, Cell Biology-Biochemistry, Ph.D.

Note: Additional affiliated content faculty are listed within the departments of the relevant disciplines.

Adjunct

Dennis Allendorph, Science, M.A.
William Bernhard, Mathematics, M.A.
Lynn Boyle, Social Studies, M.S.
Marianne Catalano, TESOL, M.A.
Richard Feldman, Science, M.A.
Janet Fenstermacher, Mathematics, M.S.
Ronald Frevola, English, M.A.
Phyllis Heger-Heinen, Mathematics, M.S.
Genevieve Heidrich, History, M.S.W.
Paul Kaplan, Psychology, Ph.D.
Harvey Karron, History, M.A./M.S.
Gerald Lannigan, History, M.A.
Michael LoMonico, English, M.A.L.S.
Natalie Lukas, NYC Coordinator, M.S.
Barbara McAdorey, History, M.A.
William Schiavo, English, M.A.
Pamela Selzer, TESOL, M.A.
Gerald Slutzky, Science, M.A./M.S.
Peter Smiles, English, M.A.
Bongsoon Zubay, SUTEC, Ed.D.

Number of teaching assistants, fall 2003: 3

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 Adolescent Growth and 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. 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 the School of Professional Development's (SPD) Web site *(www.sunysb.edu/spd/graduate studies.htm)*. 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 36 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 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) 632-7403

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: Foreign Languages

A. Program Description

The Master of Arts in Teaching (MAT): Foreign Langauges programs are designed as courses of study leading to New York State certification for teaching French, Italian, German, 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 and the Professional Education Program and are designed for those with little or nor previous coursework in education or formal classroom teaching experience.

*A M.A.T. Spanish program is pending approval by NYSED.

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

Professional Studies in Education (23 credits)

CEE 505 Education: Theory and Practice

CEE 565 Adolescent Growth and Development

FLA 505 Methods of Teaching Foreign Languages

FLA 506 Portfolio 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 581; co-requisites: FLA 551 and 552)

FLA 581 Foreign Language Teaching Independent Project (co-requisite: FLA 540)

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 581; co-requisites: FLA 552 and 554)

FLA 552 Supervised Student Teaching Middle School Grades 7-9: Foreign Languages (prerequisites: FLA 505, 506, 540, and 581; co-requisites: FLA 551 and 554)

Final Project

Students are required to submit a professional portfolio at the completion of the program.

C. 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.

Application Procedure

Applications and instructions are available on SPD's Web site (*www.sunysb.edu/spd/graduatestudies.htm).* 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 36 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 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. Requirements

You 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 your overall bachelor's degree program and a minimum GPA of 3.0 in Mathematics studies. 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 of advanced calculus; geometry, including non-Euclidean geometry; probability and/or statistics. You must also have taken at least one mathematics course that significantly uses computers and/or graphing calculators. You must demonstrate, through your application and recommendations, that you possess the temperament and disposition to be an effective teacher. Your academic transcript must indicate that you 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 (*www.sunysb.edu/spd/graduatestudies.htm*). 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 36 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 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: *Bernard.Maskit@stonybrook.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)

CEB 546 Current Topics in Biotechnology

CEB 547 Current Topics in Molecular Genetics

CEB 548 Current Topics in Microbiology

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

Professional Studies in Education (20 credits)

CEE 505 Education: Theory and Practice

CEE 565 Adolescent Growth and Development

SCI 510 Introduction to Science Teaching (co-requisite: SCI 541)

SCI 520 Science Teaching Methods (prerequisite: SCI 510; co-requisite: SCI 542)

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: socioeconomically 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. 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 (*www.sunysb.edu/spd/graduatestudies.htm*). 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 36 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 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

Social Studies, with a concentration in history, is a course of study leading 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 39 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 Adolescent Growth and 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. 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. 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, by April 15.

Application Procedure

Applications and instructions are available on SPD's Web site (*www.sunysb.edu/spd/graduatestudies.htm*). 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

For admission to the MAT program in social studies education, applicants must have an undergraduate major in history of one of the social sciences or have completed a course of study equivalent to a Stony Brook major in one of these disciplines.

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.

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 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. Applications and supporting documentation (including GRE's) for the spring term must be received by November 15; for the fall term, by April 15.

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. 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 (*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

South African rock art

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 and computer graphics, micro and optoelectronics/ VLSI, telerobotics, 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; inter-connection networks and high speed packet switching; 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/or high performance computer architecture, embedded microprocessor system design, fault tolerant computing, design communications and signal processing, parallel and distributed computing, computer networks, 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 equip-

ment 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, Speech, and Vision (CSPV) Laboratory has several SUN workstations and desktop computers with specialized software for research in telecommunications networks and signal processing. The computers are networked 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 with emphasis on collective communications. The laboratory has one Sun Ultra workstation with dual processors and four Sun Ultra 5 workstations. All machines are networked and running UNIX operating systems.

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 equipped with SUN SPARC 10, SPARC 2, HP730 workstations and a full complement of peripherals.

The Optical Signal Processing and Fiber Optic Sensors Laboratory is equipped to perform research in the broad area of optoelectronics. Some of the current research projects include development of fiber optic systems for real time process control in adverse environments, integrated fiber optics, fiber optic sensors, and coherent optical processing.

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 Linex, 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 hetero-barrier 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.

Rappaport, Stephen S., *Emeritus.* Ph.D., 1965, New York University: Communication theory; systems.

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: Parallel and distributed computing and systems; high-speed networks; optical/wireless networks; high performance computer architecture and fault-tolerant computing.

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. Iaffe Physical-Technical Institute, St. Petersburg, Russia: Semiconductor devices, including microwave and optoelectronics.

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.

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.

Leuciuc, Adrian, Ph.D., 1996, Technical University of Iasi, Romania: Analog integrated circuits design, nonlinear circuits and systems, nonlinear and adaptive signal processing.

Pacelli, Andrea, Ph.D., 1998, Politecnico di Milano, Milan, Italy: Compact modeling of electromagnetic and thermal effects in integrated circuits; physics and simulation of heterojunction bipolar transistors.

Number of teaching, graduate, and research assistants, fall 2003: 43

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 compatable 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 selfisimilar 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 comm., voice and data applications, design basics for wireless modems, analysis of system issues like resource management and handoff, cellular and wireless LAN systems. It is suggested that students have a background in Undergraduate Probability and Statistics and Undergraduate Communications.
Fall or spring, 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 operation through the design of large analog 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 desribed 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 rearrangable 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, multidimensional 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 mea-

surements 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
Discussion and case studies of practical problems in engineering designed specially for part-time graduate students, relating to their current professional activity. Registrants must have the prior approval of the graduate studies director. The grade will be assigned, and credit granted, upon submission of a written report or seminar presentation of the work performed.
Fall and spring, 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: Peter Manning, Humanities Building 254 (631) 632-7784
Graduate Program Director: Heidi Hutner, Humanities Building 194 (631) 632-7784
Graduate Secretary: Carol DeMangin, Humanities Building 265 (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, and two have been appointed SUNY Distinguished Teaching Professors. 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 an annual conference of international speakers.

Students enrolled in the Master of Arts program pursue a course of study consisting of courses in historical periods, literary genres, and various single authors. The program offers students the opportunity to broaden as well as deepen their knowledge of literature written by others. This course of study leads to the Master of Arts degree and requires 30 credits 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. Students with a particular interest in women's studies may pursue the interdisciplinary graduate certificate in women's studies; those interested in cultural studies can pursue the graduate certificate in cultural 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 must enroll in the Teaching Practicum, which provides them with supervision during their first semester of teaching at Stony Brook. Teaching assignments are varied and flexible. Teaching assistants teach courses in composition or introductory courses in literature, tutor students in the Writing Center, and assist professors in large lecture courses. 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 February 1 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 midyear 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 in Princeton, New Jersey. Applicants who live outside New York State should contact the nearest university. While we have no set cutoff score for admission, we pay special attention to the score on the verbal section of the examination. The quantitative and analytical scores are secondary.

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. 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

Levy, Jonathan[2], Ph.D., 1966, Columbia University: Playwrighting; 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.

Kaplan, E. Ann, *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.

Kenny, Shirley Strum, *President of the University.* Ph.D., 1964, University of Chicago: Restoration and 18th-century British drama.

Martinez-Pizarro, Joaquin[5], 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, *Undergraduate Program Director.* 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.

Dolan, Paul, Ph.D., 1966, New York University: Modern British and American literature; Yeats; literature and politics.

Haralson, Eric, Ph.D., 1993, Columbia University: 19th- and 20th-century British and American literatures; men's studies; Henry James.

Hutner, Heidi, *Graduate Program Director.* Ph.D., 1993, University of Washington: Restoration and 18th-century studies; colonial and postcolonial discourse; women writers; women's studies.

Livingston, Ira, Ph.D., 1990, Stanford University: Romanticism; literary and interdisciplinary theory; poststructuralism; cultural physics and poetics; literature and science.

Losey, Kay, *Director of the Writing Program.* Ph.D., 1992, University of California at Berkeley: Rhetoric and composition.

Scheckel, Susan, Ph.D., 1992, University of California, Berkeley: 19th-century American literature and culture.

Sheehan, David, Ph.D., 1974, University of Wisconsin-Madison: Late 17th- and 18th-century British literature; contemporary Native American literature.

Assistant Professors

Chiasson, Daniel, Ph.D., 2002, Harvard University: Lyric poetry; contemporary poetry; the writing of poetry.

Johns, Gillian, Ph.D., 2000, Temple University: African American literature and culture; vernacular literature and culture; genre and narrative theory; critical race theory.

Marshik, Celia, Ph.D., 1999, Northwestern University: British and transatlantic modernism, women's studies.

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.

Wakanker, Milind, Ph.D., 2002, Columbia University: Post-colonial literature and theory; vernacular literatures.

Number of teaching, graduate, and research assistants, fall 2001: 40

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

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 final paper. Of the ten courses, one must be in Shakespeare, one must be in Chaucer or Milton, one must be in American literature, and one must be in the history and structure of the English language, although courses previously taken on the undergraduate level and passed with a grade of B or better may be accepted as fulfilling these require-

ments. The other six courses must include one in at least four of the following eight areas:

1. Old and Middle English
2. Renaissance (1500-1660)
3. Restoration and 18th Century
4. 19th-Century British
5. American Literature to 1900
6. 20th-Century British and American
7. Literary Theory
8. Classical Backgrounds

Note: Courses taken to satisfy the Shakespeare and Chaucer or Milton requirements cannot be used to satisfy area distribution. Courses run through the School of Professional Development are not accepted for these 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. M.A. Paper

The M.A. paper will be a paper completed in a 500-level course, revised 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 essay. If the second reader disapproves, the graduate program director will select a third reader to judge the paper, and the opinion of two readers will determine approval or disapproval of the paper. A final copy of the paper and written approvals from the readers must be submitted by the last day of classes in the semesters 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.

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 fall semester in the Ph.D. 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' studying and 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 15-30 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 problem 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 problem 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 Office 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 Office 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 names of the committee members to the Graduate Office of the department for its 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 dis-

sertation 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, 9 for G4 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; for example, there are students whose careers may fall into two widely separated phases, whose previous records may show only a minor rather than a major interest in English or comparative literature, whose academic preparation now seems remote, or whose recent experiences have kindled new interests.

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

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: Matriculation in a graduate program

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

EGL 515 Middle English Language and Literature

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

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

EGL 545 Studies in Victorian Literature

EGL 547 Late 19th-Century British Literature

EGL 550 20th-Century British Literature

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

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

EGL 582 Drama Workshop
Prerequisite: 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

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

EGL 599 Independent Study
Prerequisite: Enrollment in the English M.A., Ph.D., or M.A.T. programs
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 catagories.
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
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
May be repeated for credit

Wolfie, the Seawolves mascot, poses in front of the fountain.

European Languages, Literatures, and Cultures (GER, RLF, RLI, SLV, DLG, DLF, DLI, DLL, DLR)

Chairperson: Nicholas Rzhevsky, Frank Melville Jr. Memorial Library N-4004 (631) 632-7440
Graduate Program Director: Andrea Fedi, Frank Melville Jr. Memorial Library N-4004 (631) 632-7440
Graduate Secretary: Joan Vogelle, Frank Melville Jr. Memorial Library N-4008 (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.sunysb.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 Cuture: For students who wish to follow a broadly based M.A. program designed for a wide array of careers engaging Romance languages, literatures, and cultures, or to undertake further study on the doctoral level. Successful completion of the degree allows entry into the D.A. program or to proceed toward the Ph.D. The flexibility of this track allows students to design a curriculum including study of the literature, linguistics, or culture of one of the Romance languages or in a combination of two Romance languages. Students have the 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. [These programs are temporarily suspended.]

M.A.T. Program in French 7-12, German 7-12, Italian 7-12, Russian 7-12

Consult the School of Professional Development 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 labo-

ratories, 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 department is housed in the Frank Melville Jr. Memorial Library, which includes 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;

G. 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.

Rizzuto, Anthony, *Emeritus.* Ph.D., Columbia University: 19th- and 20th-century French language and 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, Ph.D., University of Wisconsin, Madison: Italian American studies, English literature.

Fedi, Andrea, *Director of Graduate Studies.* Laurea in Lettere e Filosofia, Università di Firenze; Ph.D., University of Toronto: Italian Renaissance literature; historiography.

Franco, Charles, *Academic Advisor of Italian Undergraduate Program, Coordinator of Medieval Studies Program.* Ph.D., Rutgers University: Medieval Italian literature.

Kerth, Thomas A.[1], 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.

Weinreb, Ruth Plaut, *Emerita.* Ph.D., Columbia University: 18th-century French literature.

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.: Pedagogy and teacher training; French language.

Kalinowska-Blackwood, Izabela, Ph.D., Yale University: Russian and Polish literature, culture, and film.

Ledgerwood, Mikle, *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

Godfrey, Aaron W., *Coordinator of Classics Studies Program.* M.A., Hunter College: Latin; Medieval studies.

Rijssenbeek, Mariolein, M.A., M.S.W., Stony Brook University: French language and culture.

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

Balducci, Gioacchino, M.A., NYU: Italian language, literature, and cinema.

Dolezal, Stana, D.A., Stony Brook University: Eastern European literature and culture; Czech language.

Grenkov, Tatayana, 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, *Supervisor of Student Teaching Program.* M.A., Hofstra University: Pedagogy.

Schaffer, Ronalee, M.A., Teachers College, Columbia University: French language and culture.

Scricco, Frank, D.A., Stony Brook University: Italian language and culture.

Van Hecke, Alise, Teachers College, Columbia University: French.

Varuolo, Franco, M.A., Stony Brook University: Italian language and culture; methodology.

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, Robert[3], *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.[4], *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, Hélène, *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, Barbara[5], *Distinguished Teaching Professor,* Ph.D., New York University: Romanticism; German cultural studies.

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.

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, 1992; Recipient of the President's Award for Excellence in Teaching, 1992

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, 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, 1973

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)

4. 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 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 321, 322, 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 consulta-

tion 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.

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.)
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or spring, 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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

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-AHLS 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. This course is offered as both ITL 501 and CEH 595.
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.
Fall or 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.
Fall or 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.
Prerequisite: Graduate status
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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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

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: French
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: French
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: French
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.
Prerequisites: FLA 505 and FLA 506
Fall or 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.
Prerequisites: FLA 505 and FLA 506
Fall or 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.
Fall or 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.
Fall or spring, 3 credits, ABCF grading

DLL 602 Externship in Language Center Directorship
As above in DLL 601 except work is done of campus in a Language Center not located at the University.
Fall or spring, 3 credits, S/U grading

Genetics (BGE)

Graduate Program Director: J. Peter Gergen, Center for Molecular Medicine, Room 436 (631) 632-9030
Graduate Program Coordinator: Robyn Fillinger, 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 the 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 very heterogeneous backgrounds. The first year experience includes laboratory rotations in which the student works in the laboratories of four different faculty members. These rotations allow the student to gain first hand 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 their work to their 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 Appplied 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 constructed adjacent to the Life Sciences Building. This building houses four interdepartmental thematic research centers (i.e., the Centers for Developmental Genetics, Infectious Diseases, Brain and Spinal Cord Research, and Structural Biology), each of which involves 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, including access to the National Synchotron Light Source, provide additional unique resources for trainees in the Genetics Program. 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;

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 2004-2005 academic year includes a $23,000 stipend, a full tuition scholarship, and health insurance. This same package is provided each year to continuing students in the program.

Faculty

Distinguished Professors

Grollman, Arthur[6], 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, Rolf[2], Ph.D., 1967, Harvard University: Yeast molecular genetics.

Wimmer, Eckard[3], Dr.rer.nat., 1962, Gottingen, Germany: Poliovirus replication and picornaviral pathogenesis.

Professors

Bahou, Wadie[5], M.D., 1980, Massachusetts Medical Center: Human genetics; gene therapy.

Bar-Sagi, Dafna[3], Ph.D., 1984, Stony Brook University: Role of ras oncogenes in cell proliferation; signal transduction.

Bell, Michael[4], Ph.D., 1976, University of California, Los Angeles: Evolutionary genetics.

Benach, Jorge[3], 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, Daniel[6], M.D., 1977, Stanford University: Molecular biology of oocyte development.

Brown, Deborah[2], Ph.D., 1987, Stanford University: Structure and function of sphingolipid and cholesterol-rich membrane domains.

Citovsky, Vitaly[2], 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-Tien[5], Ph.D., 1979, Yale University: Cancer invasion and angiogenesis.

Dykhuizen, Daniel[4], Ph.D., 1971, University of Chicago: Causes of natural selection in microorganisms.

Eanes, Walter[4], Ph.D., 1976, Stony Brook University: Genetic variation in natural populations.

Fisher, Paul[6], M.D., Ph.D., 1980, Stanford University: DNA replication; nuclear architecture; nuclear transport.

Furie, Martha B., Ph.D., 1980, Rockefeller University: Molecular basis of cell-cell and cell-substrate interactions.

Gergen, J. Peter, *Graduate Program Director.*[2] 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, Patrick[3], Ph.D., 1980, Northwestern University: Adenovirus regulation of cellular proliferation and gene expression; vectors for human gene therapy.

Katz, Eugene[3], Ph.D., 1969, University of Cambridge: Genetic studies on Dictyostelium discoideum.

Malbon, Craig[6], Ph.D., 1976, Case Western Reserve University: Signal transduction and gene regulation in differentiation and development.

Mandel, Gail[1], 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, Nancy, Ph.D., 1972, University of North Carolina, Chapel Hill: Biostatistics.

Moll, Ute[8], M.D., 1985, University of Ulm: Tumor suppressor genes; role of p53 in human cancer.

Reich, Nancy[8], Ph.D., 1983, Stony Brook University: Signal transduction and activation of gene expression by cytokines; cellular defense responses to viral infection.

Rubin, Clinton[9], Ph.D., 1983, Bristol University: Physical factors influencing bone, cell, and tissue kinetics; treatments.

Schechter, Nisson[2], Ph.D., 1970, Western Michigan University: Molecular biology of nerve development and regeneration.

Skiena, Steve[12], Ph.D., 1988, University of Illinois: Computational biology and informatics.

Smith, Steven[2], Ph.D., 1985, University of California, Berkeley: Structural biology.

Associate Professors

Bingham, Paul[2], Ph.D., 1979, Harvard University: Regulation of differentiation; transposable elements; regulation of splicing.

Dean, Neta[2], Ph.D., 1988, University of California, Los Angeles: Protein trafficking in yeast.

Frohman, Michael[6], M.D., Ph.D., 1985, University of Pennsylvania: Early mammalian development.

Futcher, A. Bruce[3], D.Phil., 1981, University of Oxford: Control of cell division in eukaryotic cells.

Hollingsworth, Nancy[2], Ph.D., 1988, University of Washington: Meiotic chromosome synapsis, recombination, and segregation in yeast.

Holdener, Bernadette[2], Ph.D., 1990, University of Illinois: Genetics of mammalian development.

Kernan, Maurice[1], Ph.D., 1990, University of Wisconsin: Molecular basis of mechanical senses.

Kisker, Caroline[6], Ph.D., 1994, Free University of Berlin, Germany: Structure/function relationships of macromolecules using crystallography and biochemical methods.

Konopka, James[3], Ph.D., 1985, University of California, Los Angeles: Cell growth and development in yeast; pheromone signal transduction.

Leatherwood, Janet[3], Ph.D., 1993, Johns Hopkins University: Cell cycle control of DNA replication.

Mackow, Erich, Ph.D., Temple University: Rotavirus and hantavirus pathogenesis; virus directed cell signaling and transcriptional responses.

Prives, Joav, Ph.D., McGill University: Regulation of surface receptors in muscle cells.

Reinitz, John[11], Ph.D., 1988, Yale University: Computational biology; modeling of gene regulatory networks.

Schindelin, Hermann[2], Ph.D., 1994, Free University of Berlin, Germany: Structure.

Thomsen, Gerry[2], Ph.D., 1988, Rockefeller University: Vertebrate embryo development.

Assistant Professors

Bharathan, Geeta[4], Ph.D., 1993, University of Arizona: Plant development and evolution.

Crawford, Howard, Ph.D., 1993, University of Texas Southwestern Medical Center at Dallas.

Hadjiargyrou, Michael[9], 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-Chih[2], Ph.D., 1994, Duke University: The molecular mechanism of Wnt signaling.

Karzai, Wali[2], Ph.D., 1995, Johns Hopkins University: Structure and function of RNA-binding proteins and biochemical studies of the SmpB-SsrA quality control system

Neiman, Aaron[2], Ph.D., 1994, University of California, San Francisco: Developmental regulation of the secretory pathway.

Sirotkin, Howard[1], Ph.D., 1996, Albert Einstein: Specification and patterning of the neural plate; vertebrate developmental genetics.

Thanassi, David[3], Ph.D., 1995, University of California, Berkeley: Biogenesis of bacterial adhesion organelles.

True, John[4], Ph.D., 1995, Duke University: Drosophile melanin patterning; developmental genetics and natural selection.

Tsirka, Stella[6], Ph.D., 1989, Aristotelian University of Thessaloniki, Greece: Tissue plasminogen activator in the mammalian hippocampus; neuronal-microglial interactions.

White, Thomas[12], Ph.D., 1994, Harvard Medical School: Gap junction functions defined by genetic diseases and gene knockouts.

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.

Helfman, David, *Professor.* Ph.D., 1981, Emory University: Molecular basis for tissue-specific alternative RNA splicing; role of the cytoskeleton in cellular functions.

Hernandez, Nouria, *Professor.* Ph.D., 1983, Heidelberg, Germany: Transcription initiation and termination in human snRNA genes and HIV-1 LTR.

Herr, Winship, *Professor.* Ph.D., 1982, Harvard University: Control of eukaryotic transcription.

Hirano, Tatsuya, *Professor.* Ph.D., 1989, Kyoto, Japan: Higher order chromosome structure and function.

Huang, Z. Josh, *Assistant Professor.* Ph.D., 1994, Brandeis University: Neuroscience; experience-dependent development of the neocortex; mouse genetics; neurotrophins.

Jackson, David, *Professor.* Ph.D., 1991, East Anglia, England: Plant development; genetics, cell-to-cell mRNA, and protein trafficking.

Joshua-Tor, Leemor, *Associate 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.

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, *Associate Professor.* Ph.D., 1982, University of Michigan: Computational molecular biology.

Mills, Alea, *Assistant 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.

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, Bill, *Associate Professor.* Ph.D., 1991, University of Sydney: Cell cycle; gene regulation.

Timmermans, Marja, *Assistant 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, *Associate Professor.* Ph.D., 1990, Brandeis University: Structural biology; protein-RNA interactions.

Yin, Jerry, *Associate Professor.* Ph.D., 1986, University of Wisconsin-Madison: Genetics of learning and memory in drosophila.

Zhang, Michael, *Professor.* Ph.D., 1987, Rutgers University: Computational biology and genome informatics.

Zhong, Yi, *Associate 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 2003: 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

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/ 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 during the first and second years of study. Students select from thematic journal club topics that are organized each semester by faculty 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 course 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 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 first semester.

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 by the end of the sixth semester of graduate study. Generally, the faculty that participate on 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 conjuction 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.
Prerequisite: Permission of instructor
Fall and spring, 1-8 credits, S/U grading
May be repeated once 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
Prerequisite: Permission of instructor
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: William E. Holt, Earth and Space Sciences Building 334 (631) 632-8215
Graduate Secretary: Loretta 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 crystal chemistry, geochemistry, mineral and rock physics, petrology, sedimentary geology, and seismology and tectonics (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 laboratory facilities and modern instrumentation have helped to foster a well-earned reputation for experimental, multifaceted approaches to Geoscience research. Cooperative programs with other departments, nearby institutions, and national laboratories provide access to unique facilities (e.g., NSLS).

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.

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, compressibilities, 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.

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.

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 drive 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.

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.

Faculty

Distinguished Professors

Lindsley, Donald H., 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

Aller, Robert C.[1], Ph.D., 1977, Yale University: Marine geochemistry; early marine diagenesis.

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

Bokuniewicz, Henry J.[1], Ph.D., 1976, Yale University: Marine geophysics.

Cochran, J. Kirk[1] , Ph.D., 1979, Yale University: Marine geochemistry; use of radionuclides as geochemical tracers; diagenesis of marine sediments.

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.

Geller, Marvin[1], Ph.D., 1969, Massachusetts Institute of Technology: Atmospheric dynamics; upper atmosphere; climate variability; aeronomy; physical oceanography.

Harbottle, Garman[3], Ph.D., 1949, Columbia University: Nuclear chemistry; archaeology.

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.

Krause, David W.[2], Ph.D., 1982, University of Michigan: Vertebrate paleontology; mammalian evolution, including primates.

Nekvasil, Hanna, Ph.D., 1986, Pennsylvania State University: Experimental and thermodynamic investigations of mineral/melt equilibria in silicic magmas.

McLennan, Scott M., Ph.D., 1981, Australian National University: Geochemistry of sedimentary rocks; sedimentary petrology.

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

Brownawell, Bruce[1], Ph.D., 1986, Woods Hole Oceanographic Institute: Biogeochemistry; environmental chemistry; diagenesis.

Forster, Catherine A.[2], Ph.D., 1990, University of Pennsylvania: Vertebrate paleontology; systematics; functional morphology.

Research Associate Professors

Gasparik, Tibor, Ph.D., 1981, Stony Brook University: Phase equilibria studies of candidate mantle materials at high temperatures and pressures.

Vaughan, Michael T.[4], Ph.D., 1979, Stony Brook University: Experimental geophysics; crystallography; synchrotron X-ray studies.

Assistant Professors

O'Leary, Maureen[2], Ph.D., 1997, Johns Hopkins: Vertebrate paleontology; phylogenetic systematics; mammalian evolution.

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.

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.

Research Assistant Professors

Chen, Jiuhua[4], Ph.D., 1994, Institute of Materials Structure Science, KEK: Mineral physics; mantle petrology; application of synchrotron radiation to earth sciences.

Li, Baosheng[4], Ph.D., 1996, Stony Brook University: Mineral physics; elasticity of minerals; high-pressure research.

Lecturer

Stidham, Christiane Wilson, Ph.D., 1999, University of California, Berkeley: Geophysics.

1) Affiliated appointment, Marine Sciences Research Center

2) Affiliated appointment, Department of Anatomical Sciences

3) Affiliated appointment, 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 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 professer. 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.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 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, it if 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 four separate steps in this procedure: (1) presentation of a departmental seminar followed by a discussion of the student's research and evaluation of the recent literature before a committee appointed by the graduate committee, (2) submission of a proposal abstract to the graduate committee, who then select an examining committee, (3) submission of the thesis proposal to the examining committee, and (4) 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 six scientists holding Ph.D. degrees who are experts in fields related to the proposal, at least five of whom (including the nonvoting chair) 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.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, 0 credits, S/U 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 occurence. 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 presented by visiting scientists as well as by the faculty. Required every semester of all geoscience graduate students.
Fall and spring, 0 credits, S/U grading

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, 0 credits, S/U grading

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, theses are discussed.
Fall and spring, 0 credits, S/U grading
May be repeated

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 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

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 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

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) 444-23198

Advanced Certificate Program in Health Care Management

Program Director: Alan Leiken

Advanced Certificate Program in Community Health

Program Director: Nanci Rice

Occupational Therapy Program (BS/MS)

Program Director, Vera Jean Clark-Brown, Health Sciences Center Level 2, Room 469, (631) 444-3185

Physical Therapy Program (DPT)

Department Chair, Richard Johnson, Health Sciences Center Level 2, Room 419, (631) 444-3250

Hispanic Languages and Literature (SPN)

Acting Chairperson: Lou Charnon-Deutsch, Frank Melville Jr. Memorial Library N3015 (631) 632-6935/6031
Graduate Program Director: Benigno Trigo, Frank Melville Jr. Memorial Library N3013 (631) 632-1349
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 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. 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, Louise[1], *Emeritus.* Ph.D., 1969, University of California, Berkeley: Medieval literature; translation theory; literature and linguistics; romance philology.

Associate Professors

Klein-Andreu, Flora, 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.

Trigo, Benigno[3,4], *Graduate Program Director.* Ph.D., 1992, Yale University: 19th- and 20th-century literatures; modernism; literary theory; psychoanalysis.

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

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.

Visiting Assistant Professors

Pérez-Melgosa, Adrián[3], Ph.D.,1995, University of Rochester: Film and literature in the Americas; cultural studies; film studies.

Polit-Dueñas, Gabriela, Ph.D., 2002, New York University: Contemporary Latin American literature; gender and critical theories.

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.
Schueren, Teresa, M.A., 1998, 2001, Stony Brook University: French and Hispanic languages and literatures.
Segura, Eduardo, M.A., 1997, Stony Brook University: Hispanic languages and literature.

Number of teaching, graduate, and research assistants, fall 2003: 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 bibliography. 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 at the Graduate School.

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 about this program, please

contact the Department of European Languages.

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 committee 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, 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 chairper-

son 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. Students who enter Stony Brook with a master's degree or equivalent will not ordinarily be considered for a fourth year of support; the graduate committee will grant a fourth year of support only in exceptional cases.

Comprehensive Examination

The student, with the advice of the graduate program director, will normally 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 his or her committee. The total (minimum) number of texts for the exam will be 55 (20 each for parts I and II, and 15 for part III; see below). In their selections for parts I and II, students should strive for balance among genres.

Categories for Comprehensive Exam

I. Peninsular
   a. Medieval
   b. Renaissance and Baroque
   c. Modern
      (18th to 20th century)

II. Latin America
   a. Colonial
   b.19th-Century and
      Modernism
   c. Contemporary

III. Special Field

Possible topics (to be determined by the student) include genre, period, author, feminism, semiotics, film, linguistics, Portuguese, philosophy, history, cultural studies, or a combination of two or more of these or other areas. Interdisciplinary topics should maintain some focus on literature or culture. For information on selection of individual texts for the comprehensive, refer to the departmental graduate student handbook, available upon request.

Five texts, drawn from the departmental reading lists, should be chosen from each subarea in parts I and II, for a total of 30 texts. The student should also choose five critical and theoretical texts for part I and five for part II, for a total of ten texts.

The list corresponding to the special field (part III) will be composed of a minimum of 15 titles to be selected by the student according to his or her interests and should, in any case, include at least five works of criticism and/or theory. No overlap between the texts chosen for part III and the diachronic sections (parts I and II) is permitted.

After consultation with each member of his or her exam committee, the student will submit his or her list to the graduate committee, which will then meet to approve the list or suggest modifications if necessary. This process must be completed three months before the proposed date for the exam.

The oral comprehensive exam will last a total of three hours, with approximately 50 minutes devoted to each area with a brief break at the appropriate point. The exam will be conducted in Spanish or English. In the case of an unsatisfactory performance on one or two of the three sections of the exam, students will be permitted to repeat those sections in an exam of appropriate length within one month of the first attempt. Upon satisfactory completion of all three sections of the exam, the student will be granted ABD status.

The thesis proposal will be presented to each member of the thesis 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 five pages; (2) a table of contents listing proposed chapters; and (3) a detailed bibliography of primary and critical sources.

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 or two 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. 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).
Fall or 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.
Fall or 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.
Prerequisite: Permission of instructor
Fall or 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.).
Fall or 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.
Fall or 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.
Fall or spring, 3 credits, ABCF grading
May be repeated for credit

SPN 509 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.
Fall or spring, 3 credits, ABCF grading

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.
Fall or spring, 3 credits, ABCF grading
May be repeated for credit

SPN 512 Medieval Literature
Major literary works of the medieval period will be read and discussed in depth, and their interrelation with the cultural context analyzed.
Fall or 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.
Fall or 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.
Fall or spring, 3 credits, ABCF grading
May be repeated for credit

SPN 528 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.
Prerequisite: M.A. degree or permission of instructor
Fall or spring, 3 credits, ABCF grading
May be repeated for credit

SPN 541 19th-Century Spanish Literature until the Generation of 1898
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.
Fall or spring, 3 credits, ABCF grading
May be repeated for credit

SPN 543 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.
Fall or spring, 3 credits, ABCF grading
May be repeated for credit

SPN 552 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.
Fall or 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.

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

SPN 569 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.
Fall or spring, 3 credits, ABCF grading
May be repeated for credit

SPN 571 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 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.
Fall or 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.
Fall or 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.
Prerequisite: Permission of graduate program director, M.A. thesis director, or director of the M.A. comprehensive examination committee
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.
Prerequisite: Permissions mentioned above
Fall and spring, 1-6 credits, ABCF grading
May be repeated for credit

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.
Prerequisite: Admission to the Spanish Ph.D. program or permission of instructor
Fall and 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.
Prerequisite: Coursework toward the Ph.D. must be completed; permission of the dissertation director, graduate studies director, or department chairperson
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.
Prerequisite: Permission of instructor, department chairperson, or graduate program director
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 (audiolingual 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.
Prerequisite: Permission of instructor
Fall or spring, 3 credits, ABCF grading

POR 575 Luso-Brazilian Readings
Major literary works from 19th- and 20th-century Portugal and Brazil, especially narratives.
Prerequisite: Reading proficiency in Portuguese and permission of instructor
Fall or 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.
Prerequisites: FLA 505 and FLA 506
Fall or spring, 3 credits, ABCF grading

DLL 571 Foreign Language Technology and Education
Course open to non-D.A. graduate students. Assumes knowledge of material taughtin 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.
Prerequisites: FLA 505 and FLA 506
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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: Iona Man-Cheong, Ward Melville Social and Behavioral Sciences Building N-315 (631) 632-7490/7505
Graduate Program Coordinator: Caroline Accardi, Ward Melville Social and Behavioral Sciences Building S-303 (631) 632-7490

Degrees awarded: M.A. in History; Ph.D. in History

The History department, in the College of Arts and Sciences, consists of 28 full-time faculty and 117 full- and part-time graduate students. Faculty research and teaching cut across the usual demarcations of geography and chronology and cluster around three themes: Women, Gender, and Sexuality in History; Nation, State, and Civil Society; and Empire, Modernity, and Globalization. The department has added a fourth thematic cluster in Environment, Science, and Health. Faculty members have strong ties with faculty and programs in other social sciences, the humanities, the natural sciences, and medicine.

Students may work in traditional areas of historical study, such as American foreign policy, Irish history, 16th- to 20th-century Western European history, Latin American history, and Chinese and Russian history. Students must also choose to study in an area of concentration listed above. Whatever their program of study, students are encouraged to work with professors in the other social sciences, comparative literature, art history, philosophy, women's studies, Africana studies, and the sciences.

The master's program provides students with background in the literature of their chosen fields or topic of interest. The program also introduces them to current theoretical approaches within those fields or topics and the craft of research. Reading workshops supplement the core seminars in these areas. Students write a research paper and schedule a formal conference at the end of two or three semesters of full-time study.

In addition to its regular M.A. degree, the department, in conjunction with the Center for Excellence and Innovation in Education, offers a program leading to a Master of Arts in Teaching (M.A.T.) in Social Studies. Successful completion of the M.A.T. meets the requirements for the New York State provisional certification for teaching social studies in secondary schools. The program includes both history M.A. courses and education courses necessary for certification. The M.A.T. program is administered through the School of Professional Development.

The Ph.D. program is organized to allow students to pursue their areas of interest more intensively. In consultation with their advisors students choose two examination fields. While one field may be traditionally defined geopolitically, both fields may be thematic or comparative provided they are grounded in specific historical contexts.

Full-time students spend about six semesters in seminars and workshops before taking the preliminary examination and advancing to candidacy.

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 and on individual faculty research interests. Interested students should request information and application forms as early as possible, especially if they plan to apply for financial aid.

Admission to the M.A. and Ph.D. Programs

For admission to graduate study in history, the following, in addition to the minimum Graduate School requirements, are required:

A. A bachelor's degree in history or its equivalent.

B. An official transcript of undergraduate record.

C. A minimum grade point average of 2.75 (B-) in all undergraduate coursework and 3.00 (B) in history courses.

D. Letters of recommendation from three previous instructors.

E. Results of the Graduate Record Examination (GRE) General Test.

F. Acceptance by the Department of History and the Graduate School.

In special cases, students not meeting requirements A and C may be admitted on a provisional basis.

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.

Admission to the M.A.T. Program

For admission to the M.A.T. program, students are required to have earned a bachelor's degree with a major in the social sciences (excluding psychology, education, and linguistics), and to have completed at least 18 credits in history. They are expected to have the intellectual skills to do advanced work in history and the temperament and disposition to be an effective teacher. Individuals with secondary certification in social studies are not eligible for the M.A.T.

Applicants should obtain forms from the director of the M.A.T. in Social Studies Program, who is located in the School of Professional Development. The application should include:

A. Official transcripts of undergraduate work;

B. Three letters of recommendation;

C. An official report of Graduate Record Examination (GRE) General Test results.

For more information regarding the M.A.T. in Social Studies, see the SPD section of this bulletin.

Faculty

Professors

Barnhart, Michael[1,2,3,9], 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.

Burner, David, Ph.D., 1965, Columbia University: 20th-century U.S. political 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.

Kuisel, Richard F., *Emeritus.* Ph.D., 1963, University of California, Berkeley: Contemporary Europe; political and economic history; modern France.

Landsman, Ned, *Chairperson.* Ph.D., 1979, University of Pennsylvania: Early American history and Atlantic World; Anglo-American world.

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.[4,9], 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, Ian[8], Ph.D., 1977, University of Wisconsin: Sociology; social history of Latin America; modern Mexico.

Sanderson, Warren, 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[6], *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.

Associate Professors

Cash, Floris B.[5], Ph.D., 1986, Stony Brook University: African-American history; African-American women's studies.

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.

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.

Klubock, Thomas, PhD.,1993, Yale University: Modern Latin America; labor, gender, and environmental history.

Lipton, Sara, Ph.D., 1991, Yale University: Medieval cultural and religious history; Jewish-Christian relations; gender.

Man-Cheong, Iona, *Graduate Director.* 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. enviromental, industrial, and cultural history; history of medicine and the body.

Williams, John A., Ph.D., 1963, University of Wisconsin: British Empire; Africa; the Commonwealth; expansion of Europe.

Wishnia, Judith[6,7], *Emeritus.* Ph.D., 1978, Stony Brook University: Modern Europe; France; labor history; women's history.

Assistant Professors

Cooper, Alix, Ph.D, 1998, Harvard University: Early modern Europe/world; history of science, medicine, and technology; environmental history; cross-cultural encounters.

Lim, Shirley, PhD., 1998, UCLA: Asian-American women's cultural history.

Masten, April, PhD., 1999, Rutgers University: 19th century U.S. cultural history.

Mimura, Janis, Ph.D., 2002, University of California, Berkeley: Japan.

Lecturer

Hinely, Susan, Ph.D, 1987, Stanford University; J.D., 1983, Harvard Law School: European history and women's history.

Number of teaching, graduate, and research assistants, fall 2003: 24

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, Social Sciences Interdisciplinary

7) Joint appointment, Women's Studies

8) Joint appointment, Sociology

9) Distinguished Teaching Professor

Degree Requirements

Requirements for the M.A. Degree

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

A. Advising

M.A. candidates will be assigned an advisor in their anticipated area of study (e.g., U.S., Europe, Latin America). With their advisor, they will define a specific historical field and course of study.

B. Courses

The M.A. curriculum consists of required courses that full-time students can complete in one academic year. The first year of coursework consists of the following:

1. Core Course: History, Theory and Practice. Year-long introductory course introducing students to the conceptual and methodological issues of historical research and writing and to the three themes of the program—Nation, State, and Civil Society; Gender, Sexuality, and Reproduction; Empire, Modernity, and Globalization. For M.A. and Ph.D. students only.

2. HIS 500 Historiography: Introduction to Historiography through reading and writing about interpretations of history, historical methods, and major historians. Term paper on historian choice. Required for M.A. and M.A.T. students only.

3. Two field seminars: Either HIS 501-02, 521-22, or 541-42 that survey the literature and controversies in each of the major fields (U.S., Europe, and Latin America). Ph.D. candidates need only take one field seminar in their geographic area of specialization.

4. Two theme seminars: Provides students with specific comparative issues and methods in topics that relate to the three themes above.

5. Additional 12 courses from Field and Theme seminars and workshops,

chosen in consultation with the student's advisor.

6. HIS 584, 586: Workshop-specialized group readings for M.A. students.

In consultation with their advisor, the student's 30-credit program will be completed with Topical or Workshop seminars that will depend on their field or topic of interest and their research paper.

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 Center for Excellence and Innovation in Education and the School of Professional Development, leads to New York State provisional 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

1. 15 credits in History
   HIS 500 Historiography (3 credits)

   12 credits from the following:
   HIS 521, 522 Seminars-U.S. History (3 or 6 credits)
   HIS 501, 502 Seminars-European History (3 or 6 credits)
   HIS 541, 542 Seminars-Latin American History (3 or 6 credits)
   HIS 562 Introduction to Modern African History (3 credits)
   HIS 563 Field Seminar in South Asian History (3 credits)
   HIS 564 Introduction to East Asian History (3 credits)

2. 15 credits in Professional Study in Education
   CEE 505 Education: Theory and Practice (3 credits)
   CEE 565 Adolescent Growth and Development (3 credits)
   CEE Teaching Social Studies (fall only) (3 credits)
   CEE Social Studies Strategies (spring only) (3 credits)
   CEE Student Teaching Seminar

3. 6 credits in Supervised Student Teaching (CEE)

B. Written Project

Students will also be required to complete a written project in the form of a four-week social studies teaching module specifically designed for the students being taught in the supervised student teaching experience.

Requirements for the Ph.D. Degree

The Ph.D. is the highest professional degree granted by the History Department. Candidates for the degree may hold an M.A. awarded either by Stony Brook University or by another institution it recognizes. 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 an interest. The preparation committee will prescribe the content of the student's program. A foreign language requirement will be set by this committee and will in no case be less than a reading knowledge of one foreign language. The Ph.D. preparation committee will assist the student in defining and mastering two fields of knowledge:

Field 1. A theoretical and/or comparative field. An historical field defined by geography, chronology, and topic drawn from the thematic clusters of the department (i.e., Women, Gender, Sexuality, and Reproduction; Nation, State, and Civil Society; Empire, Modernity, and Globalization; Environment, Science, and Health).

Field 2. An historical field defined by geography, chronology, and subject (e.g., U.S. History since 1865).

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

A. Coursework

The first year of coursework consists of the following:

1. Core Course: History, Theory and Practice. Year-long introductory course introducing students to the conceptual and methodological issues of historical research and writing and to the three themes of the program—Nation, State, and Civil Society; Gender, Sexuality, and Reproduction; Empire, Modernity, and Globalization. For M.A. and Ph.D. students only.

2. Two field seminars. Either HIS 501-02, 521-22, or 541-42 that survey the literature and controversies in each of the major fields (U.S., Europe, and Latin America). Ph.D candidates need only take one field seminar in their geographic area of specialization.

3. One Theme seminar. Provides students with specific comparative issues and methods in topics that relate to the three themes above.

In consultation with their advisor, the student's program in the first year will be completed with Theme or Workshop seminars that will depend on their field or topic of interest and their research paper.

After the first year, the program should be planned in consultation with the student's Ph.D. preparation committee. The remainder of the program must include:

1. HIS 582 Teaching Practicum. An introduction to classroom issue. May be taken as a substitute for HIS 581 for all teaching assistants.

2. Three Research Seminars, two in the second and one in the third year of study.

3. Two more Theme seminars.

4. Thesis Prospective Workshop.

5. Orals Workshop (6 credits).

6. One graduate seminar in a discipline outside the history department.

All students holding full or partial traineeships must register for three credits of HIS 581, Supervised Teaching, in each semester in which they hold such an appointment. Students who have not held a traineeship in the course of their graduate careers must take HIS 582 for at least one semester during their Ph.D. program. Full-time students are expected to take their qualifying (preliminary) examination at the end of their sixth semester.

B. Ph.D.-Level Seminars

There are two types of doctoral (500-600) level seminars. In Research Seminars, students carry out individual, original research projects in areas related to their developing dissertation interests. Theme Seminars explore aspects of the major themes, women, gender, sexuality, and reproduction;

nation, state and civil society; empire, modernization, and globalization. While some seminars may confine themselves to specific geographic regions all Theme seminars will provide students with analytical tools and comparative frameworks with which to pursue individual research. All Ph.D. students are encouraged to take at least one Theme seminar outside their own area of concentration, both thematic and geographic.

C. Dissertation Prospectus Workshop

All Ph.D. students will be required to take the dissertation prospectus workshop (HIS 695) in order to help them prepare their dissertation prospectuses. This prospectus should contain an explanation of the research problem under investigation, a summary of the relevant secondary literature, a statement of hypothesis, and an outline of both the research sources and the methods that the student expects to employ. The prospectus must be acceptable to both the instructor of the thesis workshop and the student's Ph.D. committee. The workshop should be completed either before or in the same semester as the qualifying (preliminary) examination. Completion of the workshop and the dissertation prospectus are required for advancement to candidacy.

D. Qualifying (Preliminary) Examination

The Ph.D. examination will be an oral examination covering both the dissertation and comparative fields, each given equal emphasis. The examining committee will take into consideration the student's overall graduate record before recommending advancement to candidacy.

E. Foreign Languages

Proficiency in at least one foreign language must be demonstrated before a student may be advanced to Ph.D. candidacy. The student and his or her Ph.D. committee will decide which language or languages are most suitable, with the approval of the graduate committee.

F. Supervised Teaching

Teaching assistants in the History Department are expected to perform either research or teaching functions in the department, up to a maximum of 20 hours a week.

Those who are teaching assistants will enroll in HIS 581, Supervised Teaching, for three credits per semester. Their work will be supervised by the member of the faculty to whom they are assigned.

All doctoral students beyond the M.A. level, whether teaching assistants or not, are expected to perform some kind of supervised teaching during their graduate careers.

G. Advancement to Candidacy

After the student has passed the qualifying examination, the department shall propose to the dean of the Graduate School that the student be advanced to Ph.D. candidacy.

H. Dissertation

A dissertation is required for the Ph.D. degree. All students will be required to complete a preliminary dissertation prospectus before taking their qualifying examination.

After advancement to candidacy, a student will register for dissertation credits in consultation with the advisor. The student will select a dissertation topic within the major field. At present, the department offers dissertation fields in United States, modern European and Latin American history, and the expansion of Europe.

Upon completion, the dissertation must be approved by a dissertation examining committee of at least four members of the faculty, appointed by the dean of the Graduate School. This committee must include the dissertation supervisor and at least one person from outside the department.

Before final approval can be granted, the student must present the results of the dissertation research at an informal dissertation colloquium convened for that purpose by the department and open to interested faculty members and graduate students.

For further details, see the appropriate section of the Graduate School regulations.

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

HIS 517 Theme Seminars on Empire, Modernity, and Globalization

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.
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 writ-

ing 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.
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 4 times for credit

HIS 535 Theme Seminars on Gender, Sexuality, and Reproduction

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 HIS 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.
Prerequisite: Enrollment in a graduate history program
3 credits, ABCF grading

HIS 543 Theme Seminars on Gender, Sexuality, and Reproduction

HIS 552 Theme Seminar: Mass Media and Journalism in International Perspectives

HIS 553 Theme Seminars on Nation, State, and Civil Society

HIS 554 Theme Seminars on Nation, State, and Civil Society

HIS 555 Theme Seminars on Nation, State, and Civil Society

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.
3 credits, ABCF grading
May be repeated for credit

HIS 562 Introduction to Modern African History
Field seminar in modern African history. Surveys major topics such as nationalism, anticolonial movements, and modernization. Note: MAT and MA/LS students must register under CEG 534; crosslisted with HIS 562
Prerequisite: Enrollment in a graduate history program
3 credits, ABCF grading
May be repeated once 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 MA, MAT, PhD 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 postwar reconstruction. For M.A., M.A.T., Ph.D. students.
3 credits, ABCF grading

HIS 570 Theme Seminars in Environment, Science, and Health
Spring

HIS 571 Theme Seminars in Environment, Science, and Health
Spring

HIS 572 Theme Seminars in Environment, Science, and Health
Spring

HIS 581 Supervised Teaching
Teaching practicum that usually accompanies a student's assistantship.
3 credits, S/U grading

HIS 582 Teaching Practicum
Practicum in teaching methods for new assistants. (M.A. Workshop required deleted from the curriculum)
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
Fall or spring, 3 credits, ABCF grading

HIS 601 Research Seminars on Social and Cultural History

HIS 603 Research Seminar on Social and Cultural History

HIS 615 Research Seminars on Empire, Modernity, and Globalization

HIS 616 Research Seminars on Social and Cultural History

HIS 617 Research Seminars on Empire, Modernity, and Globalization
Prerequisite: Enrollment in a graduate history program

HIS 622 Migration, Diaspora, and Transnationalism

HIS 623 Research Seminars on Ethnicity and Migration

HIS 631 Research Seminar: The Social History of Medicine and Health

HIS 632 Research Seminars on Gender and Sexuality

HIS 633 Research Seminars on Gender and Sexuality

HIS 634 Research Seminars on Gender and Sexuality

HIS 652 Research Seminar: Oral History: Methodology and Theory

HIS 653 Research Seminars on Nation, State, and Civil Society

HIS 654 Research Seminars on Nation, State, and Civil Society

HIS 655 Research Seminars on Nation, State, and Civil Society

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

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

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

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

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: Christina Y. Bethin, Ward Melville Social and Behavioral Sciences Building N-257 (631) 632-7370
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 offers sophisticated instruction in theoretical linguistics and extensive training in the area of teaching English to nonnative 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, Praat, and XWaves. Synthesis platforms supported are Deltatools and HLSy. PC and Mac computers are used for teaching and research. There is also a computer lab with Internet access for graduate student use.

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 nonrefundable application fee of $50 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 syntax; morphology; languages of the Caucasus.

Hoberman, Robert, Ph.D., 1983, University of Chicago: Semitic linguistics.

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.

Number of teaching, graduate, and research assistants, fall 2003: 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

1. 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

2. 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
3. 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.

1. 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 (referred to as 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 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.
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

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 or spring, 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 and 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, 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 and LIN 524.
Co-requisite: LIN 578 (LIN 579 with permission from 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 nonlinear 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 or spring, 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

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.
Prerequisite: Advanced standing
Fall and 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, 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.

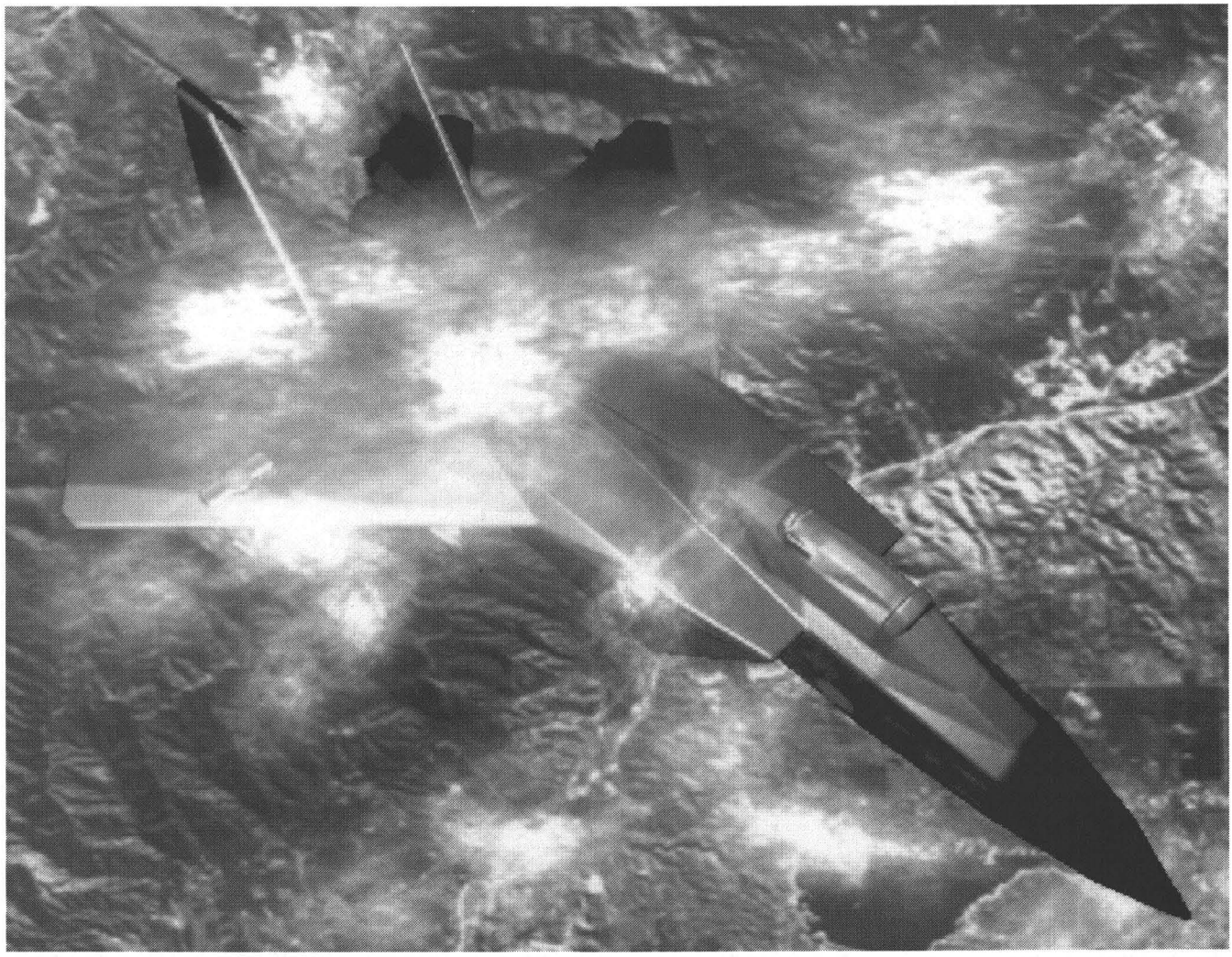
ESL 591 Intermediate Oral/Aural Skills Class
The purpose of this course is to do intensive

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



This computer-generated image—a realistic flight simulation built by graduate students under U.S. Navy and Hughes Aircraft grants—depicts an F-15 (Eagle) flying through clouds over terrain textured with satellite imagery.

W. Averell Harriman School for Management and Policy (MGT)

Director: Thomas R. Sexton, Harriman Hall 102 (631) 632-7296
Graduate Program Director: Jeff T. Casey, Harriman Hall 102 (631) 632-7296
Director of the Center for Human Resource Management: Manuel London, Harriman Hall 102 (631) 632-7159
Office of Student Services: Maria Moore, Patrice Virgilio, Michele Smorra Harriman Hall 102 (631) 632-7296 or (631) 632-7171

Advanced Graduate Certificates awarded: Advanced Graduate Certificate in Health Care Management; Advanced Graduate Certificate in Information Systems Management; Advanced Graduate Certificate in Human Resources Management
Degree awarded: M.S. in Management and Policy; M.S. in Technology Management

Three major forces have changed the practice of management over recent decades. First, applied behavioral science research produced the knowledge required to develop entrepreneurial managers. Second, the information revolution created the ability to process large amounts of complex information quickly. Third, analytical techniques were developed to support decision makers. These three factors can transform organizations from burdensome bureaucracies into productive, enlightened, and humane workplaces.

The Harriman School graduate programs are springboards for exciting management careers in business, government, and nonprofit organizations. The programs focus on both the management of technology and the "people" aspects of enterprises. Technological considerations and computers and other information systems technology arise in many courses.

Harriman School graduates enjoy a wide array of excellent career opportunities. Programs prepare students for positions in business, government, and nonprofit organizations, and emphasize essential links among these sectors. Thus, graduates are ready to pursue careers in all three fields. The University's own placement office, together with the entire faculty, develops opportunities for graduates to move forward in successful careers.

Managerial courses focus on marketing, operations, accounting, finance, management information systems, and strategy. Model building, data analysis, organizational behavior, ethics, and economics apply and integrate techniques of analysis to solve management and policy problems using texts and actual cases.

The curriculum is only part of a successful program. The Harriman program gives its students personal attention through the Harriman Mentor Program and individualized internship advisement. The program draws on faculty and resources from across the University, including the Center for Human Resource Management, the Health Services Research and Management Unit, and the Small Business Development Center, thus creating interdisciplinary excitement. Renovated facilities provide a setting for studying, socializing, computing, learning, and discussing.

The Harriman Alumni Association, which currently numbers 500 graduates, helps management placement officers foster careers and promote job opportunities and placements in the private, public, and nonprofit sectors.

M.S. Programs

Two-Year Program

The 60-hour, Two-Year Program has elective specializations in health care management, human resource management, and information systems management, plus additional elective courses in finance, marketing, and entrepreneurship. Students are not obligated to choose an elective specialization and can select the elective courses that best suit their career objectives.

The program emphasizes technology management in two ways. First, technological considerations are apparent in most courses. Students become particularly conversant with computers and other information systems technology. Second, elective specializations are available in diverse technology management areas, including information systems, and health care management.

The core courses in the Two-Year Program include courses dedicated to (1) managerial functions such as accounting, finance, human resources, information systems, marketing, and operations; (2) basic topics such as economics, decision models, statistics; and (3) integrative topics such as ethics and strategy. This program is available on a full-time or part-time basis.

Advanced Credit Program

The Advanced Credit Program is designed to supplement previous graduate education with training in management and policy analysis. Students with a graduate degree in another field may apply to the Advanced Credit Program. Recent students include those who have earned M.D.s and Ph.D.s in a wide variety of disciplines.

The program consists of ten courses, comprising at least 30 credits, and an internship. Thus, a full-time student will normally complete the coursework in one year, perform the required internship the following summer, and then write an internship report.

Because of the scope of academic backgrounds students bring to the Advanced Credit Program and the limited number of courses required in the program, each student designs his or her own academic program in consultation with an advisor and the Harriman School's graduate program director. The program is available on a full-time or part-time basis.

Internship

Students in the Two-Year and Advanced Credit programs perform a paid internship and write an internship report. Full-time students usually complete their internships during the summer between the first and second years. The school assists its students in securing internships. Working/part-time students may satisfy their internship requirements in the context of their current employment. Alternative arrangements may be possible for students with extensive work experience. Advanced credit students may complete the internship after they have finished their ten courses.

Certificate Programs

The Advanced Graduate Certificate programs described below are open to graduate students enrolled in Harriman programs or other graduate majors at Stony Brook. In addition, these programs are open to non-matriculated students who wish to earn an Advanced Graduate Certificate without completing a full master's 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 Resources Management, requires a bachelor's degree from an accredited college. The School of Professional Development administers this program.

For Graduate Students of All Majors

Full or part-time students enrolled in a master's degree program at Stony Brook who complete a six-course, 18-credit program will receive the New York State Advanced Graduate Certificate in Human Resources Management. The program must be completed in three years.

For Human Resource Management and Information Systems Management Certificate Program Students—Part Time

Certificate program students who are not in a master's degree program at Stony Brook are required to complete a seven-course, 21-credit program over a three-year period. Students who meet the master's degree admissions requirements of the Harriman School or the School of Professional Development may also apply the certificate credits toward either a Harriman or School of Professional Development master's degree. Students must declare their decision to matriculate into a master's program after the completion of no more than 12 credits.

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 W. Averell Harriman School for Management and Policy.

The curriculum consists of 18 credits, from the School of Health Technology and Management and the Harriman School. At least four of the courses must have a health care focus. Admission requirements for the program are (1) a B.A. or B.S. degree in any undergraduate major and (2) an undergraduate grade point average of 2.8 or higher. The certificate will be jointly awarded by the School of Health Technology and Management and the W. Averell Harriman School of Management and Policy to any student who attains a grade point average of 3.0 or higher in the certificate program.

The program is designed to meet the needs of (1) working professionals who are part-time students and (2) full-time graduate students at the University. Many courses are often 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 Master of Science in Management in the W. Averell Harriman School may obtain the certificate as they earn credits toward graduation.

Certificate Program in Information Systems Management

The Advanced Graduate Certificate Program in Information Systems Management (ISM) is a graduate professional development program which 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.

The curriculum consists of 18 credits. Admission requirements are (1) a B.A. or B.S. degree in any undergraduate major and (2) an undergraduate grade point average of 2.8 or higher. Students who do not meet requirement 2 may be eligible for provisional admission. The New York State Advanced Certificate in Information Systems Management is awarded to the students who complete the certificate program. Graduate students who pursue the Masters of Science in Management in the W. Averell Harriman School may obtain the certificate as they earn credits toward graduation. This program is administered by the School of Professional Development.

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.

* This certificate is currently pending approval.

Research

Faculty members of the Harriman School 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, Harriman professors examine complex issues and problems confronting today's managers and decision makers in high-technology businesses, nonprofit organizations, and government agencies. 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 Harriman School 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. Harriman 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 Harriman School academic programs. Additionally, 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 Harriman School computing facility contains 20 networked Windows NT personal computers and a high-speed laser printer. The computers have high-speed connections to the outside world. Each computer has full Internet access to e-mail, Internet utilities, and Web servers. Each 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 on-line library catalog. Students may access their own administrative records on-line, check course schedules for upcoming semesters, and view calendars for campus events. John Milazzo directs computing services at the Harriman School.

Admission to the M.S. Programs

The Harriman School 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 W. Averell Harriman School and the Graduate School;

F. $50 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 in both the fall and spring semesters. Applications for the fall semester should be submitted by March 1 for applicants seeking financial aid and by April 15 for those not seeking aid. Earlier submissions are encouraged, especially for candidates for university-wide fellowships. Applications are reviewed between January and April for the following fall semester. Decisions concerning financial aid will be made not later than April 1. Applications must be submitted by November 1 for spring admission. Late applications are accepted if there are places available.

Application forms may be obtained by writing to:

Office of Student Services
Harriman Hall, Room 102
W. Averell Harriman School for Management and Policy
Stony Brook University
Stony Brook, New York 11794-3775
(631) 632-7296
E-mail: *oss@notes.cc.sunysb.edu*

Faculty

Professors

London, Manuel[1], *Director of the Center for Human Resource Management.* Ph.D., 1974, Ohio State University: Personnel promotion policies; management training; organizational behavior.

Sexton, Thomas R.[2], *Director of the Harriman School; Codirector of Health Services Research and Management Unit.* Ph.D., 1979, Stony Brook University: Health care delivery systems; efficiency analysis; statistics.

Skorin-Kapov, Jadranka[2], Ph.D., 1987, University of British Columbia, Canada: Management information systems; operations research; artificial intelligence.

Wolf, Gerrit[1], Ph.D., 1967, Cornell University: Entrepreneurship; organizational behavior; human resources management; international management.

Associate Professors

Carroll, T. Owen[3], Ph.D., 1968, Cornell University: Nonlinear dynamics in finance; management information systems; pattern recognition with applications to finance.

Casey, Jeff T.[4], *Graduate Program Director.* Ph.D., 1986, University of Wisconsin: Human resource management; managerial judgment and decision making, negotiation and conflict resolution.

Lecturers

Allocca, Carl J., C.P.A., M.B.A., Long Island University, C.W. Post: Public and private accounting; auditing; taxation; and internal systems development and review.

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.

Lewis, Herbert F., Ph.D., 1996, Stony Brook University: Management science; operations management; management information systems.

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, J.D., Hofstra University School of Law; M.B.A., Adelphi University: Banking; finance; law; general management.

Adjunct Faculty

Azzato, Lisa, J.D., Human Resource Management.

Badr, Hussein, Ph.D., Operations Research/Management Science.

Brown, Tom, M.B.A., Accounting.

Cerbone, Frank, M.A., Information Systems Management.

Chodkowski, Matthew, Ed.D., Human Resource Management.

Farmer, Carol, C.P.A., Accounting.

Gomes, Lyle, M.B.A., C.M.A., Human Resource Management.

Heaton, William, M.B.A., Entrepreneurship.

Jelen, Jonatan, Ph.D., Information Systems Management.

Kerr, Brian, M.P.S., Industrial and Labor Relations.

Lekacos, Arthur, M.S., Information Systems Management.

Liggan, William, M.P.S., Human Resource Management.

Marlow, Frank, Ed.D., Human Resource Management.

McDonnell, Ph.D., Entrepreneurship.

McMullan, Christine, M.P.A., Human Resource Management.

Menton, Arthur, M.M.E., Marketing.

Merrill, Linda J., M.A., Human Resource Management.

Mone, Edward, M.A., Human Resource Management.

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; Corporate Finance.

Rotchford, John, M.B.A., Information Systems Management.

Schiller, Herbert, M.S., Operations Management.

Schiavone, Vincent, M.B.A., M.P.S., Human Resource Management.

Shak, Arnold, M.S., Information Systems Management.

Weiner, Harry, M.S., Ethics; Comparative and International Management.

Yildirim, Emre, Ph.D., Operations Research/Management Science.

1) Joint appointment, Department of Psychology

2) Joint appointment, Department of Applied Mathematics and Statistics

3) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1974

4) Joint appointment, Department of Political Science

Degree Requirements

The Harriman curriculum prepares students for careers in management in business, government, and nonprofit organizations. The Harriman School Master of Science in Management and Policy 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 should consult the Harriman School Viewbook for details regarding all aspects of the curriculum.

Two-Year Program

Fall–First Year (14 credits)

MGT 515 Data Analysis (4 credits)

MGT 533 Managerial Economics (3 credits)

MGT 535 Accounting (3 credits)

MGT 571 Marketing and Marketing Research (4 credits)

Spring–First Year (16 credits)

MGT 512 Comparative and International Management (4 credits)

MGT 517 Management Information Systems (3 credits)

MGT 532 Finance (3 credits)

MGT 543 Modeling (3 credits)

MGT 589 Operations Management (3 credits)

Internship

Fall–Second Year (15 credits)

MGT 541 Group Project (6 credits)

MGT 592 Organizational Behavior (3 credits)

Elective

Elective

Spring–Second Year (15 credits)

MGT 520 Ethics in Management (2 credits)

MGT 580 Strategy (4 credits)

Elective

Elective

Elective

Internship Requirement

The Harriman School's internship program provides the student with important practical training in management and policy analysis. 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 MGT 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 graduate students in the Harriman School 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 Harriman 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 caeer planning process. Materials include information on occupations, labor market trends, salary levels, job hunting, resume writing, employment interviewing, and many other areas. Those Harriman graduate 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. The Center's Web page is *www.sunysb.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 which 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 which 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.

Fall (First Year)

MGT 515 Statistics for Managers
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.
4 credits, ABCF grading

MGT 533 Managerial Economics
The techniques and approaches of microeconomic 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

MGT 535 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

MGT 571 Marketing and Marketing Research
The philosophy of marketing, developing marketing strategy (including segmentation and positioning), planning marketing tactics (product, pricing, integrated communications, and sales and distribution strategy). Marketing research methodology and its implementation are introduced. This treatment will be largely from an applied perspective with emphasis on improving managerial decision making processes in marketing.
4 credits, ABCF grading

Fall (Second Year)

MGT 541 Group 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 an 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, 6 credits, ABCF grading

MGT 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.
3 credits, ABCF grading

2 Elective Classes

Spring (First Year)

MGT 512 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, 4 credits, ABCF grading

MGT 517 Info Systems for Management
Information systems and their role in strategic planning and managerial operations in business. The systems approach to the analysis, design, and implementation of information systems. Recent developments in infor-

mation technology, and their impact on existing and future information systems.
3 credits, ABCF grading

MGT 532 Finance
How firms meet and manage their financial 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 relating to capital, are explained. Bond and stock valuations are introduced.
3 credits, ABCF grading

MGT 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

MGT 589 Production and 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 MGT 589 and EMP 506.
Prerequisite: MGT 515
Spring, 3 credits, ABCF grading

Spring (Second Year)

MGT 520 Ethics in Management
This course aims at enabling students preparing for careers in management to bring to bear on problems of organizational life those ethical principles they have already adopted based upon religious, secular, and personal experience. Starting with relatively simple problems (bribery), the course progresses to more complex and ambiguous situations (government-operated lotteries, corporate greed). Practice is given in orally defending ethical opinions.
Spring, 3 credits, ABCF grading

MGT 580 Strategy
This principles and techniques of strategic management by which an organization sets and implements its long-range direction. This includes the processes of environmental 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.
3 credits, ABCF grading

3 Elective Classes

Electives

MGT 503 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 CEX 547.
3 credits, ABCF grading
May be repeated for credit

MGT 504 New Developments in Human Resource Administration
This is an advanced course, designed to communicate new professional concerns and developments to students who have acquired a grasp of the basics. The course will focus on such topics as Japanese methods of increasing productivity and their adaptation by American firms; developing union/management cooperation; affirmative action recruitment; impact of the computer revolution on the human resource field; specialized needs and problems of high tech firms; major challenge of innovative job finding and training programs for workers left jobless in the smokestack industries. This course is offered as both CES 513 and MGT 504.
3 credits, ABCF grading

MGT 505 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 MGT 505.
3 credits, ABCF grading

MGT 506 A Survey of Labor 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 MGT 506.
3 credits, ABCF grading

MGT 507 Contemporary Issues in Labor 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 MGT 507.
3 credits, ABCF grading

MGT 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. The role of tax laws and government programs in inhibiting migration and assisting labor/community buyouts; the new American dedication to sustaining industrial competitiveness.
Spring, 3 credits, ABCF grading

MGT 509 Continuos Quality Improvement
This course provides students with the ability to understand basic principles associated with Total Quality Managment (TQM) and Continuos Quality Improvement (CQI). It will also help students identify and solve quality problems found in all types of organizations, utilizing CQI tools and techniques. Through the use of case studies, current events and textbook materials, students will learn how to identify process problems, recommend improvements and collect data to demonstrate process improvement. An emphasis will be placed on the improvement of human resources processes.
Fall and spring, 3 credits, ABCF grading

MGT 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 MGT 510.
Prerequisite: CES 515/MGT 505
3 credits, ABCF grading

MGT 511 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 MGT 511.
3 credits, ABCF grading

MGT 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 MGT 514.
Prerequisites: MGT 506 or CES 516
3 credits, ABCF grading

MGT 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 MGT 519.
3 credits, ABCF grading

MGT 521 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

MGT 523 Human Resource Management in the Individual Firm or Organization

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

MGT 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 MGT 524 and CES 524.
Prerequisite: MGT 506 or CES 516
3 credits, ABCF grading

MGT 525 Labor Relations Law

This course will explore the legal interrelationships in selected areas among employers, employees, unions, and government. Topics will include the evolution of labor 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: MGT 506 or CES 516
3 credits, ABCF grading

MGT 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 MGT 526.
3 credits, ABCF grading

MGT 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 MGT 527.
3 credits, ABCF grading

MGT 529 Managerial Accounting and Decision Making

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.
3 credits, ABCF grading

MGT 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 aquisitions.
Prerequisite: MGT 532.
Fall, 3 credits, ABCF grading

MGT 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. Also, 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 MGT 537 and CEX 537.
3 credits, ABCF grading

MGT 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 MGT 538.
Prerequisite: MGT 505/CES 515
3 credits, ABCF grading

MGT 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.
3 credits, ABCF grading

MGT 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 MGT 540 and AMS 540.
Prerequisite: Linear algebra course
3 credits, ABCF grading

MGT 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 MGT 544 and AMS 544.
Prerequisite: AMS 540 or MGT 540
Spring, 3 credits, ABCF grading

MGT 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: MGT 532.
Fall, 3 credits, ABCF grading

MGT 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 MGT 546 and AMS 546.
Prerequisite: AMS 540 or permission of instructor
Spring, even years, 3 credits, ABCF grading

MGT 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 MGT 550 and AMS 550.
Prerequisite: AMS 507 or equivalent
3 credits, ABCF grading

MGT 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: MGT 532 and MGT 535
3 credits, ABCF grading

MGT 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 MGT 553.
Prerequisite: CSE 214 or equivalent; AMS 310 or 507 or equivalent; or permission of instructor
3 credits, ABCF grading

MGT 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 MGT 554 and AMS 554.
Prerequisite: AMS 507
Fall, even years, 3 credits, ABCF grading

MGT 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 MGT 556 and AMS 556.
Prerequisite: MGT/AMS 550 or MGT/AMS 558
3 credits, ABCF grading

MGT 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 MGT 558 and AMS 558.
Prerequisites: AMS 504; AMS 507 or equivalent
Spring, 3 credits, ABCF grading

MGT 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

MGT 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, date 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.
3 credits, ABCF grading

MGT 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

MGT 562 Telecommunication Networks
The theory of telecommunication networks and their management applications. The course includes the following topics: basic principles of telecommunications, telecommunication network design, organizations involved in telecommunications, business applications, switching systems, voice messaging systems, local area networks, wide area networks, internetworking basics, principles of data communications, protocols, broadband networks, wireless communications, multimedia technology, the internet and electronic commerce, convergence topics (voice over IP).
Fall, 3 credits, ABCF grading

MGT 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

MGT 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 MGT 569.
Prerequisite: AMS 504 or equivalent
3 credits, ABCF grading

MGT 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

MGT 572 Business Plan Project I
Students will team with a group from Mechanical 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. Results of this course will become the basis for MGT 573 in the Spring semester. Students must also complete MGT 573 in order to receive credit for MGT 572.
Prerequisite: G2 standing with GPA of 3.0 or higher
Fall, 3 credits, ABCF grading

MGT 573 Business Plan Project II
This is a continuation of MGT 572. Building on the marketing plan developed in MGT 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. The 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: Successful completion of MGT 572
Spring, 3 credits, ABCF grading

MGT 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.
Prerequisites: MGT 517, MGT 571, MGT580
Spring, 3 credits, ABCF grading

MGT 587 Decision Support Systems
An advanced course focusing on the interrelationships among management information systems, statistics and management science. Both model-driven and date-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.
3 credits, ABCF grading

MGT 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 susbequent analysis.
3 credits, ABCF grading

MGT 591 Special Topics in Policy Analysis and Public Management
This course provides students with the ability to understand basic principles associated with Total Quality Management (TQM) and Continuous Quality Improvement (CQI). It will also aid students to identify and solve quality problems found in all types of organizations, utilizing CQI tools and techniques. Through the use of case studies, current events, and textbook materials, students will learn how to identify process problems, recommend improvements, and collect data to demonstrate process improvement. An emphasis will be placed on the improvement of human resources processes. This course is offered as both CEX 539 and MGT 591. Note: This course is not applicable to the Advanced Graduate Certificate in Human Resources Management.
3 credits, ABCF grading
May be repeated six times for credit

MGT 595 Individual Directed Research in Management and Policy
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

MGT 599 Internship Practicum
Designed to accommodate Management and Policy graduate students working on their internship project requirement while under supervision of an advisor.
Fall, spring, and summer, 0-1 credits, S/U grading

MGT 800 Summer Research
May be repeated for credit

Marine Sciences Research Center (MAS)

Dean: David O. Conover, Endeavour Hall 145 (631) 632-8700
Graduate Program Director: Robert Armstrong, Dana Hall 107A (631) 632-3088
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: Nancy Glover, Endeavour Hall 105 (631) 632-8681

Degrees awarded: Graduate Certificate in Oceanic Science; Graduate Certificate in Waste Management; M.S. in Marine and Atmospheric Science; 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 coastal oceanography and marine environmental sciences. 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 an M.S. degree in Marine Environmental Sciences and a Ph.D. in Coastal Oceanography with concentrations in both oceanography and atmospheric sciences. Following are detailed descriptions 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. In addition, MASIC operates its own local area network supporting CD-Rom based databases that are appropriate to the varied studies at MSRC.

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 a new 24-meter research vessel designed specifically for oceanographic research. It is outfitted for virtually every kind of oceanographic sampling. MSRC also maintains a fleet of smaller boats.

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 coastal 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 whether in the atmospheric sciences or in the biological, chemical, geological, physical, or management aspects of the coastal zone, 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 Ocean. Plankton biology, adaptation of benthic organisms, and biofilms are just some of the foci of our faculty. Contaminant cycling and biological impacts are other 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 Environmental 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 must have an M.S. degree or have published an acceptable article in a scientific journal. Students may be admitted to the program upon completion of the University's M.S. degree in Marine Environmental Sciences or by transfer from other institutions. The requirement of an M.S. degree may be waived for students who have demonstrated exceptional scholarship and motivation, and who have a clear sense of direction. 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.

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

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.

Fox, Jane, Ph.D., 1978, Harvard University: Planetary aeronomy.

Geller, Marvin A., *Director of the Marine Sciences Research Center.* Ph.D., 1969, Massachusetts Institute of Technology: Atmospherics dynamics; climate and the upper atmosphere.

Hameed, Sultan, *Coordinator of Atmospheric Sciences Program.* Ph.D., 1968, University of Manchester, England: Atmospheric sciences.

Herman, Herbert, Ph.D., 1961, Northeastern University: Ocean engineering; undersea vehicles; marine materials.

Koppelman, Lee E., *Director of the Center for Regional Policy Studies, and Executive Director of the Long Island Regional Planning Board.* Ph.D., 1970, Cornell University: Coastal zone management; planning; policy studies.

Lopez, Glenn R., *Graduate Program Director.* Ph.D., 1976, Stony Brook University: Benthic ecology; animal-sediment interactions.

Meyers, William J. *Emeritus.* Ph.D., 1973, Rice University: Carbonates; sedimentology.

Schubel, J.R., *Emeritus.* Ph.D., 1968, Johns Hopkins University: Coastal sedimentation; suspended sediment transport; coastal zone management.

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.

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.

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.

Zhang, Minghua, Ph.D., 1987, Institute for Atmospheric Physics, Academia Sinica, Beijing: Atmospheric sciences; modeling of climate.

Associate Professors

Aller, Josephine Y., Ph.D., 1975, University of Southern California: Marine benthic ecology; invertebrate zoology; marine microbiology; biogeochemistry.

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.

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., North 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 Institute: Aquatic toxicity, fate and effects of organic contaminants.

Reaven, Sheldon, Ph.D., 1975, University of California, Berkeley: Energy and environmental problems; waste management; technology assessment; science and society.

Sanudo-Wilhelmy, Sergio A., Ph.D., 1993, University of California, Santa Cruz: Chemical oceanography; coastal geochemistry; metal cycling in aquatic systems.

Taylor, Gordon T., Ph.D., 1983, University of Southern California; Marine microbial ecology; microbial mediation of biogeochemical processes; biofouling.

Waliser, Duane E., Ph.D., 1992, University of California, San Diego: Observational theoretical studies of ocean-atmosphere coupling in the tropics.

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.

Colle, Brian A., Ph.D., 1997, University of Washington: Synoptic meteorology; mesoscale numerical modeling and forecasting; coastal meteorology.

Collier, Jackie L., Ph.D., 1994, Stanford University: Phytoplankton physiology and ecology; freshwater and marine plankton; molecular microbial ecology.

Goodbred, Steven L., Jr., Ph.D., 1999, College of William and Mary: Coastal and subaerial margin systems; development and sedimentary processes.

Lecturers

Greenfield, Dianne, Ph.D., 2002, Stony Brook University: Phytoplankton ecology with special interest in harmful algal blooms.

Heidelberger, Edwin C.[5], M.S., 1969, New York University: Meteorology; weather prediction.

Roethel, Frank J., Ph.D., 1982, Stony Brook University: Environmental chemistry; behavior of coal waste in the environment; solution chemistry.

Adjunct Faculty

Andreoli, Aldo, M.C.E., 1962 New York University: Water pollution control; water supply; subsurface denitrification.

Berger, Harold, L.L.B., 1964, J.D., 1968, St. John's University: Solid waste disposal; groundwater quantity and quality; air emissions; wetland formation and protection.

Breslin, Vincent T., Ph.D., 1986, Florida Institute of Technology: Environmental chemistry; contaminant transport and leachability; waste treatment technologies.

Carpenter, Edward J., Ph.D., 1969, North Carolina State University: Nitrogen cycling among plankton and ambient seawater; phyto- and zooplankton ecology; effects of toxic chemicals and electric power stations on coastal plankton.

Chistoserdov, Andre Y., Ph.D., 1985, Institute of Genetics and Selection of Industrial Microorganisms, Russia: Marine microbiology; C1 compounds cycling; molecular genetics of methylotrophic bacteria; marine biotechnology and bioremediation.

De Zafra, Robert, Ph.D., 1958, University of Maryland: Positron annihilation.

Dove, Alistair, Ph.D., 1999, University of Queensland: Pathology; taxonomy; life cycles/ecology.

Herman, Herbert, Ph.D., 1961, Northwestern University: Surface engineering.

Kuznetsova, Marina R., Ph.D., 1993, Moscow State University: Physico-mathematical with specialization in geophysics.

Miller, Mark A., Ph.D., 1994, Pennsylvania State University: Meteorology; surface-based remote sensing; marine boundary layer clouds.

Padilla, Diana, Ph.D., 1987, University of Alberta, Canada: Marine function ecology; invasion biology.

Safina, Carl, Ph.D., 1997, Rutgers University: Marine conservation.

Shumway, Sandra, Ph.D., D.Sc., 1976, University of Wales, England: Physiological ecology of marine invertebrates; shellfish biology; toxic algae.

Swanson, R. Lawrence, *Director of Waste Management Program.* Ph.D., 1971, Oregon State University: Physical oceanography of coastal waters and estuaries; ocean dumping; coastal zone management.

Suszkowski, Dennis, Ph.D., 1978, University of Delaware: Estuarine sedimentology; ocean and estuarine policy and management.

Zhou, Xuelong, Ph.D., 2000, Stony Brook University: Acid deposition; long-range weather forecasting; tropical cold point tropopause and stratospheric water vapor.

Research Faculty

Woodhead, Peter M.J., *Professor.* B.S., 1953, Durham University, England: Behavior and physiology of fish; coral reef ecology; ocean energy-conversion systems.

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. MAR 547 Oceanographic Problem Solving. All students must pass one semester of MAR 547. A maximum of two credits of MAR 547 can be counted toward the Graduate School's 30-credit requirement for the M.S. degree;

C. Seminar MAR 580 (two semesters);

D. An advisor by the end of the first year (for students in the Oceanography concentration);

E. Master's research proposal due by end of first year, signed by advisor and two readers;

F. 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;

G. Sea experience or appropriate field experience;

H. Oral presentation of thesis work;

I. 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.
Co-requisite: MAR 555 or permission of instructor
Fall, 4 credits, ABCF grading

MAR 502 Biological Oceanography
A broad treatment of energy and nutrient cycling in coastal and open ocean environments. Introduction to organisms and habitats. Includes a student lab project to develop research skills.
Prerequisite: Enrollment in Marine Environmental Sciences program or permission of instructor
Fall, 4 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.
Prerequisite: Enrollment in the Marine Environmental Sciences program or permission of instructor
Spring, 4 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.
Prerequisite: Enrollment in Marine Environmental Sciences program or permission of instructor
Spring, 4 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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
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.
Prerequisites: Permission of instructor
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.
Prerequisites: MAR 502, MAR 503
Fall, 3 credits, ABCF grading

MAR 513 Coastal Models

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.
Prerequisite: Permission of instructor
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.
Prerequisites: General biology
Spring, 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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
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.
Prerequisite: MAR 503 or permission of instructor
Fall, 1 credit, ABCF grading

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.
Pre- or co-requisites: MAR 502, 503
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.
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.
Spring, alternate years, 3 credits, ABCF grading

MAR 523 Molecular Biological Method 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.
Prerequisite: GEO 526 or MAR 503 or permission of instructor
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.
Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading

MAR 526 Pollutant Responses

MAR 529 Isotope Geochemistry

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.
Prerequisite: Permission of instructor
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 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.
Prerequisites: Permission of instructor
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.
Prerequisite: Undergraduate courses in biology, particularly ecology, invertebrate zoology, and/or physiology
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).
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 include photosynthesis and growth, nutrients, temporal and spatial variability, competition, and predation. Students carry out original research projects.
Fall, 3 credits, ABCF grading

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.
Prerequisites: Introductory biology and general chemistry
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.
Prerequisite: MAR 502 or permission of instructor
Fall, 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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
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.
Prerequisites: MAR 501, MAR 502
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.
Prerequisite: Permission of instructor
Spring, 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, 1-2 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.

Prereqisite: Permission of instructor
Fall, 2 credits, ABCF grading

MAR 552 Directed Study
Individual studies under the guidance of a faculty member. Subject matter varies according to the needs of the students.
Prerequisite: Permission of instructor
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.
Prerequisite: Calculus I or permission of instructor
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

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.
Prerequisite: Calculus I or permission of instructor
Fall, 2 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.
Prerequisite: Permission of instructor
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 both CEY 557 and MAR 557.
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.
Prerequisite: MAR 501, 502, 504, 506, or permission of instructor
Spring, 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.
Prerequisite: GEO 514 or permission of instructor
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.
Prerequisite: Familiarity with concepts of ecology or biological oceanography
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.
Prerequisite: Permission of instructor
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
3 credits, ABCF grading

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.
Prerequisites: MAR 502 and permission of instructor
Spring, 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.
Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading

MAR 574 Special Topics: Ocean Dynamics
Introductory dynamical oceonography, framework and applications.
Spring, 1-4 credits, ABCF grading

MAR 575 Research foci in the Ecology, Geology, and Biogeochemistry of Intertidal Wetlands
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

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.
Prerequisite: Permission of instructor
Fall, 2 credits, ABCF grading

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 microcomputer information systems, environmental law, coastal pollution, dredge spoil disposal, science and technology in public institutions, and coastal marine policy.
Prerequisite: Permission of instructor
Fall and spring, 1-4 credits, ABCF grading

MAR 580 Seminar
A weekly series of research seminars presented by visiting scientists and members of the staff.
Fall and spring, 0 credits, S/U grading

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 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.
Prerequisite: Stratigraphy and sedimentary marine geology
Fall, 2 credits, S/U grading

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.
Prerequisite: BEE 550, BEE 552; MAT 131 or equivalent; any statistics course
Spring, 3 credits, ABCF grading

MAR 590 Research

Original investigation undertaken with the supervision of the advisor.
Prerequisite: Permission of instructor
Fall and spring, 1-12 credits, S/U grading
May be repeated for credit

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

Atmospheric Science Courses

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 climactic changes, greenhouse gases and the greenhouse effect, analogues with other planets, the Gaia hypothesis, climate modeling, and deforestation and the depletion of ozone.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
Spring, 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.
Prerequisites: MAR or OCN graduate standing or permission of instructor
Spring, alternate years, 2 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.
Prerequisites: MAR or OCN graduate standing or permission of instructor
Fall, alternate years, 3 credits, ABCF grading
May be repeated 1 times for credit

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 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 are discussed, and theories of middle atmospheric motions are developed.
Prerequisite: Permission of instructor
Fall, alternate years, 3 credits, ABCF grading

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 hypsomatric 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.
Prerequisite: one year of calculus
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.
Prerequisite: one year of calculus
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 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.
Prerequisite: Permission of instructor
Fall, alternate years, 3 credits, ABCF grading
May be repeated once for credit

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 582 Advanced Atmospheric Dynamics
Application of the concepts of balanced flow and potential vorticity thinking–conservation and inversion–to study wave propagation, baroclinic instability, evolution of cyclones an baroclinic waves, and wave-mean flow interactions.
Prerequisite: MAR 594
Spring, 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.
Prerequisites: OCN or MAR standing or permission of instructor
Spring, 2 credits, ABCF grading

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.
Spring, 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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
Fall, alternate years, 3 credits, ABCF grading

MAR 597 Climate Dynamics
Fundamentals of the observed climate system. Simple climactic 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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
Spring, alternate years, 4 credits, ABCF grading

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.
Prerequisite: MAR 501 or permission of instructor
Spring, 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.
Prerequisite: Dynamical Oceanography I
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.
Prerequisite: MAR 501
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.
Prerequisite: Permission of instructor
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 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 qualitfying 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 314 (631) 632-8484
Graduate Program Director: Dilip Gersappe, Old Engineering Building (631) 632-8499
Department Office: Old Engineering Building 314, Zip 2275 (631) 632-8484
Office Staff: Gertha Benoit-Hollis, 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 a Ph.D. or Master of Science degree, (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 students take 24 credits, of which at least 21 credits are coursework and three credits are ESM 599. The advantages of this program over the regular M.S. program 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 interdisciplinary 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 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 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 stu-

dents within the department. Several faculty members hold guest appointments at BNL, while Brookhaven scientists participate in research and teaching within the department. The Department of Energy awarded the contract to manage BNL starting 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 motion and structures attendant to crystal 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 (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 (EBSD) analysis system based on the TSL/EDAX orientation imaging and Phase-ID software that allows for nondestructive 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 microspectroscopoy and synchrontron 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, industry, 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 laster 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 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

Berndt, Christopher C., Ph.D., 1980, Monash University, Australia: Protective coatings; mechanical properties; biomaterials; thermal spray.

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.

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.

Gouma, Pelagia-Irene (Perena), Ph.D., 1996, University of Birmingham, England: Advanced materials characterization; electron microscopy and microanalysis techniques; chemical sensors.

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 magnetoresistance of magnetic metals; epitaxial growth of magnetic materials.

Mahajan, Devinder, Ph.D., 1979, University of British Columbia: Inorganic chemistry; fuel cells; catalysis.

Adjunct Faculty

Allan, Marita, Ph.D., 1991, Monash University, Australia: Mechanical and physical properties of cementitious materials.

Francis, A.J., Ph.D., 1971, Cornell University: Microbiology; biosystems; process sciences.

Frisch, Harry Lloyd, Ph.D., 1952, Polytechnic Institute of Brooklyn: Physical chemistry.

Goland, Allen N., Ph.D., 1956, Northwestern University: Solid-state physics; defects; interaction of radiation with condensed matter.

Hirvonen, James, Ph.D., 1971, Rutgers University: Investigations of ion implantation in silicon using particle channeling.

Hough, Paul, Ph.D., 1950, Cornell University: Particle physics.

Isaacs, Hugh S., Ph.D., 1963, Imperial College, London: Corrosion; scanning techniques for surface defects; surface analysis.

Johnson, Peter D., Ph.D., 1978, University of Warwick, England: Spin polarized photoemission.

Kim, Mahn Won, Ph.D., 1975, University of California, Santa Barbara: Light scattering; Languir-Blodgett films.

Lewis, Laura J.H., Ph.D., 1993, University of Texas, Austin: Materials science and engineering.

Marcus, Paul, Ph.D., 1943, Massachusetts Institute of Technology: Atomic-scale surface structure; electron diffraction; magnetic properties of metals.

McLeod, K.J., Ph.D., 1986, Massachusetts Institute of Technology: Biomaterials.

Nissim, Garti, Ph.D., 1974, Hebrew University of Jerusalem: Organic chemistry.

Papazian, John, Ph.D., 1969, Columbia University: Physical metallurgy and forming of aluminum matrix composites.

Powell, James, Sc.D., 1958, Massachusetts Institute of Technology: Chemical engineering.

Samuilov, Vladimir, Ph.D., 1986, Belarus State University: Physics.

Schwarz, Steven, Ph.D., 1980, Stanford University: Materials and device characterization by SIMS.

Strozier, John, J., Ph.D., 1958, Cornell University: Solid state physics.

Tobin, Al, Ph.D., 1968, Columbia University: Metallurgy.

Ulman, Abraham, Ph.D., 1978, Weizmann Institute of Science: Physical and organic chemistry.

Welch, David O., Ph.D., 1964, University of Pennsylvania: Theoretical materials science; kinetics of diffusion; energetics; statistical mechanics; crystal lattice defects; equations of state phase equilibria; radiation effects.

Warren, John B., Ph.D., 1978, University of Florida: Analytical electron microscopy; X-ray fluorescence; semiconductor defects.

Zhu, Yimei, Ph.D., 1987, Nagoya University, Japan: Materials physics.

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 Kinetics and Transformations I. If the student does not receive a minimum of a B in a core course, they may repeat that course one other time.

3. In addition, all students who are supported as Teaching Assistants must complete ESM 501 Teaching Techniques and ESM 698.

4. Only six credits of ESM 696 are allowed.

5. All courses taken outside the department require permission from the Graduate 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 Soilds; ESM 513 Strength of Materials; and ESM 521 Kinetics and Transformations I. If the student does not receive a minimum of a B in a core course, they may repeat that course one other time.

3. In addition, all students who are supported as Teaching Assistants must complete ESM 501 Teaching Techniques and ESM 698.

4. The 30 credits must include six credits of ESM 599.

5. Only six credits of ESM 696 are allowed.

6. All courses taken outside the department require permission from the Graduate 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 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).

2. The 24 course credits must include the following three core courses: ESM 511 Thermodynamics of Soilds; ESM 513 Strength of Materials; and ESM 521 Kinetics and Transformations I. If the student does not receive a minimum of a B in a core course, they may repeat that course one other time.

4. All students must complete ESM 501 Teaching Techniques.

5. The student must pass at least three credits of ESM 698 and six credits of ESM 699.

6. Only six credits of ESM 696 are allowed.

7. All courses taken outside the department require permission from the Graduate Director.

C. Preliminary Examination

The preliminary examination must be taken by the end 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 MSE Department. If a second examination is required, it must be completed by the tenth week of the sixth semester.

E. 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.

F. 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.

G. 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.

H. 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 Techniques
Introduction to basic pedagogical technique. Discussion of the various phases of teaching, including preparation, classroom technique, and student evaluation. Problems and pitfalls and how to avoid them.
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, exidation, 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, anelasticity, plasticity, dislocation theory, cohesive strength, fracture, and surface wear. Attention is given to strengthening mechanisms for solids, metals, ceramics, and polymers.
Fall, 3 credits, ABCF grading

ESM 521 Kinetics and Transformations I
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.
Spring, 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.
Spring, 3 credits, ABCF grading

ESM 523 Sold-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, galvomagnetic, thermomagnetic, and thermoelectric effects. Hall effect and magnetoresistance. Conductivity in thin films.
Fall, 3 credits, ABCF grading

ESM 531 Kinetics and Transformations II
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.
Fall, 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.
Fall, 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.
Fall, 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 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.
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
Spring, 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 martenistic 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 Full Time Summer Research
May be repeated for credit

Mathematics (MAT)

Chairperson: Detlef Gromoll, Mathematics Building 5-116 (631) 632-8290
Graduate Program Director: Lowell Jones, Mathematics Building 5-115 (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 5-115 (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 School of Professional Development 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 courses in the program are given in the evenings and in the summer on a rotating basis; each 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. Almost 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; grades in mathematics courses and test scores on the Graduate Record Examination (GRE) General and Advanced Tests are also considered;

C. Foreign students: Evidence that the student can understand and speak English sufficiently well; a TOEFL score of 550 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., *Director of the Institute for Mathematical Sciences.*[2] Ph.D., 1954, Princeton University: Dynamical systems; topology; geometry.

Sullivan, Dennis[2], Ph.D., 1965, Princeton University: Dynamical systems; topology; geometry; partial differential equations.

Distinguished Service Professor

Kra, Irwin, Ph.D., 1966, Columbia University: Complex analysis; Kleinian groups.

Professors

Anderson, Michael, Ph.D., 1981, University of California, Berkeley: Differential geometry.

Barcus, William, *Emeritus.* D.Phil., 1955, University of Oxford, England: Algebraic topology.

Bishop, Christopher, Ph.D., 1987, University of Chicago: Complex analysis.

Ebin, David, 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, Detlef, *Chairperson.* 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, *Graduate Program Director.* Ph.D., 1970, Yale University: Topology; geometry.

Knapp, Anthony, *Emeritus.* Ph.D., 1965, Princeton University: Lie groups; representation theory.

Kumpel, Paul[1], 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, Mikhail, *Deputy Director of the Institute for Mathematical Sciences.*[2] 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, Scott, *Undergraduate Director.*[2] 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.

James H. Simons Instructors

Casalaina-Martin, Sebastian, Ph.D., 2004, Columbia University: Algebraic geometry.

Craw, Alastair, Ph.D., 2001, University of Warwick, England: Algebrair geometry.

Gurel, Basak, Ph.D., 2003, University of California at Santa Cruz: Symplectic topology; Hamiltonian clynamical 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.

Sawon, Justin, Ph.D., 2000, Cambridge University, England: HyperKähler manifolds; complex algebraic geometry; quantum invariants of knots and three-manifolds; mathematical physics.

VIGRE Fellow

Kudzin, Matthew, Ph.D., 2002, Indiana University: Differential geometry.

Number of teaching, graduate, and research assistants, fall 2003: 68

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, 552 Supervised Student Teaching

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
Corequisite: MAE 552 and 554
Fall, spring, 3 credits, S/U 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

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, S/U 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. Froebenius theorem. Lie derivatives. Immersions and submersions. DeRham chomology, 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, Jordon normal form, binlinear 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.
Prerequisite: MAT 535
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 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; Lebesque 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 differtial geometry: Review of basic results in several complex variables/analytic geometry, sheaves and cohomology of sheaves, complex vector bundles (hermitian metrics, connections, curvature, Chern classes, positivity), Kaehler manifolds, projective manifolds, toplogical consequences of the Kaehler condition, Kaehler identities, hodge theory, Hodge decomposition for Kaehler manifolds, Kodaira vanishing theorem, Hard Lefschetz Theorem, divisors and line bundles, linear systems and maps to projective space, 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, alternate years, 3 credits, ABCF grading
May be repeated for credit

MAT 546 Differential Equations
Distributions and the Fourier transform; compact operators, Fredholm theory; pseudodifferential operators; Sobolev spaces; regularity theory for elliptic operators; Hodge theorem.
Prerequisite: MAT 544
Co-requisite: MAT 550
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; differentation of the integral; change of variable of integration.
Prerequisite: MAT 544
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 prolem, energy estimates, maximum principles, Harmonic analysis; singular integrals, Hausdorff measure, harmonic measure, Hardy spaces, Functional analysis; spectral theory, distributions, Banach algebras.
Prerequisite: MAT 544, 550
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.
Prerequisite: MAT 531, MAT 534
Fall, 3 credits, ABCF grading

MAT 566 Differential Topology
Vector bundles, transversality, and characteristic classes. Further topics such as imbeddings and immersions, intersection theory, surgery, and foliations.
Prerequisite: MAT 531
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.
Prerequisite: MAT 531
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. Other basic topics may be covered as time permits.
Prerequisite: MAT 531, MAT 568
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

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 of these courses may be taken for repeated credit. Visit our Web site for the most current descriptions: *www.math.sunysb.edu.*

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 summer, 3 credits, S/U grading
May be repeated for credit

MAT 598 Teaching Practicum
Seminar and workshop for new teaching assistants.
Fall, 3 credits, S/U grading

MAT 599 M.A. Research
1-12 credits, S/U grading
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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
Spring, 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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
Spring, 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
Spring, 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.
Prerequisite: Permission of instructor
Fall, 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.
Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading
May be repeated for credit

MAT 626 Topics in Complex Analysis
Topics selected from Riemann surfaces, quasiconformal mappings, several complex variables, Fuchsian groups, Kleinian groups, moduli of Riemann surfaces and Kleinian groups, analytic spaces, singularities.
Prerequisite: Permission of instructor
Fall, 3 credits, S/U grading
May be repeated for credit

MAT 627 Topics in Complex Analysis
Topics selected from Riemann surfaces, quasiconformal mappings, several complex variables, Fuchsian groups, Kleinian groups, moduli of Riemann surfaces and Kleinian groups, analytic spaces, singularities.
Prerequisite: Permission of instructor
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, equations with constant coefficients, solvability of linear equations, Fourier integral operations, nonlinear equations.
Prerequisite: Permission of instructor
Fall, 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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
Fall, 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.
Prerequisite: Permission of instructor
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.
Prerequisite: MAT 552
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.
Prerequisite: Permission of instructor
Fall, 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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
Fall, 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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
Fall, 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.
Prerequisite: Permission of instructor
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. These courses may be taken for repeated credit. Each of these courses carries three credits. Visit our Web

site for the most current descriptions: *www.math.sunysb.edu.*

MAT 662 Advanced Topics in Algebra
Prerequisite: Permission of instructor
Fall, 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
Fall, 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
Fall, 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
Fall, 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
Fall, 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
Fall, 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.
Prerequisite: Permission of instructor
Fall, 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.
Prerequisite: Permission of instructor
Spring, 3 credits, S/U grading
May be repeated for credit

Other Courses

Each of the following courses may be taken only with the approval of the graduate program director. These courses have variable and repetitive credit. Visit our Web site for the most current descriptions: *www.math.sunysb.edu.*

MAT 696 Mathematics Seminar
1-12 credits, S/U grading
May be repeated for credit

MAT 697 Mathematics Colloquium
1-12 credits, S/U grading
May be repeated for credit

MAT 698 Independent Study
1-12 credits, S/U grading
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: Lin-Shu Wang, 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 distribution 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, heat transfer and fluid mechanics characteristics of non-Newtonian fluids, and internal combustion engine heat transfer. Active research is also conducted on various aspects of crystal growth (e.g., modeling, simulation, material characteristics, process control, and system design) for electronic, optoelectronic, laser, sensor, and photovoltaic applications. The process-modeling laboratory consists of state-of-art computing systems including an IBM SP2 scalable computer with eight nodes, a multiprocessor Silicon Graphics Onyx2, and animation devices.

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:saphire 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 Bridgeman 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 fluids, requires accurate, convenient-to-implement methods for predicting and correlating the thermodynamic properties of the fluids present in the process. This concentration is designed to provide students with the analytical tools needed to model and predict the thermophysical properties of fluids. Current studies include the development of statistical mechanical techniques to assess the relation between intermolecular forces and the thermodynamic, dielectric, optical, and transport properties of fluids, fluid mixtures, and suspensions. Research is also being conducted on combustion heat engines, aiming at achieving high efficiency.

Admission

For admission to the M.S. and Ph.D. programs in Mechanical Engineering the following are required:

A. A bachelor's degree in mechanical engineering or a related field such as another engineering discipline, physical science, or mathematics;

B. A grade point average of at least B or equivalent in engineering, mathematics, and science courses;

C. Completion and submission of the Graduate Record Examination (GRE) General Test;

D. Acceptance by both the Department of Mechanical Engineering and the Graduate School.

Faculty

Professors

Chiang, Fu-pen, *Chairperson.* Ph.D., 1966, University of Florida: Experimental mechanics; solid mechanics; photoelasticity; moiré and laser methods for stress analysis.

Harris, Stewart, Ph.D., 1965, Northwestern University: Brownian motion theory and its applications; epitaxial crystal growth.

Kincaid, John, Ph.D., 1974, Rockefeller University: Statistical mechanics and thermodynamics.

Nakamura, Toshio, Ph.D., 1986, Brown University: Solid mechanics; composite materials; computational fracture mechanics.

O'Brien, Edward E., *Emeritus.* Ph.D., 1960, Johns Hopkins University: Turbulent transport.

Tasi, James, Ph.D., *Emeritus.* 1962, Columbia University: Solid mechanics; shock waves in crystal lattices.

Associate Professors

Ge, Q. Jeffrey, Ph.D., 1990, University of California, Irvine: Design automation; robotics; CAD/CAM; mechanical systems analysis and simulation.

Huang, Peisen S., Ph.D., 1993, University of Michigan, Ann Arbor; Dr.Eng., 1995, Tohoku University, Japan: Optical metrology; 3-D machine vision.

Kao, Imin, Ph.D., 1991, Stanford University: Dextrous robotic manipulation with soft contacts; stiffness control; modern wiresaw manufacturing process modeling and control; wafer manufacturing; smart contact surface technology using MEMS; Taguchi Methods and quality engineering.

Ladeinde, Foluso, Ph.D., 1988, Cornell University: Supersonic and hypersonic flows, flow control, turbulent flows, computational fluid dynamics, aircraft engines, combustion, and numerical mathematics.

Longtin, Jon P., Ph.D., 1995, University of California, Berkeley: Heat transfer at fast time scales; ultrafast laser liquid- and laser-solid interactions; laser processing, measurement, and diagnostics for thermal systems; surface tension effects.

Metzger, John D., Ph.D., P.E., 1989, University of New Mexico: Nuclear engineering; space nuclear power/propulsion; thermal-hydraulic design; modeling, analysis; trajectory analysis.

Rastegar, Jahangir, Ph.D., 1976, Stanford University: Mechanical design.

Wang, Lin-Shu, Ph.D., 1966, University of California, Berkeley: Thermodynamics; combustion heat engines; turbulence and wind energy.

Zhang, Hui, Ph.D., 1994, Polytechnic University: Thermal system design; biothermal-fluid sciences; solidification; materials processing; computational methods.

Assistant Professors

Attinger, Daniel E., Ph.D., 2001, ETH Zurich: Microscale heat transfer; micro- and bio-fluidics.

Kukta, Robert V., Ph.D., 1998, Brown University: Solid mechanics; mechanics of thin films; micromechanical modeling of defects in crystals, crystal growth.

Nearon, Michelle Denise, Ph.D., 2000, Stony Brook University: Turbulence and computational fluid mechanics.

Singh, Raman P., Ph.D., 1995, University of Rhode Island: Experimental solid mechanics; fracture mechanics; advanced and heterogeneous materials.

Su, Yu-Hsuan, Ph.D., 1999, Massachusetts Institute of Technology: MEMS technology and piezoelectrics.

Zheng, Lili, Ph.D. 1994, Cambridge University, England: Turbulence combustion; solidification; magnetohydrodynamics; two-phase flow.

Adjunct Faculty

Chevray, Rene, *Professor, Department of Mechanical Engineering, Columbia University.* Ph.D., 1967, University of Iowa: Turbulence and chaos and the onset of turbulence.

Philippacopoulos, Aristodimos J., *Professor, Brookhaven National Laboratory.* Ph.D., 1979, Polytechnic Institute of New York: Computational mechanics; dynamics of structural and foundation systems; earthquake engineering; wave propagation.

Rohatgi, Upendra Singh, *Professor, Brookhaven National Laboratory.* Ph.D., 1975, Case Western Reserve University: Fluid mechanics; heat transfer; two-phase flow; numerical analysis; and turbomachinery.

Affiliated Faculty

Bluestein, Daniel, *Department of Biomedical Engineering.* Ph.D., 1992, Tel Aviv University, Israel: Fluid mechanics and biofluids.

Cess, Robert D., *Distinguished Professor and Distinguished Service Professor Emeritus, Marine Sciences Research Center.* Ph.D., 1959, University of Pittsburgh: Atmospheric sciences; climate modeling; greenhouse effect; nuclear winter theory.

Rubin, Clinton, *Chair of Department of Biomedical Engineering and Director of Center for Biotechnology.* Ph.D., 1983, University of Bristol: Biophysical regulation of tissue growth and repair; modeling *in vivo* skeletal strains.

Stell, George, *Emeritus, Department of Chemistry.* Ph.D., 1961, New York University: Molecular theory of the fluid state; ionic fluid structural properties; transport in multiphase systems.

Wong, Teng-fong, *Professor, Department of Geosciences.* Ph.D., 1980, Massachusetts Institute of Technology: Experimental rock physics; fault mechanics.

Number of teaching, graduate, and research assistantships, fall 2003: 46

Academic Advisor

Each graduate student is assigned an academic advisor in his or her area of interest before registration. The academic advisor will guide the student in course selection, research, and other areas of academic importance. Students receiving financial aid must select a thesis research advisor before the start of their second semester.

Academic Standing

An average in all coursework of B or higher is a minimum requirement for satisfactory status in the graduate program. In the doctoral program, a

3.5 grade point average is expected, exclusive of MEC 599, MEC 698, and MEC 699.

Degree Requirements

Requirements for the M.S. Degree

A minimum of 30 credits is required for the M.S. degree.

A. Course Requirements

1. M.S. with thesis: 21 approved graduate course credits and an accepted thesis, which is registered as nine credits of MEC 599 and 696 combined.

2. M.S. without thesis: 30 approved graduate credits. No credit for MEC 599 (Master's Thesis) is approved for fulfilling this requirement. No more than six credits of MEC 696 may be applied toward the course requirements.

3. MEC 507. The graduate program director may waive this requirement if the student has taken an equivalent course elsewhere. A second applied mathematics course such as MEC 508 is also encouraged.

4. All full-time graduate students are required to attend at least half of the Department seminars.

5. A minimum of 18 graduate credits, of which 15 credits are in courses other than MEC 599 and MEC 696, must be taken in the Department of Mechanical Engineering. All courses taken outside the department for application to the graduate degree requirements are subject to approval of the student's advisor and the graduate program director.

B. Transfer Credits

A maximum of 12 graduate credits may be transferred from other programs toward the M.S. degree. These may include up to six credits from other institutions. The maximum also includes any credits received from taking Mechanical Engineering courses while having non-degree status at Stony Brook as an SPD or GSP student. All requests for transfer of credits require the approval of the graduate program director.

C. Thesis Requirements

A student choosing the thesis option must select a research advisor. Upon completion, the thesis must be defended in an oral examination before a faculty committee of at least three members of which at least two must be Mechanical Engineering faculty. A student choosing the thesis option may not switch to the non-thesis option without permission of the graduate program committee.

Requirements for the Ph.D. Degree

A. Course Requirements

1. 18 approved graduate course credits beyond the M.S. degree requirement. A minimum of nine credits, excluding MEC 599, 696 and 699, must be taken in the department.

2. MEC 507. The graduate program director may waive this requirement if the student has taken sufficient applied mathematics courses elsewhere.

3. All full-time graduate students are required to attend at least half of the Department seminars.

4. All courses taken outside the department for application to the graduate degree requirements are subject to approval of the student's advisor and the graduate program director. The advisor may impose additional course requirements.

B. Transfer Credits

A student who has entered the Ph.D. program with an M.S. degree from another institution may transfer up to 12 credits; a student with a master's degree from Stony Brook may transfer up to six credits toward the Ph.D. degree. Credits used to obtain any prior degrees are not eligible for transfer. Requests for transfer of credits must be submitted to the graduate program director.

C. Areas of Concentration

The student selects an area of concentration in one of the following areas of Mechanical Engineering:

1. Thermal Sciences and Fluid Mechanics
2. Solid Mechanics
3. Mechanical Design

D. Written Qualifying Examination

The written qualifying examination is offered once every year, usually in January. Students who enter the graduate program with an M.S. degree from another institution are encouraged to take the examination the first time it is offered after they begin academic residency. Students who enter the graduate program without an M.S. degree are encouraged to take the examination the first time it is offered following three academic semesters in residence. Both categories of students who fail to take this opportunity must take the examination the next time it is offered during their residency. Part-time students should follow a rule based on graduate course credit hours (determined by the equivalence of nine credits with one semester in residence). Each student can take the written qualifying examination two times before being dismissed from the Ph.D. program.

The written qualifying examination consists of two parts. Part I covers applied mathematics. Part II corresponds to the student's area of concentration.

More precise information on the exam, including a list of suggested courses for each subject in the exam, is available in the departmental office, as are samples of previous examination questions.

Each student taking the examination is required to submit a written statement to the graduate program director with a declaration of both areas chosen at least one month before the announced exam date.

E. Minor Area of Concentration

In addition to the major area of concentration, each student must select a second, minor area from the following list: Thermodynamics and Heat Transfer, Fluid Mechanics, Solid Mechanics, Mechanical Design, Electrical Engineering, Electronic Engineering, Material Science and Engineering, Information Sciences, Computational Sciences (including Applied Mathematics), Biomedical Engineering, Bioengineering, Environmental Sciences, and Geological Sciences. A petition to select a minor area that is not contained in this list must be approved by the Graduate Program Committee.

A student will be required to take a coherent sequence of three graduate level courses in the minor area and obtain a grade of B or better in each of the courses. However, students must submit a list of five courses from the proposed minor field no later than the time he or she applies to take the qualifying exam. The courses in the minor field must be approved by the Graduate Program Committee, with the recommendation of the student's advisor.

Upon submission of the list of five courses, students must provide an explanation for the list, how the courses are related, and the rationale for the courses. Note that students are not required to have taken the courses in the minor field before taking the qualifying exam. However, the minor requirement must be satisfied before the student can be admitted to candidacy.

F. Advancement to Candidacy

A student will be advanced to candidacy for the Ph.D. degree when all formal coursework has been completed and all the requirements listed in items A through E have been satisfied. These requirements must be completed within one calendar year after passing the written qualifying examination. Advancement to candidacy must be one year before the beginning of the semester in which a student plans to defend his or her dissertation.

G. Teaching

Ph.D. students are required to take three credits of MEC 698 Practicum in Teaching II as part of the degree requirement. This requirement may be met by taking one three-credit MEC 698, or a combination of one-credit and/or two-credit MEC 698, totaling three credits. The form of this practicum may include making class presentations, teaching in recitation classes, and preparation and supervision of laboratory classes. Note that MEC 697 Practicum in Teaching I does not meet this requirement.

A faculty advisor is responsible for providing feedback and formal evaluation of MEC 698.

H. Dissertation Examining Committee and Dissertation Proposal

The student chooses a dissertation topic in consultation with his or her doctoral dissertation advisor as soon as possible after passing the written qualifying examination. Within one year after passing the written qualifying examination, a dissertation examining committee is established. The committee must include at least three members from the Department of Mechanical Engineering, including the dissertation advisor, and at least one member from another program or from outside the University. The committee must be approved by the graduate program director upon recommendation by the dissertation advisor. The official recommendation for the appointment of the dissertation examining committee is made to the dean of the Graduate School.

Dissertation research is an apprenticeship for the candidate, who, under the supervision of the dissertation advisor, independently carries out original work of significance. The dissertation examining committee provides a means of exposing the candidate's ideas to a variety of views, and helps to guide and oversee the candidate's research progress, which is reviewed by the committee each year. The chairperson of the committee must submit a written report to the graduate program director on the student's progress after each review.

In addition, the student is required to submit a written dissertation proposal and present it in an oral examination conducted by the dissertation examining committee. The written dissertation proposal must be distributed to the committee members at least two weeks before the oral examination. The oral examination probes the doctoral student's ability and examines the progress, direction, and methodology of the dissertation research. The student will be examined on the dissertation topic and its objective, the problem formulation, research approach, and knowledge in related areas. The majority of the dissertation examining committee must approve the student's performance.

I. Dissertation Defense

At the completion of the dissertation, approval of the dissertation involves a formal oral defense. The formal defense is open to all interested members of the University community. A candidate must fill out the Doctoral Degree Defense Form (available on the Graduate School Web page) with dissertation abstract as well as other relevant details, and submit the form to the graduate program director at least three weeks in advance of the proposed event. The form is forwarded by the graduate program director to the dean of the Graduate School, which will be responsible for advertising the defense to the University community. Copies of the dissertation are to be distributed to the committee members at least two weeks before the dissertation defense; one copy is to be kept in the departmental office for examination by the faculty. The final approval of the dissertation must be by a majority vote of the dissertation examining committee.

Courses

MEC 500 Introduction to Computer Integrated Design and Manufacturing

Topics include part design specification; Computer Aided Design (CAD); CAD-driven engineering analysis; Computer Aided Manufacturing (CAM); integration of CAD/CAM; computer integrated manufacturing industrial robotics; CAD-driven inspection and measurement; concurrent engineering; Internet-based design and manufacturing.
Prerequisite: B.S. in engineering
Fall, 3 credits, ABCF grading

MEC 501 Convective Heat Transfer and Heat Exchange

Differential and integral formulation. Exact and approximate solutions. Topics include parallel and boundary layer flows, similarity solutions, external and internal flows, laminar and turbulent convection, and forced and free convection.
Spring, 3 credits, ABCF grading

MEC 502 Conduction and Radiation Heat Transfer

Heat conduction and conservation law; intensity of radiation, black body radiation, and Kirchoff's law, analysis of heat conduction problems; analysis of radiative exchange between surfaces and radiative transport through absorbing, emitting, and scattering media.
Fall, 3 credits, ABCF grading

MEC 504 Thermal Analysis and Design of Electronic Systems

Thermal characteristics of electronic components and systems, reliability considerations, design concepts, basic modes of heat transfer and fluid flow. Topics of applied heat transfer: heat exchanger, boiling and condenstation, cooling techniques, cooling at various packaging levels, thermal elastic effects, computations for electronic systems.
Fall, alternate years, 3 credits, *ABCF grading*

MEC 505 Modeling and Simulation for Materials Processing and Manufacturing

Importance of modeling and simulation; interface between computer models and actual processes; microscopic versus macroscopic models; continuum models; thermo-fluid models, chemical transport, magnetic and electrical effects, and stress field; simulation schemes: finite difference versus finite element methods; software development; post-processing: graphical representation, video animation; case studies; melting/solidification bulk crystal growth; thin film deposition.
Spring, alternate years, 3 credits, ABCF grading

MEC 506 Energy Management in Commercial Buildings

Topics include basic heating, ventilating, and air-conditioning (HVAC) system design and selection for commercial buildings (includes both low-rise and high-rise buildings); selec-

tion of central plant components and equipment; calculation of space heating and cooling load; computer techniques for estimating annual energy consumption; design tools for reducing energy consumption; ASHRAE codes; building controls; BACnet.
Prerequisite: B.S. in mechanical engineering or related fields
Fall, alternate years, 3 credits, ABCF grading

MEC 507 Mathematical Methods in Engineering Analysis I
An introduction to the use of mathematical analysis techniques for the solution of engineering analysis problems and the simulation of engineering systems. Both continuous and discrete methods are covered. Initial and boundary value problems for ordinary and partial differential equations are treated.
Fall, 3 credits, ABCF grading

MEC 508 Mathematical Methods in Engineering Analysis II
A continuation of the material covered in MEC 507. Introduction to and application of numerical analysis techniques used in engineering such as finite elements and fast Fourier transforms. Determination of response characteristics of dynamic systems. Combinatoric methods and techniques for optimization of engineering design and systems/process analysis problems.
Prerequisite: MEC 507
Spring, alternate years, 3 credits, ABCF grading

MEC 510 Object-Oriented Programming for Scientists and Engineers
Practical introduction to C++ and object-oriented programming for a first programming course for scientists and engineers. Covers basics of application software development such as problem decomposition, structure charts, object modeling, class diagrams, incremental code building, and testing at a beginner's level. Features an array of case studies to show how engineering problems are solved using object-oriented programming. The course follows the evolution of programming ideas from the use of a single function to the use of structural charts and functions to modularize and finally to the use of object-oriented programming.
Prerequisite: B.S. in science or engineering
Spring, alternate years, 3 credits, ABCF grading

MEC 511 Mechanics of Perfect Fluids
Lagrangian and Eulerian frames. Dynamical equations of momentum and energy transfer. Two-dimensional dynamics of incompressible and barotropic perfect fluids and of the compressible perfect gas. Conformal mapping applied to two-dimensional fluid dynamics. Jets and cavities. Surface waves, internal waves. Perfect shear flows.
Spring, 3 credits, ABCF grading

MEC 512 Mechanics of Viscous Fluids
The role of viscosity in the dynamics of fluid flow. The Navier-Stokes equations, low Reynolds number behavior including lubrication theory, percolation through porous media, and flow due to moving bodies. High Reynolds number behavior including steady, unsteady, and detached boundary layers, jets, free shear layers, and wakes. Phenomenological theories of turbulent shear flows are introduced.
Fall, 3 credits, ABCF grading

MEC 514 Advanced Fluid Mechanics: Introduction to Turbulence
Introductory concepts and statistical descriptions: kinematics of random velocity fields; equations of motion; experimental techniques: isotropic turbulence, closure problem; transport processes.
Prerequisite: MEC 512
Spring, alternate years, 3 credits, ABCF grading

MEC 521 Thermodynamics
This course begins with a review of the fundamental concepts and laws of classical thermodynamics and with a short introduction to statistical thermodynamics. Then the thermostatic theory of equilibrium states and phase transitions is treated, followed by the thermodynamic theory of processes and cycles of simple and composite systems, including heat engines. Special topics may include irreversible thermodynamics, kinetic theory, and other topics of current interest.
Spring, 3 credits, ABCF grading

MEC 524 Computational Methods for Fluid Mechanics and Heat Transfer
Introduction of finite difference, finite volume, and finite element methods for incompressible flows and heat transfer. Topics include explicit and implicit schemes, accuracy, stability and convergence, derived and primitive-variables formulation, orthogonal and non-orthogonal coordinate systems. Selected computer assignments from heat conduction, incompressible flows, forced and free convection.
Prerequisite: MEC 507
Fall, alternate years, 3 credits, ABCF grading

MEC 525 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

MEC 532 Mechanical Vibration
Introduction to vibration analysis of structures and machines. Includes free and forced response of linear lumped parameter systems, modal analysis of one- and two-dimensional continua, elements of nonlinear vibration analysis, methods of active and passive vibration control, and spectral analysis of randomly excited vibration.
Spring, 3 credits, ABCF grading

MEC 535 Engineering Stress Analysis
Provides and overview of stress analysis for practicing engineers and scientists.
Spring, 3 credits, ABCF grading

MEC 536 Mechanics of Solids
A unified introduction to the fundamental principles, equations, and notation used in finite deformation of solids, with emphasis on the physical aspects of the subject. Cartesian tensor representation of stress, principal values, finite strain, and deformation. Conservation of mass, momentum, and energy. Formulation of stress-strain relations in elasticity, and compatibility relations. The use of general orthogonal coordinate systems in the equations governing solids. Principles of virtual displacement and virtual work.
Fall, 3 credits, ABCF grading

MEC 539 Introduction to Finite Element Methods
(Formerly Finite Element Methods in Structural Analyses) Theory of finite element methods and their application to structural analysis problems. Matrix operations, force and displacement methods. Derivation of matrices for bars, beams, shear panels, membranes, plates, and solids. Use of these elements to model actual structural problems. Weighted residual techniques and extension of the finite element method into other areas such as heat flow and fluid flow. Laboratory sessions introduce use of the computer in solving finite element problems. Programs for the solution of force and displacement method problems are configured. A computer project consisting of the solution and evaluation of a structural problem is required.
Spring, alternate years, 3 credits, ABCF grading

MEC 540 Mechanics of Engineering Structures
An introduction to variational principles of mechanics and the development of approximation methods for the solution of structural mechanics problems. Linear and nonlinear theories of beams and thin plates are developed along with their framework for numerical solutions. An introduction of the general theory of structural stability is presented along with its application to the buckling and initial postbuckling behavior of beams and plates.
3 credits, ABCF grading

MEC 541 Elasticity
Formulation of boundary value problems. Compatibility equations and reciprocal theorem. Torsion of noncircular cross-sections. Fundamental solutions for two- and three-dimensional domains. Potential function formulations. Use of integral transforms and complex variable approaches. Formulation and solution of problems in thermoelasticity.
Prerequisite: MEC 536
Spring, 3 credits, ABCF grading

MEC 543 Plasticity
Stress and deformation of solids: yield criteria and flow rules for plasticity deforming solids; the notion of a stable inelastic material; static and dynamic analysis of plastic bodies under mechanical and thermal loading; use of load bounding theorems and the calculation of collapse loads of structures; the theory of the slip-line field.
Prerequisite: MEC 541
Fall, alternate years, 3 credits, ABCF grading

MEC 552 Mechanics of Composite Materials
The course is concerned with the analysis of layered composite materials subject to mechanical loads. Cartesian tensor calculus is used. Homogeneous anisotropic media are studied first. The effect of layering is then analyzed. Applications to plates and shell are studied and analytical methods of solution are given. Numerical analysis of composite solids is also considered using finite difference and finite element methods.
Prerequisite: MEC 536
Fall or spring, alternate years, 3 credits, ABCF grading

MEC 560 Advanced Control Systems
Analytical methods applied to the design of multivariable linear control systems. Introduction to linear system theory: linearization, solution of linear matrix differential equations, stability, controllability, observability, transformations to canonical forms. Formulation of control objectives. Deterministic state observer. Full-state feedback control based on pole assignment and linear quadratic optimization theory. Linear systems with stochastic inputs and measurement noise. The response of linear systems to random input; stochastic state estimator (Kalman filter); separation principle of stochastic control and estimation; system robustness.
Fall or spring, alternate years, 3 credits, ABCF grading

MEC 567 Kinematic Analysis and Synthesis of Mechanisms
Introduction, mechanism structure, basic concepts of mechanisms, canonical representation of motion. Kinematic analysis, algebraic method, vector-loop method, complex number method, spherical and spatial polygon method, matrix method, dual-number quaternion method, screw coordinate method, line coordinate method, motor algebra method, type synthesis, number synthesis, coupler curves, curvature theory path generation, finite displacement theory, rigid body guidance, function generation, computer-aided mechanisms analysis and synthesis.
Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading

MEC 568 Advanced Dynamics
Newtonian and Lagrangian mechanics of rigid bodies; kinematics, inertia tensor, principle of momentum, principle of virtual work, potential and kinetic energy, equations of motion, extraction of information from the equations of motion, and application to engineering problems.
Fall, 3 credits, ABCF grading

MEC 571 Analysis and Design of Robotic Manipulators
Introduction to robot manipulators from the mechanical viewpoint, emphasizing fundamentals of various mechanisms and design considerations. Kinematics on 2D and 3D manipulators; statics and dynamics; motion planning; control fundamentals; algorithms development; computer-graphics simulation of manipulators; current applications.
Prerequisite: Permission of instructor
Fall or spring, alternate years, 3 credits, ABCF grading

MEC 572 Geometric Modeling for CAD, CAM
The de Casteljau algorithm, Bernstein polynomials, and Bezier curves. Spline curves. Polynomial interpolation and cubic spline interpolation. Rational Bezier and B-spline curves. Parametric surface patches. Parametric line constructs. Geometric continuity and geometric splines. Applications of geometric modeling methods in CNC machining, motion animation, and robotics.
Fall or spring, alternate years, 3 credits, ABCF grading

MEC 575 Introduction to Micro Electro-Mechanical Systems (MEMS)
An introduction to the fundamental knowledge and experience in the design and manufacture of microsystems. Emphasis will be placed on the methodologies for design, fabrication, and packaging of microsystems. An overview on fabrication and manufacturing technologies for producing microsystems will also be covered. Interdisciplinary nature of MEMS will be emphasized via various engineering principles ranging from mechanical and electrical to materials and chemical engineering. Introduction of the working principles of micro actuators, sensors, and transducers.
Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading

MEC 576 Microfluidics and Microscale Heat Transfer
Topics: flow/control of liquids/gases at small length scales; deviation from classical fluid behavior; boundary conditions/scaling laws at small scales; microscopic flow of heat at small length- and time-scales; application to MEMS devices, heat transfer in microelectronics devices, ultra-fast laser processing.
Prerequisite: B.S. in engineering or department approval
Fall, alternate years, 3 credits, ABCF grading

MEC 578 Reliability and Life Prediction of Electromechanical Systems
The modes of failure and the factors that play a role in the failure of mechanical components are presented. Failure modes and failure theories for brittle and ductile materials are introduced; special emphasis will be placed on the fatigue and fracture of materials. Distinctions will be drawn between the behavior of single crystal versus polycrystalline materials, and versus ductile and brittle materials. Reliability issues will be discussed regarding the design of series versus parallel systems.
Fall or spring, alternate years, 3 credits, ABCF grading

MEC 579 Optical Measurement
Introduction to optical measurement and its applications to the fields of solid mechanics, design and manufacturing, and thermal and fluid systems. Topics include fundamentals of optics, lasers, and detectors, dimensional and surface metrology, machine vision, measurement of temperature, concentration, and density, and optical techniques for stress analysis and nondestructive testing.
3 credits, ABCF grading

MEC 580 Manufacturing Processes
Process and materials of manufacture: metal cutting, forming, stamping, forging, welding, powder metallurgy; classification and fabrication characteristics of metals and composites; plastics; adhesives. Introduction to nonconventional manufacturing processes.
Fall or spring, alternate years, 3 credits, ABCF grading

MEC 584 Quality Engineering
3 credits, ABCF grading

MEC 585 Total Quality Management
Concepts of TQM and quality improvement methods to attain world-class performance in business operations. Topics include policy deployment, process improvement methodology, daily work management, quality story methodology, six sigma, poka-yoke, ISO, Deming and Baldridge Awards criteria.
Spring, 3 credits, ABCF grading

MEC 591 Industrial Project in Opto Electro Mechanical Systems 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 director and instructor
Fall, 3 credits, ABCF grading

MEC 597 Graduate Research and Study in Manufacturing
Independent research or project in the area of manufacturing processes or systems.
Prerequisite: Students specializing in Manufacturing
1-6 credits, ABCF grading

MEC 599 Research
Fall, spring, and summer, 1-12 credits, S/U grading
May be repeated for credit

MEC 630 Special Topics in Fluid Mechanics
The subject matter of each special topics course varies from semester to semester, depending on the interests of students and staff. Advanced topics and specialized topics will be discussed, particularly those of current interest.
3 credits, ABCF grading
May be repeated for credit

MEC 631 Special Topics in Heat Transfer
The subject matter of each special topics course varies from semester to semester, depending on the interests of students and staff. Advanced topics and specialized topics will be discussed, particularly those of cur-

rent interest.
3 credits, ABCF grading
May be repeated for credit

MEC 632 Special Topics in Statistical Mechanics
The subject matter of each special topics course varies from semester to semester, depending on the interests of students and staff. Advanced topics and specialized topics will be discussed, particularly those of current interest.
3 credits, ABCF grading
May be repeated for credit

MEC 633 Special Topics in Thermodynamics
The subject matter of each special topics course varies from semester to semester, depending on the interests of students and staff. Advanced topics and specialized topics will be discussed, particularly those of current interest.
3 credits, ABCF grading
May be repeated for credit

MEC 634 Advanced Topics in Kinematics and Dynamics of Machines
The subject matter of each special topics course varies from semester to semester, depending on the interests of students and staff. Advanced topics and specialized topics will be discussed, particularly those of current interest.
3 credits, ABCF grading
May be repeated for credit

MEC 635 Advanced Topics in Nonlinear Dynamic Systems
The subject matter of each special topics course varies from semester to semester, depending on the interests of students and staff. Advanced topics and specialized topics will be discussed, particularly those of current interest.
3 credits, ABCF grading
May be repeated for credit

MEC 636 Advanced Topics in Mechanical Vibration
The subject matter of each special topics course varies from semester to semester, depending on the interests of students and staff. Advanced topics and specialized topics will be discussed, particularly those of current interest.
3 credits, ABCF grading
May be repeated for credit

MEC 637 Special Topics in Precision Engineering
The subject matter of each special topics course varies from semester to semester, depending on the interests of students and staff. Advanced topics and specialized topics will be discussed, particularly those of current interest.
3 credits, ABCF grading
May be repeated for credit

MEC 641 Fracture Mechanics
The mechanics of brittle and ductile fracture in engineering materials are studied. Major subjects are linear elastic fracture, elastic-plastic fracture, and fatigue crack analysis. Topics also include stress intensity factor, energy release rate, J-integ.
Prerequisite: MEC 536, MEC 541
Fall or spring, alternate years, 3 credits, ABCF grading

MEC 651 Advanced Finite Element Analysis
Finite element method for the analysis of continuous media. In-depth discussion of penalty method, integration techniques, and differential equation solvers. Computer implementation of finite element code in nonlinear elastic, elastic-plastic materials, and dynamic problems. Major topics are 2-D and 3D element formulations, stress update algorithms, Newton-Raphson iterative technique, and explicit/implicit time integration schemes.
Prerequisites: MEC 541, MEC 539
Fall or spring, alternate years, 3 credits, ABCF grading

MEC 671 Optical Methods for Experimental Stress Analysis
Theory and applications of moire methods (in-plane, shadow, reflection, projection, and refraction moire techniques) for measuring static and dynamic deformation of 2D and 3D models, bending of plates and shells, and temperature distribution or refraction index change in fluids. Other topics: holographic interferometry, laser speckle interferometry, and current research activities of the field.
Fall or spring, alternate years, 3 credits, ABCF grading

MEC 696 Special Problems in Mechanical Engineering
Conducted jointly by graduate students and one or more members of the faculty.
Prerequisite: Advisor's permission
1-6 credits, ABCF grading
May be repeated for credit

MEC 697 Practicum in Teaching I
Every T.A. must register for this course.
Fall, spring, 0 credits, S/U grading

MEC 698 Practicum in Teaching II
Practicum in teaching under faculty supervision.
1-3 credits, S/U grading
May be repeated for credit

MEC 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

MEC 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

MEC 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

MEC 800 Full Time Summer Research
Summer, 0 credits, S/U grading

School of Medicine

Dean: Norman H. Edelman, M.D., Health Sciences Center Level 4, Room 170 (631) 444-2080

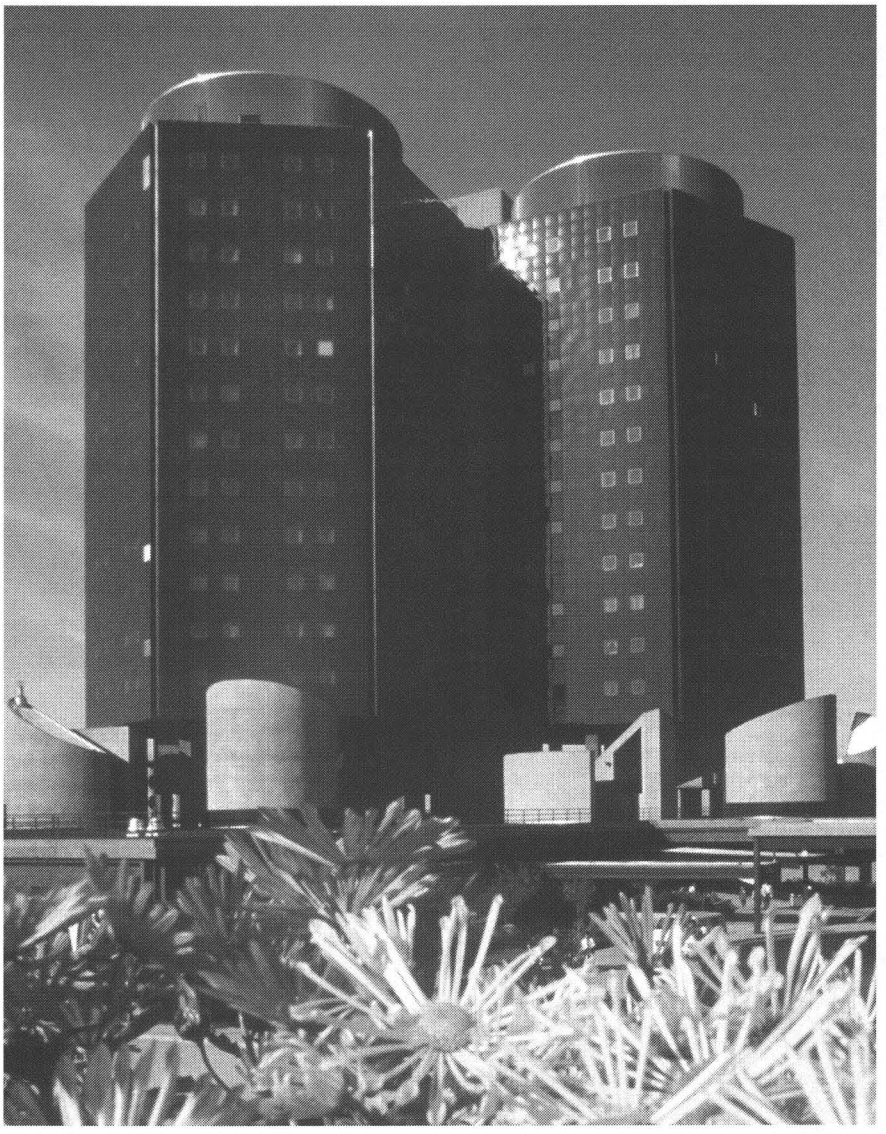
Degree awarded: M.D. in Medicine, M.D./Ph.D

The School of Medicine consists of basic science and clinical departments that have the responsibility for preclinical and clinical instruction of its students, as well as Universitywide responsibility to students in other schools on the campus. Basic science departments include Anatomical Sciences, Biochemistry and Cell Biology, Biomedical Engineering, Molecular Genetics and Microbiology, Neurobiology and Behavior, Oral Biology and Pathology (in conjunction with the School of Dental Medicine), Pathology, Pharmacological Sciences, and Physiology and Biophysics. Clinical departments include the departments of Anesthesiology, Dermatology, Emergency Medicine, Family Medicine, Medicine, Neurological Surgery, Neurology, Obstetrics and Gynecology, Ophthalmology, Orthopaedics, Pediatrics, Preventive Medicine, Psychiatry and Behavioral Science, Radiation Oncology, Radiology, Surgery, and Urology. In addition to instruction at the undergraduate and professional levels, these departments have major responsibility for graduate, postgraduate, and continuing education.

Graduate studies in basic science are closely coordinated with those in the division of biological sciences and are conducted under the general regulations of the Graduate Council and the dean of the Graduate School.

All questions concerning admission to the School of Medicine and requests for the Health Sciences Center Bulletin should be addressed to:

Office of Admissions
School of Medicine
Health Sciences Center
Stony Brook University
Stony Brook, NY 11794-8434
(631) 444-2113



Stony Brook University Hospital

Molecular and Cellular Biology (MCB)

Graduate Program Director: W. Todd Miller, Health Sciences Center, Basic Science Tower, T-6, Room 183 (631) 444-3533
Graduate Program Senior Staff Assistant: Carol Juliano, Life Sciences Building 336 (631) 632-8533

Degree awarded: Ph.D. in Molecular and Cellular Biology

The Molecular and Cellular Biology (MCB) graduate program offers a multidisciplinary course of study leading to the Ph.D. degree. Diverse biological systems of study from plants to humans are pursued in MCB research laboratories. These systems are used to investigate a variety of biological topics including Cancer, Infectious Disease, Gene Expression, Structural Biology, Neurobiology, DNA Replication, Development, Immune Response, Cell Cycle, Protein Trafficking, Signal Transduction, and Biological Membranes. The MCB program provides students with the opportunity to select an academic program in one of three specializations: Molecular Biology and Biochemistry, Cellular and Developmental Biology, or Immunology and Pathology. The goal of this approach is to provide the student with the widest range of research possibilities.

During the first year, students participate in several core courses that serve to build a scholastic foundation for further study. The core courses include Graduate Biochemistry, Molecular Genetics, and Cell Biology. In addition, students receive training to critically evaluate original research articles in a Journal Club/Readings course. Students can select an area of specialization at the time of enrollment or they can decide on a course of study during their first year. The program of study in Molecular Biology and Biochemistry includes Physical Biochemistry and any of a number of electives. Training stresses biochemical and structural approaches to solve biological problems. The program of study in Cellular and Developmental Biology includes a course in Developmental Biology and any of a number of electives. Emphasis is placed on the control mechanisms that define and regulate growing and developing systems. The program of study in Immunology and Pathology includes courses in Immunology and General Pathology. This area of specialization emphasizes the cellular and molecular basis of human disease to foster a bridge between basic and clinical research. Each of the specializations enhances knowledge within the field to ensure our graduates are well equipped for a successful career in research.

The MCB program involves students in ongoing research projects as soon as they arrive on campus. During the first academic year, students train in four different research laboratories to help in choosing a mentor for thesis dissertation. The first laboratory training, or rotation, is usually at Stony Brook University, but subsequent rotations can be performed at Cold Spring Harbor Laboratory or Brookhaven National Laboratory. The MCB program crosses departmental boundaries and institutions to offer the student thesis research training in nearly 100 different laboratories. A decision for a thesis advisor is generally made by the end of the first academic year and research studies will subsequently form the foundation of a Ph.D. thesis.

All students in the MCB program gain experience and skills in teaching and oral presentation of their research studies. During two semesters, students assist in teaching undergraduate laboratory or lecture courses. The teaching experience can include assistance in formulation/grading of examinations and individual tutoring sessions. In the third and subsequent years, graduate students present their research progress to other students and faculty in a seminar forum. The student seminars are an opportunity to gain communication skills and to learn about ongoing research of other students in different laboratories. In addition to student seminars, a number of faculty from outside the institution are invited for weekly seminars. These are opportunities to meet visiting scientists who are leaders in their field and to learn of their latest findings.

In the second year of the MCB program, students take a comprehensive qualifying exam. Following successful performance, students focus on their thesis research. In the third year, students prepare a written Ph.D. thesis proposal in consultation with their faculty thesis advisor. The proposal is defended orally before a proposal committee comprised of faculty selected by the student. Following successful defense of the proposal, the student advances to candidacy and the proposal committee along with the faculty advisor become the student's Ph.D. thesis committee. The Ph.D. thesis committee meets at least once a year with the student to assess progress and discuss research strategies.

For more information, visit the MCB Web site at *life.bio.sunysb.edu/mcb*.

Facilities

The Biological Sciences Division and Health Sciences Center are well equipped for work in developmental and cellular biology. Individual faculty laboratories and central services provide a full array of state-of-the-art equipment. These include the Flow Cytometry Facility, the Cell Culture and Hybridoma Facility, the Transgenic Mouse Facility, the University Microscopy Imaging Center, and the Center for Analysis and Synthesis of Macromolecules. The Health Sciences Library contains a comprehensive collection of biomedical journals and books and is complemented by the Melville Library on the main campus.

Admission

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

A. A bachelor's degree with the following minimal preparation: mathematics through one year of calculus, chemistry (including organic chemistry and laboratory), general physics, and one year of biology (including laboratory);

B. A minimum grade point average of 3.0 (B) in undergraduate courses including science and mathematics courses;

C. Letters from three previous instructors;

D. A report of Graduate Record Examination (GRE) General Test scores;

E. Acceptance by both the Graduate

Program in Molecular and Cellular Biology and the Graduate School.

In special cases, students not meeting requirements A and B may be admitted on a provisional basis. These students must act to remedy deficiencies within the first year according to the program's requirements.

Faculty

Professors

Bar-Sagi, Dafna[2], Ph.D., 1984, Stony Brook University: *Ras* proteins in proliferation and transformation.

Benach, Jorge L.[2], Ph.D., 1972, Rutgers University: Pathogenesis of spirochetal infections; utilization of host macromolecules.

Bingham, Paul M.[1], Ph.D., 1979, Harvard University: Genetic control of development and gene expression in animals.

Bogenhagen, Daniel F.[4], M.D., 1977, Stanford University: Mitochondrial DNA; mitochondrial proteomics.

Chen, Wen-Tien[8], Ph.D., 1979, Yale University: Proteases and integrins in cancer invasion, metastasis, and angiogenesis.

Edmunds, Leland N.[12], Ph.D., 1964, Princeton University: Regulation of cell cycles by circadian oscillators in Euglena.

Fisher, Paul[4], M.D./Ph.D., 1980, Stanford University: Nucleus structure/function; eukaryotic DNA synthesis.

Frohman, Michael A.[4], M.D./Ph.D., 1986, University of Pennsylvania: Signal transduction; membrane vesicle trafficking; regulated exeocytosis; diabetes; phototransduction.

Furie, Martha[5], Ph.D., 1980, Rockefeller University: Interactions among pathogenic bacteria, endothelium, and leukocytes.

Gergen, J. Peter[1], Ph.D., 1982, Brandeis University: Gene expression and development in Drosophila.

Ghebrehiwet, Berhane[8], D.V.M./D.Sc., 1974, University of Paris, France: Biochemistry; function of the complement system.

Grollman, Arthur, P.[4], M.D., 1959, Johns Hopkins Medical School: Mechanisms of chemical mutagenesis/carcinogenesis.

Habicht, Gail[5], Ph.D., 1965, Stanford University: Lyme disease; evolution of cytokines.

Halegoua, Simon[3], Ph.D., 1978, Stony Brook University: Molecular control of the neuronal phenotype.

Hayman, Michael[2], Ph.D., 1973, Institute for Medical Research, England: Viral/cellular oncogenes; differentiation of erythroid cells.

Hearing, Patrick[2], Ph.D., 1980, Northwestern University: Adenovirus-host cell interactions; adenovirus assembly and vectors for gene therapy.

Jesty, Jolyon[8], D.Phil., 1972, University of Oxford, England: Mechanisms of thrombogenesis.

Johnson, Roger A.[6], Ph.D., 1968, University of Southern California, Los Angeles: Intracellular signal transduction.

Katz, Eugene[2,14], Ph.D., 1969, University of Cambridge, England: Genetics/development in cellular slime molds.

Lennarz, William, J., *Chairperson.*[1] Ph.D., 1959, University of Illinois: Biosynthesis and function of glycoproteins in cell-cell interactions.

Levine, Joel M.[3], Ph.D., 1980, Washington University: Cell-surface molecules of the developing nervous system.

London, Erwin[1], Ph.D., 1979, Cornell University: Membrane protein structure/translocation/folding; structure and function of sphingolipid/cholesterol rafts in membranes.

Malbon, Craig C.[4], Ph.D., 1976, Case Western Reserve University: Heterotrimeric G-proteins in development and cancer.

Mandel, Gail[3], Ph.D., 1977, University of California, Los Angeles: Gene expression in the nervous system

Marcu, Kenneth B.[1], Ph.D., 1975, Stony Brook University: Molecular control of innate and adaptive immunity; NF-kappaB kinases and inflammatory response; antibody gene class switch recombination and somatic hypermutation.

McLaughlin, Stuart[6], Ph.D., 1968, University of British Columbia, Canada: Calcium/phospholipid second messenger system.

Miller, Todd W.[6], Ph.D., 1989, Rockefeller University: Tyrosine phosphorylation and signal transduction.

Moll, Ute M.[5], M.D., 1985, Ulm, Germany: The p53 tumor suppressor gene family; Function/regulation in normal cells and tumor-associated inactivation.

Reich, Nancy L.[5], Ph.D., 1983, Stony Brook University: Signal transduction and gene expression in response to cytokines and virus.

Sampson, Nicole[9], Ph.D., 1990, University of California, Berkeley: Protein stucture-function; mammalian fertilization.

Schechter, Nisson[1], Ph.D., 1971, Western Michigan University: Homeobox and filament proteins in neuronal differentiation, growth, and regeneration.

Schmidt, Jakob[1], M.D./Ph.D., 1970, University of California, Riverside: Signal transduction in electrically excitable cells.

Simon, Sanford R.[1,5], Ph.D., 1967, Rockefeller University: Extracellular matrix degradation by inflammatory and tumor cell proteases.

Smith, Steven O.[1], Ph.D., 1985, University of California, Berkeley: Structure and function of membrane proteins.

Steigbigel, Roy T.[8], M.D., 1966, University of Rochester: Immune dysfunction induced by HIV infection.

Sternglanz, Rolf[1], Ph.D., 1967, Harvard University: Chromatin structure and function; histone modifying enzymes; gene expression.

Taichman, Lorne B.[10], M.D./Ph.D., 1971, University of Wisconsin: Cutaneous gene therapy.

Tseng, Linda[11], Ph.D., 1968, University of North Dakota: Reproductive molecular endocrinology.

Williams, David L.[4], Ph.D., 1972, University of Illinois: Cell biology of atherosclerosis and lipoprotein receptors.

Van Nostrand, William E.[8], Ph.D. 1985, University of California, Irvine: Alzheimer's disease and related disorders.

Wimmer, Eckard[2], Ph.D., 1962, University of Gottingen, Germany: RNA virus genetics, replication, and pathogenicity; cellular virus receptors.

Associate Professors

Abumrad, Nada[6], Ph.D., 1978, University at Syracuse: Membrane transport of fatty acid.

Berrios, Miguel[4], Ph.D., 1983, Rockefeller University: Cell biology of DNA damage and repair.

Brown, Deborah[1], Ph.D., 1987, Stanford University: Cholesterol/sphingolipid-rich membrane domains in signal transduction and membrane traffic.

Citovsky, Vitaly[1], Ph.D., 1987, Hebrew University, Israel: Nuclear targeting and intercellular communication in plants.

Dean, Neta[1], Ph.D., 1988, University of California, Los Angeles: Protein glycosylation; fungal cell wall biosynthesis; fungal pathogenesis.

Deutsch, Dale[1], Ph.D., 1972, Purdue University: Molecular neurobiology of anandamide (the endogenous marijuana) regulation.

Fleit, Howard B.[5], Ph.D., 1980, New York University: Leukocyte Fc receptors; macrophage differentiation.

Galanakis, Dennis K.[5], M.D., 1962, University of Saskatchewan, Canada: Biochemistry; physiology of fibrinogen.

Garlick, Jonathan[10], D.D.S., 1985; Ph.D., 1993, Stony Brook University: Oral and epidermal carcinogenesis/cancer gene therapy, tissue engineering.

Haltiwanger, Robert[1], Ph.D., 1986, Duke University: Role of protein glycosylation in signal transduction; notch signaling.

Hod, Yaacov[8], Ph.D., 1977, Israel Institute of Technology, Israel: Hormonal control of gene expression; mRNA turnover.

Holdener, Bernadette[1], Ph.D., 1990, University of Illinois: The role of protein folding in WNT signal transduction and development.

Hollingsworth, Nancy[1], Ph.D., 1988, University of Washington, Seattle: Chromosome structure and function during meiosis in yeast.

Kernan, Maurice[3], Ph.D., 1990, University of Wisconsin: Genetics of mechanosensory transduction in *Drosophila*; differentiation and signaling in ciliated cells; polycystins.

Kew, Richard R.[5], Ph.D, 1986, Stony Brook University: Leukocyte chemotaxis/ inflammation.

Kisker, Caroline[4], Ph.D., 1994, Free University, Berlin, Germany: Structural and functional studies on DNA repair enzymes; DNA polymerases and structure-based drug design.

Konopka, James[2], Ph.D., 1985 University of California, Los Angeles: Hormone signal transduction; yeast cell development.

Lyman, Harvard[1], Ph.D., 1960, Brandeis University: Photocontrol of chloroplast development.

Mackow, Erich R.[8], Ph.D., 1984, Temple University: Hantavirus and Rotavirus Pathogenesis; viral regulations of cell signaling pathways and responses; viral attachment and entry; reverse genetics.

McKinnon, David[3], Ph.D., 1987, John Curtin School of Medical Research, Australia: Molecular physiology of sympathetic neurons and cardiac muscle.

Moriya, Masaaki[4], Ph.D. 1981, Nagoya University, Japan: Cellular responses to DNA damage.

Prives, Joav[4], Ph.D., 1968, McGill University, Canada: Cytoskeletal membrane interactions in muscle cell.

Quitschke, Wolfgang[7], Ph.D.,1983, Stony Brook University: Gene regulation of proteins associated with neurodegenerative diseases.

Rebecchi, Mario J.[8], Ph.D., 1984, New York University: Phospholipases and signal transduction.

Scarlata, Suzanne[6], Ph.D., 1984, University of Illinois: Structure /oligomerization of membrane proteins.

Schindelin, Hermann[1], Ph.D., 1994, Free University Berlin, Germany: Structure and function of proteins involved in ubiquitin-dependent protein degradation and neuroreceptor anchoring.

Spector, Ilan[6], Ph.D., 1967, University of Paris, France: Neuronal differentiation and microfilaments.

Spitzer, Eric D.[5], M.D./Ph.D., 1985, Johns Hopkins University: Molecular biology of Cryptococcus neoformans.

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.

Tonge, Peter J.[9], Ph.D., 1986, University of Birmingham, England: Tuberculosis pathogenesis and drug discovery; enzyme mechanisms and rational inhibitor design; fluorescent proteins.

VanNostrand, William E.[8], Ph.D., 1985, University of California, Irvine: Physiologic and pathophysiologic vascular functions of the Alzheimer's disease amyloid beta-protein precursor.

Zieve, Gary[5], Ph.D., 1977, Massachusetts Institute of Technology: Assembly/transport of snRNP particles.

Assistant Professors

Garlick, Jonathan[10], D.D.S., 1985, Ph.D.; 1993, Stony Brook University: Oral and epidermal carcinogenesis/cancer gene therapy.

Hsieh, Jen-Chih[1], Ph.D. 1994, Duke University: Wnt signaling pathways.

Karzai, Wali[1], Ph.D. 1995, Johns Hopkins University: Translational control of gene expression.

Leatherwood, Janet[2], Ph.D., 1993, Johns Hopkins University: Cell-cycle control and DNA replication; fission yeast molecular biology.

Lin, Richard[6], M.D., 1988, University of California, San Francisco: Signal transduction and cell growth.

Nassar, Nicholas[6], Ph.D., 1992, University Joseph Fourier, Grenoble, France: Crystallographic and biochemical studies of signal proteins.

Neiman, Aaron[1], Ph.D., 1994, University of California, San Francisco: Vesicle trafficking and intracellular signaling in yeast.

Raleigh, Daniel P.[9], Ph.D., 1988, Massachusetts Institute of Technology: Experimental studies of protein folding and amyloid formation.

Simmerling, Carlos[9], Ph.D. 1994, University of Illinois, Chicago: Structure and motion of biomolecules.

Sirotkin, Howard[3], Ph.D., 1996, Albert Einstein College of Medicine: Genetic and molecular analysis of early vertebrate development.

Thanassi, David G.[2], Ph.D. University of California at Berkeley: Virulence factors of pathogenic bacteria.

Tsirka, Styliani-Anna[4], Ph.D., 1989, University of Thessaloniki, Greece: Neuronal-microglial interactions in the physiology and pathology of the central nervous system.

White, Thomas[6], Ph.D., 1994 Harvard University: Molecular biology and physiology of gap junction channels.

Adjunct Faculty

Dunn, John, *Microbiologist.*[13] Ph.D., 1970, Rutgers University: Structure/function of bacteriophage T7 RNA polymerase.

Grewal, Shiv, *Assistant Professor.*[15], Ph.D. 1992, University of Cambridge, England. Gene repression in fission yeast.

Hannon, Gregory, *Professor.*[15] Ph.D., 1992, Case Western Reserve University: Genetics of growth in mammalian cells and dsRNA-induced gene silencing.

Helfman, David, *Professor.*[15] Ph.D., 1981, Emory University: Cytoskeleton organization and function.

Hernandez, Nouria, *Professor.*[15] Ph.D., 1983, University of Heidelberg, Germany:Transcription by mammalian RNA polymerase II and III.

Herr, Winship, *Dean.*[15] Ph.D., 1982, Harvard University: Control of eukaryotic transcription.

Krainer, Adriane, *Professor.*[15] Ph.D., 1986, Harvard University: mRNA splicing; gene expression; RNA-protein interaction.

Lazebnik, Yuri, *Associate Professor.*[15] Ph.D., 1986, St. Petersburg State University, Russia: Molecular mechanisms of apoptosis.

Setlow, Richard, *Professor.*[1,13] Ph.D., 1947, Yale University: DNA damage and repair; carcinogenesis and mutagenesis in fish.

Spector, David L., *Professor.*[15] Ph.D., 1980, Rutgers University: Spatial organization of gene expression.

Stenlund, Arne, *Associate Professor.*[15] Ph.D., 1984, Uppsala University, Sweden: DNA replication of papillomaviruses.

Stillman, Bruce, *Director.*[15] Ph.D., 1979, Australian National University: DNA replication and chromatin assembly in human and yeast cells.

Studier, F. William, *Professor.*[1,13] Ph.D., 1963, California Institute of Technoloy: Phage T7 replication; large-scale nucleotide sequencing.

Tansey, William P., *Associate Professor.*[15] Ph.D., 1991, University of Sydney, Australia: Regulation of oncoprotein stability.

Tonks, Nicholas, *Professor.*[15] Ph.D., 1985, University of Dundee, Scotland: Characterization of protein tyrosine phosphatases.

Van Aelst, Linda, Ph.D., *Associate Professor.*[15] 1991, University of Leuven, Belgium: Role of ras in mammalian cell transformation.

Wigler, Michael, *Professor.*[15] Ph.D., 1978, Columbia University: Genomics and cancer.

Number of teaching, graduate, and research assistantships, fall 2003: 98

1) Department of Biochemistry and Cell Biology

2) Department of Microbiology

3) Department of Neurobiology and Behavior

4) Department of Pharmacological Sciences

5) Department of Pathology

6) Department of Physiology and Biophysics

7) Department of Psychiatry

8) Department of Medicine

9) Department of Chemistry

10) Department of Oral Biology and Pathology

11) Department of Obstetrics and Gynecology

12) Department of Anatomical Sciences

13) Brookhaven National Laboratory

14) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1975

15) Cold Spring Harbor Laboratory

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 semester 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 semester 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 semester 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.
Prerequisite: Matriculation in graduate program or permission of instructor
Fall, 3 credits, ABCF grading
May be repeated for credit

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
Every other 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 dif-

ferent 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.
Prerequisites: MCB 520, or undergraduate physical chemistry course, plus matriculation in gradaute program or permission of instructor
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.
Prerequisite: Matriculation in graduate program or permission of instructor
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.
Prerequisite: Undergraduate biochemistry course, matriculation in graduate program, or permission of instructor
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, 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.
Fall, 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 536 Biological Clocks
An in-depth consideration of the temporal dimension of biological organization and of the cellular and molecular timekeeping mechanisms characteristic of living systems. Topics include a survey of circadian rhythms and their properties in eukaryotic systems, cell cycle clocks, the quest for anatomical loci, dissection of clocks by chemicals and molecular genetic techniques, entrainment and coupling pathways, biochemical and molecular models of circadian oscillators, pacemaker dysfunction, cellular aspects of chronopharmacology and chronotherapy, and cellular clocks in development and aging. This course is offered as HBA 536, MCB 536 and CEB 513. Note: Prior to the start of class, students are advised to contact the instructor via e-mail at *Leland.Edmunds@stonybrook.edu.*
Prerequisite: Matriculation in graduate program or permission of instructor
Spring, 3 credits, ABCF grading

MCB 537 Physiology and Biochemistry of the Cell Cycle
An integrated view of the cell cycle in prokaryotes and eukaryotes. Topics considered include cell cycle anatomy, cell population dynamics, general patterns of biosynthesis, regulation of enzyme activity during the cell cycle, temporal control of gene expression, development and function of cellular organelles during the cell cycle, cell cycle clocks, the cyclin oscillator, the control of cell division, and the role of the cell cycle in cancer, apoptosis, and aging. Note: Prior to the start of class, students are advised to contact the instructor via e-mail at *Leland.Edmunds@stonybrook.edu.*
Prerequisite: Matriculation in graduate program or permission of instructor
Fall, 3 credits, 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, 1 credit, S/U grading
May be repeated once 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
Spring, 1 credit, S/U grading
May be repeated once 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.
Prerequisite: MCB 656, matriculation in graduate program, or permission of instructor
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
0 credits, S/U grading

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: approval from instructor
Fall, 1 credit, S/U 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: Histology, gross anatomy, physiology, and biochemistry; prior or concurrent microbiology; or permission of instructor
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
Fall, 3 credits, ABCF grading

Molecular Genetics and Microbiology (HBM)

Chairperson: Dafna Bar-Sagi, Life Sciences Building 252 (631) 632-9737
Graduate Program Director: James Konopka, Life Sciences Building 168 (631) 632-8715
Graduate Program Coordinator: Robyn Fillinger, 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 occupies one-and-a-half floors of the Life Sciences Building and the second floor of the Centers for Molecular Medicine (CMM), a state-of-the-art research and teaching facility. Approximately 30,000 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 tissue culture and hybridoma facility, microinjection facility, glassware washing facility, analytical equipment lab, protein and nucleic acid sequencing lab, environmental rooms, darkrooms, computer facility, and fermentor facility. Major items of equipment are organized into these central facilities, which are readily available to trainees. The CMM serves as a physical and intellectual bridge between investigators in the 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 250,510 volumes, including more than 4,300 journal titles. Other campus libraries include the Frank Melville Jr. Memorial Library. In addition, the Department of Molecular Genetics and Microbiology maintains its own reading room with a collection of about 1,000 volumes of 13 major journals especially relevant to biological research.

Admission

Predoctoral 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 program are accepted with full support. The current level of support is $23,000 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, *Chairperson.* Ph.D., 1984, Stony Brook University: Role of *ras* oncogenes in cell proliferation; signal transduction.

Bauer, William R., Ph.D., 1968, California Institute of Technology: Structure and function of closed circular DNA.

Benach, Jorge, 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.

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

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., *Graduate Program Director.* Ph.D., 1985, University of California, Los Angeles: Cell growth and development in yeast; pheromone signal transduction.

Marcu, Kenneth[5], Ph.D., 1975, Stony Brook University: Immunoglobulin gene expression and recombination.

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

Associate Professors

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

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

Assistant Professors

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

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

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

Adjunct Faculty

Anderson, Carl W., *Professor.*[1] Ph.D., 1970, Washington University: Cell cycle control and cellular response to DNA damage.

Dunn, John J., *Professor.*[1] Ph.D., 1970, Rutgers University: Transcription, processing, and translation of RNA.

Herr, Winship, *Professor.*[2] Ph.D., 1982, Harvard University: Transcriptional control mechanisms in mammalian cells.

Setlow, Jane K., *Professor.*[1] Ph.D., 1959, Yale University: Recombination and repair of microbial DNA.

Steinberg, Bettie M., *Associate Professor.*[3] Ph.D., 1976, Stony Brook University: Papilloma viruses; cell-virus interactions; viral transformation.

Stillman, Bruce W., *Professor.*[2] Ph.D., 1979, Australian National University: Mechanism of eukaryotic DNA replication.

Studier, F. William, *Professor.*[1] Ph.D., 1963, Caltech: Genetics and physiology of bacteriophage T7; structural genomics.

Research Faculty

Bahou, Wadie[7], M.D., 1980, Massachusetts Medical Center: Human genetics; gene therapy.

Freimuth, Paul, *Associate Biochemist.*[1] Ph.D., 1980, Stanford University: Adenovirus reproduction; virus-cellular receptor binding.

Helfman, David, *Investigator.*[2] Ph.D., 1981, Emory: Molecular basis for tissue-specific alternative RNA splicing; role of cytoskeleton in cellular functions.

Hernandez, Nouria, *Professor.*[2] Ph.D., 1983, Heidelberg, Germany: Transcription initiation and termination in human snRNA genes and HIV-1LTR.

London, Erwin, *Professor.*[8] Ph.D., 1979, Cornell University: Membrane protein folding and lipid interaction.

Lowe, Scott, *Associate Professor.*[2] Ph.D., 1994, Massachusetts Institute of Technology: Apoptosis; anticancer therapy resistance.

Luft, Benjamin, *Professor.*[7] M.D., 1976, Albert Einstein Medical College: Pathobiology of *Borellia* and toxoplasma.

Mackow, Erich R., *Assistant Professor.*[4] Ph.D., 1984, Temple University: Rotavirus and hantavirus pathogenesis.

Miller, Todd[11], Ph.D., 1988, Rockefeller University: Signal transduction by tyrosine kinases.

Moll, Ute[9], *Professor.* M.D., 1985, University of Ulm: Tumor suppressor genes; role of p53 in human cancer.

Reich, Nancy, *Professor.*[9] Ph.D., 1983, Stony Brook University: Control of interferon induced gene expression.

Skowronski, Jacek, *Associate Professor.*[2] Ph.D., 1981, Lodz University: HIV genes and signal transduction in T cells.

Stenlund, Arne, *Associate Professor.*[2] Ph.D., 1984, Uppsala University, Sweden: DNA replication of bovine papillomavirus.

Spitzer, Eric, *Associate Professor.*[7] M.D., Ph.D., 1985, Johns Hopkins University: Molecular biology of microbial pathogens.

Steigbigel, Roy, *Professor.*[7] M.D., 1966, University of Rochester School of Medicine: Treatment of HIV infection.

Tonge, Peter J., *Assistant Professor.*[10] Ph.D., 1986, University of Birmingham: Enzyme mechanisms and rational drug design.

Tonks, Nicholas, *Professor.*[2] Ph.D., 1985, University of Dundee: Post-translational modification; phosphorylation and phosphatases.

Wigler, Michael, *Professor.*[2] Ph.D., 1978, Columbia University: Signal transduction and growth control in eukaryotes.

Number of teaching, graduate, and research assistants, fall 2003: 39

1) Brookhaven National Laboratory

2) Cold Spring Harbor Laboratory

3) Long Island Jewish Hospital

4) Joint appointment, Department of Medicine

5) Joint appointment, Department of Biochemistry and Cell Biology

6) Joint appointment, Department of Pharmacology

7) Department of Medicine

8) Department of Biochemistry and Cell Biology

9) Department of Pathology

10) Department of Chemistry

11) Department of Physiology and Biophysics

Degree Requirements

Requirements for the Ph.D. Degree in Molecular 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, and Pharmacology, and from two outside institutions, Cold Spring Harbor Laboratory and Brookhaven National Laboratory. 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 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 outstanding 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 (lab rotations)

HBM 690 Microbiology Seminar

HBM 691 Readings in Microbiology Literature

MCB 517 Biomembranes

GRD 500 Integrity in Science

BSB 515 Computational Methods in Biochemistry and Structural Bioogy

Spring

BGE 510 Graduate Genetics

HBM 522 Biology of Cancer (alternate years)

MCB 656 Cell Biology

HBM 510 Experimental Microbiology (lab rotations)*

HBM 690 Microbiology Seminar

Teaching Assistantship

**Students rotate through three to four 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 thesis research.

Second Year

Fall

HBM 640 Microbial Pathogenesis

HBP 533 Immunology

HBM 599 Graduate Research

HBM 690 Microbiology Seminar

HBM 691 Readings in Microbiology Literature

Teaching Assistantship

Spring

HBM 522 Biology of Cancer (alternate years)

HBM 599 Graduate Research

HBM 690 Microbiology Seminar

B. Comprehensive (Preliminary) Examination

At the end of the third semester, the student will take a written comprehensive (preliminary) examination covering all areas of the prescribed course of study.

C. Thesis Proposal Examination

In the fall semester of the third year, each student submits a written proposal of his or her thesis research (using the format of National Institutes of Health grant proposals), and orally defends that proposal before his or her thesis committee shortly thereafter.

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. Attendance and Participation in Student Seminar

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

F. Ph.D. Dissertation

The research for the Ph.D. dissertation is conducted under the supervision of the thesis 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 examining committee and 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 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.
Prerequisite: Matriculation in graduate program or permission of instructor
Fall, 3 credits, ABCF grading
May be repeated for credit

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.
Prerequisites: Matriculation in a graduate program and permission of the graduate studies director and the lab director
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.
Prerequisites: Matriculation in a graduate program and permission of the graduate studies director and the lab director
Spring, 1-8 credits, S/U grading

HBM 511 Introduction to Biophysical Chemistry
Introduces the chemical principles and techniques needed for the study of biological macromolecules. Topics to be covered include solution chemistry, chemical thermodynamic, binding and dissociation equilibrium, denaturation phenomena, spectroscopy, and hydrodynamics. This course is intended to prepare non-chemistry majors for more advanced work in biophysics.
3 credits, ABCF grading
May be repeated for credit

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.
Prerequisite: Permission of instructor; matriculation as a Stony Brook medical or dental student
Fall, 1-4 credits, ABCF grading
May be repeated for credit

HBM 599 Graduate Research Microbiology
Original investigations under faculty supervision.
Prerequisite: Permission of instructor
Fall and spring, 1-9 credits, ABCF grading

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 bacterial 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 courses is directed to graduate students, post-doctorate and medical fellows, and advanced medical students, who are 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.
Prerequisite: Permission of instructor
Fall and spring, 1 credit, S/U grading

HBM 691 Readings in Microbiology Literature
Readings in microbiology literature covering areas of molecular biology and genetics.
Prerequisite: Permission of instructor
Fall, 1 credit, ABCF grading
May be repeated for credit

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 800 Full-Time Summer Research
Full-time laboratory research projects supervised by staff members.
Prerequisites: Permission of instructor and full-time graduate student status
0 credits, S/U grading

Music (MUS)

Chairperson: Judith Lochhead, Staller Center 3310 (631) 632-7330
Graduate Program Director: Daniel Weymouth, Staller Center 3307 (631) 632-7330
Graduate Program Coordinator: Kathryn Meyler, Staller Center 3304 (631) 632-7330

Degrees awarded: M.A. in Music; M.M. in Music Performance; D.M.A. in Music; Ph.D. in Music

The Department of Music offers programs leading to the Master of Arts degree and the Doctor of Philosophy degree with graduate programs in Music History and Theory and in Composition. The department also offers programs leading to the Master of Music degree in music performance and the Doctor of Musical Arts degree with a concentration in performance. In each of these programs, a special emphasis on the music of the 20th century reflects one aspect of the department's philosophy. 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, the decision whether to pursue the D.M.A. or the Ph.D. degree will depend upon the balance of emphases in the intended program of study.

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 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, 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 emedia 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 some Renaissance wind instruments.The music library contains an extensive research collection of books, periodicals, scores, microfilms, and recordings, and includes an excellent listening facility.

Admission

Admission to the M.A. Program

The following are required for admission to the Graduate program in Music History and Theory, and in Composition leading to an M.A. 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 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 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. Program

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 late each fall. These dates, as well as specific requirements for auditions, are posted at the departmental Web site. The audition in harpsichord will include continuo realization;

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

E. 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 D.M.A. Program

See Admission to the M.M. 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 January and February, are announced by the department late each fall. These dates, as well as specific requirements for auditions, are posted at the departmental Web site. 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 graduate-level music history or music theory, such as papers completed as coursework in either area.

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, 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 a master's degree is required for admission to the department's doctoral programs, successful completion of the Stony Brook M.M. degree does not guarantee acceptance into the D.M.A. program. Students currently enrolled in one of the department's master's programs who wish to pursue doctoral work in the department must announce application in a formal letter, which should reach the graduate program director by January 15 for fall admission. The application should be accompanied by letters of recommendation and examples of work where pertinent. A personal audition is required.

Admission to the Ph.D. Program

See Admission to the M.A. 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: 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, above. 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.

Although a master's degree is required for admission to the department's doctoral programs, successful completion of the Stony Brook M.A. degree does not guarantee acceptance into the Ph.D. program. Students currently enrolled in one of the department's master's programs who wish to pursue doctoral work in the department must announce application in a formal letter, which should reach the graduate program director by January 15 for fall admission. The application should be accompanied by appropriate examples of work and letters of recommendation.

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. Program. Any remedial work must be completed by the end of the first year of study.

Faculty

Professors

Auner, Joseph, *Editor, Journal of the American Musicological Society.* Ph.D., 1991, University of Chicago: Schoenberg; atonal theory and sketch studies; interdisciplinary studies in turn-of-the-century Vienna, Munich, and Berlin; exoticism; contemporary cross-cultural music.

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

Eddy, Timothy, *Emeritus. Member, Orion String Quartet.* M.M., 1970, Manhattan School of Music; pupil of Bernard Greenhouse: Cello; cello repertory; chamber music.

Fuller, Sarah[1], Ph.D., 1969, University of California, Berkeley: Medieval and Renaissance music; history of music theory.

Gosman, Lazar, *Emeritus.* Diploma, 1949, Moscow State Conservatory, Russia; pupil of David Oistrakh: Violin; orchestral conducting.

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.

Layton, Billy Jim, *Emeritus.* Ph.D., 1960, Harvard University: Composition; analysis.

Lessard, John, *Emeritus.* Diploma, 1940, Ecole Normale, France; Diploma, 1941, Longy School of Music: Composition; tonal counterpoint and fugue.

Lochhead, Judith, *Chairperson.* 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.

Robbins, Joyce, *Emerita.* B.S., Juilliard School of Music; pupil of Ivan Galamian; M.A., Columbia University: Violin; violin repertory.

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

Winkler, Peter[2], M.F.A., 1967, Princeton University: Composition; theory and history of popular music.

Associate Professors

Goldstein, Perry[3], *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, Jane[4], Ph.D., 1993, University of California, Los Angeles: Ethnomusicology; musics of Southeastern Europe and the Middle East; gender issues.

Weymouth, Daniel, *Graduate Program Director, 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.

Kawabata, Maiko, Ph.D., 2001, University of California, Los Angeles: 19th-century music; gender studies.

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

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.

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

Gilbert, Daniel, M.M., 1988, Juilliard School: Clarinet; chamber music.

Kavafian, Ani, M.S., 1972, Juilliard School: Violin; chamber music.

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

Morelli, Frank, D.M.A., 1980, Julliard School: Basoon; 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; pupil of Forrest Standley and James Chambers: Horn; chamber music.

Setzer, Philip, M.M., 1974, Juilliard School; Mus.D., 1995, Middlebury College: Violin; 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, pupil of Sophocles Papas: Guitar; lute.

Wincenc, Carol, M.M., 1972, Julliard 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 (see above)

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 2003: 67

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

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.

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, 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, taken at the end of the second year.

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, or Italian 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, 507, or a course from the group MUS 441-478) and one course in music theory (MUS 502, 504, 508, 515, 517, 521, or a course from the group MUS 432, 434, and 439). 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.

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 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.

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 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, usually at the end of the first year, but in any case not in the same semester as the degree recital.

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

E. Foreign Language

A reading knowledge of French or German is required of students in harpsichord. The requirement is satisfied by taking and passing the Music Department's foreign language exam. Harpsichordists who who fail the examination must retake the examination after demonstrating evidence of formal preparation (such as a course or private tutoring). Entering students in voice are expected to have a basic proficiency equivalent to one year each of college-level Italian, French, and German. Deficiencies must be remedied before the degree will be granted.

F. Masters

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

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 five semesters 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 K 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 confering 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-Century Music

The recitals, described above in section C, 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 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 taking 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.

Harpsichord students must demonstrate a reading knowledge of any two of the following languages: French, German, or Italian. Reading knowledge is determined solely by the Music Department Translation Exam.

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 peri-

od 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.

International students whose native language is not English, except those in the D.M.A. programs in harpsichord and voice, may satisfy the language requirement by demonstrating proficiency in English as a second language. Students should consult with the graduate program director about this option.

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

F. Teaching

A minimum of two semester-long courses, or the equivalent, which may comprise individual lessons, ensemble coaching, or classroom teaching, is required.

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 593 Contemporary Chamber Players, or MUS 568 Jazz Ensemble. Students in the choral conducting program should fulfill this requirement by conducting chamber music (see Professor Tim Mount for details).

J. Secondary Area of Specialization

Students who propose to do advanced work in composition, history, or theory 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 L.

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), completion of any remaining language requirement (see Requirement E), and approval of the D.M.A. research essay by the course instructor and the student's directing committee (see Requirement B).

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.

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.

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 one or a combination of the following ways:

1. The presentation of a number of musical compositions demonstrating fluency in working with a variety of contemporary performance media.

2. 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.

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

4. A public colloquium. For historians and theorists, 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 and 21st centuries. 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 Contemporary Music

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

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

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

In order to satisfy the requirement, composers must complete both the essay and the colloquium. Historians and theorists 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 or theory is required; reading knowledge of French, German, or Italian for composition students 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 directing committee and 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 and must present to the seminar at least one project or report.

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, the examination will be focused on a detailed prospectus and bibliography for the dissertation. For composers, this 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.

Courses

MUS 500 Introduction to Music Research
Team-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 Century
An intensive course in 20th-century 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 20th-Century Music
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 repertories 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 nationalsim, 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, 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.
Fall or 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. Not more than eight credits of MUS 507, 508, and 509 combined may be counted toward the degree.
Prerequisite: Audition
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.
Fall or 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.
Prerequisite: Permission of instructor
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.
Prerequisite: MUS 515 or the equivalent
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 music notation software. There is a brief survey of the history, literature and repertoire of the field.
Prerequisite: Music major or permission of instructor
Spring, 3 credits, ABCF grading

MUS 518 Advanced Projects in Computer Music
Advanced projects, individual or collaborative, in computer music.
Prerequisite: MUS 517 and permission of instructor
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.
Fall or spring, alternate years, 3 credits, ABCF grading

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.
Fall or 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.
Fall or spring, alternate years, 3 credits, ABCF grading

Special Topics Courses (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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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.
Fall or 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, and the string quartet since 1945.
Fall or 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.
Prerequisite: Instructor consent
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 repertory, 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 repertories of the respective groups, with particular attention given to the music of the 20th century.
Required: Presence at coaching sessions, at least three hours per week of uncoached rehearsal, and at least one performance per semester
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.
Fall or 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 repertories. 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 repertory: 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.
Prerequisite: Piano major or strong keyboard background
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.
Fall or 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 repertories.
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 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 nonprofessionals; 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 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 20th-century music 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.
Prerequisite: Permission of instructors
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.
Prerequisite: MUS 516 or equivalent
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 activites 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.
Prerequisite: MUS 502, 503, 504, 507, 535, 537-555, 557, or 559
Fall and spring, 1-2 credits, ABCF grading
May be repeated for credit

MUS 696 Doctoral Colloquium
The preparation of a colloquium (Ph.D.) or lecture-recital (D.M.A.) on a musical topic of historical or analytical interest, to be delivered to the department. The instructor, chosen in consultation with the directing committee, acts as an advisor, and oversees the preparation of the prospectus (a plan of research with bibliography) and Abstract (an outline of the presentation), both of which documents must be submitted to the Graduate Studies Committee for approval. Students enroll in MUS 696 in the semester in which the colloquium or lecture-recital is 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, 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, 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.
0 credits, S/U grading

MUS 850 Summer Teaching
Students who receive support for summer teaching must register for this course, which gives them full-time status.
0 credits, S/U grading

Neuroscience (BNB)

Chairperson: Lorne Mendell, Life Sciences Building 550 (631) 632-8616
Graduate Program Director: Gary Matthews, Life Sciences Building 550 (631) 632-8616
Graduate Administrator: Barbara Mummers, 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, Psychology Building, 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 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 and physics, inorganic chemistry, organic 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[4], Ph.D., 1976, University of Illinois: Electrotonic synapses.

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

Fetcho, Joseph, Ph.D., 1985, University of Michigan: Motor control; neural networks in spinal cord.

Goldgaber, Dmitry Y.[5], Ph.D., 1979, Institute of Poliomyelitis, Academy of Medical Sciences, Moscow, USSR: Alzheimer's; Downs Syndrome; aging.

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.

McLaughlin, Stuart[4], Ph.D., 1967, University of British Columbia, Canada: Biophysics of signal transduction.

Morin, Lawrence P.[5], Ph.D., 1974, Rutgers University: Neural control of mammalian circadian rhythms.

Sherman, S. Murray, Ph.D., 1969, University of Pennsylvania: Structure and function of the visual system.

Whitaker-Azmitia, Patricia[6], Ph.D., 1979, University of Toronto: Serotonin in development and plasticity.

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

Associate Professors

Anderson, Brenda J.[6], Ph.D., 1993, University of Illinois: Neuroanatomical and metabolic plasticity.

Evinger, Marian J.[2], Ph.D., 1978, University of Washington: Neural regulation of gene expression.

Frohman, Michael[3], Ph.D., M.D., 1985, University of Pennsylvania: Regulation of exocytosis and cell shape by signaling proteins.

Gnadt, James W., Ph.D., 1985, University of Alabama, Birmingham: Brain mechanisms of eye movement behavior.

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

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

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

Robinson, John K.[6], Ph.D., 1991, University of New Hampshire: Psychopharmacology of learning and memory.

Solomon, Irene C.[4], Ph.D., 1994, University of California, Davis: Neural control of respiratory and cardiovascular function.

Assistant Professors

Khalsa, Partap S.[1], D.C., Ph.D., 1995, Worcester Polytechnic Institute; University of Massachusetts Medical School: Physiology of touch; proprioception; pain.

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

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

Adjunct Faculty

Brody, Carlos[8], Ph.D., 1998, California Institute of Technology: Computational systems neuroscience.

Chklovskii, Dmitri[8], Ph.D., 1994, Massachusetts Institute of Technology: Theoretical neuroscience; principles of brain design.

Cline, Hollis[8], 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, Grigori[8], Ph.D., 1978, Academy of Science, Russia: Nitric oxide; neuron differentiation; survival.

Gatley, S. John[7], Ph.D., 1975, University of Newcastle-upon-Tyne: Neuroimaging; neurochemistry and pharmacology of drug abuse.

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

Huang, Z. Josh[8], Ph.D., 1994, Brandeis University: Development and plasticity of the neocortical GABAergic circuits.

Mainen, Zachary[8], Ph.D., 1995, University of California, San Diego: Neural coding and computations underlying rodent olfactory-guided behavior.

Malinow, Roberto[8], 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, Karel[8], Ph.D., 1994, Harvard University: Synapses; neocortical circuits and their plasticity.

Tully, Timothy[8], Ph.D., 1981, University of Illinois: Genetics of memory formation in Drosophila.

Yin, Jerry[8], Ph.D., 1986, University of Wisconsin: Genetics of memory.

Zador, Anthony[8], M.D., Ph.D., 1994, Yale University: How does the cortex solve the cocktail party problem.

Zhong, Yi[8], Ph.D., 1991, University of California, Berkeley: Molecular control of neuronal plasticity.

Number of teaching, graduate, and research assistants, fall 2003: 42

1) Primary appointment with Department of 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 a M.A. degree. In exceptional instances, a student already in the graduate program may be awarded a 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. Basic Biology (at least one course)

a. Biochemistry (MCB 520). This requirement can be waived if the student can demonstrate that a sufficient course has been successfully completed.

b. Cell Biology (BCD 657). This requirement can be waived if the student can demonstrate that a sufficient course has already been taken.

2. Laboratory in Neuroanatomy (BNB 560). This course consists of a series of laboratory experiments and supplemental lectures providing an overview of the structural organization of the nervous system.

3. Core courses in neuroscience (BNB 561, BNB 562, BNB 563, BNB 564). A four-semester series taught by members of the Department of Neurobiology and Behavior; 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.

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

5. Neurobiological Techniques (BNB 552). This course is a series of laboratory exercises designed to introduce first-year students to the basic investigative techniques of neurobiology. It provides hands-on experience in areas such as cellular physiology, molecular and developmental biology, and integrative neuroscience.

6. 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

During the second year of study, each student must take the comprehensive examination. The examination consists of essay questions in each of the three major subdivisions of neuroscience: molecular, cellular, and integrative neuroscience.

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 preliminary 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. By the end of the second year, the student should initiate a dissertation research program in the laboratory of a member of the program. After consultation with an advisory committee appointed to guide the dissertation research, the student should present and defend a dissertation proposal. 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. Research (BNB 599 and 699) is graded on a satisfactory/unsatisfactory basis. Any student who receives a grade of U in two concurrent semesters will be terminated 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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
Fall and spring, 1-3 credits, S/U 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 neurobiology and behavior or permission of instructor
Fall, every year, 2 credits, ABCF grading

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.
Prerequisities: BIO 334 or equivalent and permission of instructor
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.
Prerequisite: BIO 334 or equivalent and permission of instructor
Fall, 4 credits, ABCF grading

BNB 562 Introduction to Neurobiology and Behavior II
This is 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 Neurobiology and Behavior II
Spring

BNB 579 Developmental Neurobiology
An introduction to the development of the nervous system. Topics include neuroembryology, neuoronal differentiation, synapse formation, and specificity and plasticity of connections in vertebrates and invertebrates. Co-scheduled with BIO 379.
Prerequisite: Permission of instructor
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: Lenora J. McClean, Health Sciences Center Level 2, Room 236 (631) 444-3549

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 Practitioner; Advanced Graduate Certificate as a Psychiatric/Mental Health Nurse Practitioner; Advanced Graduate Certificate as a Family Health Nurse Practitioner
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 Psychiatric/Mental Health Nursing; M.S. in Family Health Nursing
Offered via computer-mediated distance education program: Undergraduate: Registered Nurse Basic Baccalaureate Program; Graduate: Neonatal Health Nursing; Child Health Nursing; Family Health Nursing; Adult Health Nursing; Psychiatric and Mental Health Nursing; Nurse Midwifery

The School of Nursing, within the Health Sciences Center, offers a graduate program leading to the Master of Science degree. The graduate program offers clinical specialization and prepares graduates for the multifaceted role of nurse practitioner/clinical specialist or nurse midwife, in preparation for lifelong learning and professional advancement. Research is a vital element of the program. Graduates are ready to assume the management, education, and consultation responsibilities of senior clinical positions.

Certified nurse midwives and Certified Nurse Practitioners may apply to a Master's Completion Program in their specialty.

Further information may be obtained from:
Philip Tarantino, Ph.D., R.N.
Assistant Dean for Student Affairs
School of Nursing
Health Sciences Center
Stony Brook University
Stony Brook, NY 11794-8240
(631) 444-3200

Oral Biology and Pathology (HDO)

Chairperson: Israel Kleinberg, Westchester Hall 195 (631) 632-8923
Graduate Program Director: Dr. Jerry Pollock, Westchester Hall 101 (631) 632-8923, Fax (631) 632-9704, E-mail: *Jerry.Pollock@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.-Advanced Educational General Dentistry Certificate. Programs of study are also available to individuals with a Ph.D. or a clinical degree (dental or medical) desiring further postdoctoral 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; sebacyte 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 microorgan-

isms; significance of secretory IgA in caries prevention.

Pollock, Jerry J., *Graduate Program Director.* 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.

Simon, Marcia, *Director of Living Skin Bank.* Ph.D., 1981, Brandeis University: Biology and biochemistry of epithelial cornification; epithelial graft therapy for thermal injury; metabolism of vitamin A; sebacyte biology; 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 erythematosis.

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.

Wolff, Mark, D.D.S., 1981, Ph.D., 1997, Stony Brook University: Mechanism and measurements of reduced salivary secretions; understanding dentinal sensitivity and application of therapeutic regimes at the clinical level; early carious lesions; dental material sciences.

Associate Professors

Garlick, Jonathan A., D.D.S., 1985, Ph.D., 1993, Stony Brook University; Cert. Oral Pathology, 1994, Long Island Jewish Medical Center: Mechanisms of oral and epidermal carcinogenesis; wound healing response of oral and epidermal keratinocytes; roles of cell-cell and cell-matrix adhesion in cancer; epithelial gene therapy.

Ryan, Maria E., D.D.S., 1989, Ph.D. 1998, Stony Brook University; Cert. Peridontology, 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.

Assistant Professors

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).

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.

Clinical Adjunct Faculty

Cooper, Barry, D.D.S.

Cutler, Christopher, D.D.S.

Goren, Arthur, D.D.S.

Kittay, Irving, D.D.S.

Phelan, Joan, D.D.S.

Westbay, George, D.D.S.

Xu, Ling, D.D.S., Ph.D.

Research Faculty

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.

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 startified sqamous 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.
Prerequisitss: 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 once 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 four times for credit

HDO 690 Oral Biology and Pathology Seminars
Research seminars by students, staff, and visiting scientists.
Prerequisites: Permission of insructor; 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, 9 credits, ABCF grading
May be repeated for credit

HDO 805 Summer Research
Prerequisite: Admission to graduate Health Sciences Center program
0 credits, S/U grading

Pathology (HBP)

Chairperson: Jay L. Bock, Health Sciences Center BHS T-9, Room 140 (631) 444-3000
Graduate Program Director: W. Todd Miller, Health Sciences Center, Basic Science Tower, T-6, Room 183 (631) 444-3533
Graduate Program Secretary: Carol Juliano, Life Sciences Building 550 (631) 632-8616

Degree awarded: Ph.D. in Molecular and Cellular Pathology

The Department of Pathology, in the Health Sciences Center, offers a graduate program leading to the Ph.D. degree. This program is a specialization within a larger "umbrella" program in Molecular and Cellular Biology, which also offers specializations in Molecular Biology and Biochemistry and Cellular and Developmental Biology. Students are admitted to the umbrella program and choose a specialization at the end of the first year. The goal of this approach is to provide incoming students with the largest possible choice of research opportunities.

The Immunology and Pathology specialization provides a unique, interdisciplinary approach to experimental pathology, with emphasis on the cellular and molecular bases of human disease. The faculty is derived from the Pathology Department and other basic science and clinical science departments. Research training is available in a broad range of areas, including cancer biology, immunology, inflammation, hemostasis, and infectious disease. The program is designed to instill mastery of the methodologies and philosophy of modern cellular and molecular biology, while retaining a practical orientation toward understanding specific disease processes. Graduates of the program will be equipped with the knowledge and skills to bridge the gap between basic and clinical research as they continue in their careers.

In the first year of study, students take comprehensive "core" courses in biochemistry, molecular biology, and cell biology. They are also given the opportunity to pursue research in four different laboratories to help in choosing a mentor for their dissertation work, a decision that is generally made by the end of the first academic year. In the second year, students who elect to specialize in Immunology and Pathology take advanced courses in these subjects and continue to develop their dissertation research projects. A student is advanced to candidacy for the Ph.D. degree after successfully defending his or her dissertation research proposal before a committee comprised of at least four faculty members. This committee continues to meet with the student on a regular basis to review progress and provide guidance. The numerous formal and informal interactions among faculty in the program ensure that each student receives an individualized yet well-rounded education of the highest quality.

Further details about the program and applications for admission may be obtained from the graduate program secretary.

Facilities

Together, individual faculty laboratories, the Pathology Department, the Health Sciences Center, and the Division of Biological Sciences provide a full array of up-to-date equipment and services needed for research in molecular and cellular biology. These include the Flow Cytometry Facility, the Cell Culture and Hybridoma Facility, the Transgenic Mouse Facility, the University Microscopy Imaging Center, and the Center for Analysis and Synthesis of Macromolecules. The Health Sciences Library contains a comprehensive collection of biomedical journals and books and is complemented by the main Melville Library on campus. The Pathology Department also provides students with access to a networked computer system for word processing, data analysis, preparation of graphics and slides, and searches of biomedical databases.

Admission

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

A. A bachelor's degree with the following minimal preparation: mathematics through one year of calculus; chemistry, including organic chemistry; general physics; and one year of biology, including laboratory;

B. A minimum grade point average of 3.0 (B) in undergraduate courses including science and mathematics courses;

C. Letters from three instructors;

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

E. Acceptance by both the Department of Pathology and the Graduate School.

In special cases, students not meeting requirements A and B may be admitted on a provisional basis. These students must act to remedy deficiencies within the first year.

Faculty

Professors

Bar-Sagi, Dafna[2], PhD., 1984, Stony Brook University: *Ras* proteins in proliferation and transformation.

Benach, Jorge L.[2], Ph.D., 1972, Rutgers University: Pathogenesis of spirochetal infections; utilization of host macromolecules.

Bingham, Paul M.[1], Ph.D., 1979, Harvard University: Genetic control of development and gene expression in animals.

Bogenhagen, Daniel F.[4], M.D., 1977, Stanford University: Mitochondrial DNA; DNA repair.

Chen, Wen-Tien[8], Ph.D., 1979, Yale University: Proteases and integrins in cancer invasion, metastasis, and angiogenesis.

Edmunds, Leland N.[12], Ph.D., 1964, Princeton University: Regulation of cell cycles by circadian oscillators in Euglena.

Fisher, Paul[4], M.D./Ph.D., 1980, Stanford University: Nucleus structure/function; eukaryotic DNA synthesis.

Furie, Martha[5], Ph.D., 1980, Rockefeller University: Interactions between leukocytes and endothelium.

Gergen, J. Peter[1], Ph.D., 1982, Brandeis University: Gene expression and development in Drosophila.

Ghebrehiwet, Berhane[8], D.V.M./D.Sc., 1974, University of Paris, France: Biochemistry; function of the complement system.

Grollman, Arthur, P.[4], M.D., 1959, Johns Hopkins Medical School: Mechanisms of chemical mutagenesis/carcinogenesis.

Habicht, Gail[5], Ph.D., 1965, Stanford University: Lyme disease; evolution of cytokines.

Halegoua, Simon[3], Ph.D., 1978, Stony Brook University: Molecular control of the neuronal phenotype.

Hayman, Michael[2], Ph.D., 1973, Institute for Medical Research, England: Viral/cellular oncogenes; differentiation of erythroid cells.

Jesty, Jolyon[8], D.Phil., 1972, University of Oxford, England: Regulatory controls of blood coagulation.

Johnson, Roger A.[6], Ph.D., 1968, University of Southern California, Los Angeles: Intracellular signal transduction.

Katz, Eugene[2,14], Ph.D., 1969, University of Cambridge, England: Genetics/development in cellular slime molds.

Lennarz, William, J., *Chairperson.*[1] Ph.D., 1959, University of Illinois: Biosynthesis and function of glycoproteins in cell-cell interactions.

Levine, Joel M.[3], Ph.D., 1980, Washington University: Cell-surface molecules of the developing nervous system.

London, Erwin[1], Ph.D., 1979, Cornell University: Membrane protein structure/translocation/folding.

Malbon, Craig C.[4], Ph.D., 1976, Case Western Reserve University: Heterotrimeric G-proteins in development and cancer.

Mandel, Gail[3], Ph.D., 1977, University of California, Los Angeles: Gene expression in the nervous system.

Marcu, Kenneth B.[1], Ph.D., 1975, Stony Brook University: Antibody gene class switch regulation; NFkB kinases, and inflammatory responses.

McLaughlin, Stuart[6], Ph.D., 1968, University of British Columbia, Canada: Calcium/phospholipid second messenger system.

Moll, Ute M.[5], *Graduate Program Director.* M.D., 1985, Ulm, Germany: The p53 tumor suppressor gene family: Function/regulation in normal cells and tumor-associated inactivation.

Reich, Nancy L.[5], Ph.D., 1983, Stony Brook University: Signal transduction and gene expression in response to cytokines and virus.

Schechter, Nisson[1], Ph.D., 1971, Western Michigan University: Homeobox and filament proteins in neuronal differentiation, growth and regeneration.

Schmidt, Jakob[1], M.D./Ph.D., 1970, University of California, Riverside: Signal transduction in electrically excitable cells.

Simon, Sanford R.[1,5], Ph.D., 1967, Rockefeller University: Extracellular degradation by neutrophil proteases.

Smith, Steven O.[1], Ph.D., 1985, University of California, Berkeley: Structure and function of membrane proteins.

Steigbigel, Roy T.[8], M.D., 1966, University of Rochester: Immune dysfunction induced by HIV infection.

Sternglanz, Rolf[1], Ph.D., 1967, Harvard University: Chromatin structure and function; gene expression; histone acetyltransferases.

Taichman, Lorne B.[10], M.D./Ph.D., 1971, University of Wisconsin: Cutaneous gene therapy.

Tseng, Linda[11], Ph.D., 1968, University of North Dakota: Reproductive molecular endocrinology.

Williams, David L.[4], Ph.D., 1972, University of Illinois: Cell biology of atherosclerosis and lipoprotein receptors.

Van Nostrand, William E.[8], Ph.D. 1985, University of California, Irvine: Alzheimer's disease and related disorders.

Wimmer, Eckard[2], Ph.D., 1962, University of Gottingen, Germany: RNA virus genetics, replication, and pathogenicity; cellular virus receptors.

Associate Professors

Abumrad, Nada[6], Ph.D., 1978, University at Syracuse: Membrane transport of fatty acid.

Berrios, Miguel[4], Ph.D., 1983, Rockefeller University: Nuclear polypeptide domains, structure, and function.

Brown, Deborah[1], Ph.D., 1987, Stanford University: Cholesterol/sphingolipid-rich membrane domains in signal transduction and membrane traffic.

Citovsky, Vitaly[1], Ph.D., 1987, Hebrew University, Israel: Nuclear targeting and intercellular communication in plants.

Dean, Neta[1], Ph.D., 1988, University of California, Los Angeles: Membrane enzymes involved in glycosylation; yeast molecular genetics; fungal pathogenesis

Deutsch, Dale[1], Ph.D., 1972, Purdue University: Molecular neurobiology of anandamide hydrolase (the endogenous marijuana).

Engebrecht, JoAnne[4], Ph.D., 1986, University of California, San Diego: Meiosis and cellular signaling.

Fleit, Howard B.[5], Ph.D., 1980, New York University: Leukocyte Fc receptors; macrophage differentiation.

Frohman, Michael A.[4], M.D./Ph.D., 1986, University of Pennsylvania: Early mammalian development; gene regulation.

Galanakis, Dennis K.[5], M.D., 1962, University of Saskatchewan, Canada: Biochemistry; physiology of fibrinogen.

Haltiwanger, Robert[1], Ph.D., 1986, Duke University: Glycobiology; biosynthesis, structure, and function of the carbohydrates on glycoproteins.

Hod, Yaacov[8], Ph.D., 1977, Israel Institute of Technology, Israel: Hormonal control of gene expression; mRNA turnover.

Holdener, Bernadette[1], Ph.D., 1990, University of Illinois: Genetic regulation of early mammalian development.

Hollingsworth, Nancy[1], Ph.D., 1988, University of Washington, Seattle: Chromosome structure and function during meiosis in yeast.

Kernan, Maurice[3], Ph.D., 1990, University of Wisconsin: Molecular basis of mechanical senses.

Kew, Richard B.[5], Ph.D, 1986, Stony Brook University: Leukocyte chemotaxis/ inflammation.

Konopka, James[3], Ph.D., 1985 University of California, Los Angeles: Hormone signal transduction; yeast cell development.

Lyman, Harvard[1], Ph.D., 1960, Brandeis University: Photocontrol of chloroplast development.

Mackow, Erich R.[8], Ph.D., 1984, Temple University: Rotavirus molecular genetics; determinants of viral neutralization and pathogenesis; reverse genetics; biochemistry of cell fusion.

McKinnon, David[3], Ph.D., 1987, John Curtin School of Medical Research, Australia: Molecular physiology of sympathetic neurons and cardiac muscle.

Miller, Todd W.[6], Ph.D., 1989, Rockefeller University: Tyrosine phosphorylation and signal transduction.

Moriya, Masaaki[4], Ph.D. 1981, Nagoya University, Japan: Cellular responses to DNA damage.

Prives, Joav[4], Ph.D., 1968, McGill University, Canada: Cytoskeletal membrane interactions in muscle cells.

Rebecchi, Mario J.[8], Ph.D., 1984, New York University: Phospholipases and signal transduction.

Sampson, Nicole[9], Ph.D., 1990, University of California, Berkeley: Protein stucture-function; mammalian fertilization.

Scarlata, Suzanne[6], Ph.D., 1984, University of Illinois: Structure /oligomerization of membrane proteins.

Spector, Illan[6], Ph.D., 1967, University of Paris, France: Neuronal differentiation and microfilaments.

Spitzer, Eric D.[5], M.D./Ph.D., 1985, Johns Hopkins University: Molecular biology of Cryptococcus neoformans

Thomsen, Gerald H.[1], Ph.D., 1988, Rockefeller University: Growth factors and signal transduction in early vertebrate development; T-box genes.

Tonge, Peter J.[9], Ph.D., 1986, University of Birmingham, England: Spectroscopic insights into enzyme mechanisms and protein structure; drug design.

Trimmer, James[1], Ph.D., 1987, University of California, San Diego: Structure/expression of ion channels.

VanNostrand, William E.[8], Ph.D., 1985, University of California, Irvine: Physiologic and pathophysiologic vascular functions of the Alzheimer's disease amyloid beta-protein precursor.

Zieve, Gary[5], Ph.D., 1977, Massachusetts Institute of Technology: Assembly/transport of snRNP particles.

Assistant Professors

Garlick, Jonathan[10], D.D.S., 1985, Ph.D., 1993, Stony Brook University: Oral and epidermal carcinogenesis/cancer gene therapy.

Hsieh, Jen-Chih[1], Ph.D. 1994, Duke University: Wnt signaling pathways.

Karzai, Wali[1], Ph.D. 1995, Johns Hopkins University: Translational control of gene expression.

Kisker, Caroline[4], Ph.D., 1994, Free University, Berlin, Germany: Crystallographic and biochemical studies of DNA repair enzymes and molybdenum.

Leatherwood, Janet[2], Ph.D., 1993, Johns Hopkins University: Cell-cycle control and DNA replication; fission yeast molecular biology.

Neiman, Aaron[1], Ph.D., 1994, University of California, San Francisco: Vesicle trafficking and intracellular signaling in yeast

Raleigh, Daniel P.[9], Ph.D., 1988, Massachusetts Institute of Technology: Experimental studies of protein folding and amyloid formation.

Schindelin, Hermann[1], Ph.D., 1994, Free University, Berlin, Germany: Structure and function of metalloenzymes and enzymes involved in metallo-cofactor biosynthesis; protein crystallography.

Simmerling, Carlos[9], Ph.D. 1994, University of Illinois, Chicago: Structure and motion of biomolecules.

Thanassi, David G.[2], Ph.D. University of California, Berkley: Virulence factors of pathogenic bacteria.

Tsirka, Styliani-Anna[7], Ph.D., 1989, University of Thessaloniki, Greece: Neuronal-microglial interactions in the physiology and pathology of the central nervous system.

Adjunct Faculty

Dunn, John, *Microbiologist.*[13] Ph.D., 1970, Rutgers University: Structure/function of bacteriophage T7 RNA polymerase.

Grewal, Shiv, *Assistant Professor.*[15] Ph.D. 1992, University of Cambridge, England. Gene repression in fission yeast.

Hannon, Gregory, *Associate Professor.*[15] Ph.D., 1991, Case Western Reserve University: Genetics of growth in mammalian cells and dsRNA-induced gene silencing.

Helfman, David, *Professor.*[15] Ph.D., 1981, Emory University: Cytoskeleton organization and function.

Hernandez, Nouria, *Professor.*[15] Ph.D., 1983, University of Heidelberg, Germany: Trans-cription by mammalian RNA polymerase II and III.

Herr, Winship, *Dean.*[15] Ph.D., 1982, Harvard University: Control of eukaryotic transcription.

Krainer, Adrian, *Professor.*[15] Ph.D., 1986, Harvard University: mRNA splicing; gene expression; RNA-protein interaction.

Lazebnik, Yuri, *Associate Professor.*[15] Ph.D., 1986, St. Petersburg State University, Russia: Molecular mechanisms of apoptosis.

Setlow, Richard, *Professor.*[1,13] Ph.D., 1947, Yale University: DNA damage and repair; carcinogenesis in fish.

Spector, David L., *Professor.*[15] Ph.D., 1980, Rutgers University: Spatial organization of gene expression.

Stenlund, Arne, *Associate Professor.*[15] Ph.D., 1984, Uppsala University, Sweden: DNA replication of papillomaviruses.

Stillman, Bruce, *Director.*[15] Ph.D., 1979, Australian National University: DNA replication and chromatin assembly in human and yeast cells.

Studier, William F., *Professor.*[1,13] Ph.D., 1963, California Institute of Technoloy: Phage T7 replication; large-scale nucleotide sequencing.

Tansey, William P., *Assistant Professor.*[15] Ph.D., 1991, University of Sydney, Australia: Regulation of oncoprotein stability.

Tonks, Nicholas, *Professor.*[15] Ph.D., 1985, University of Dundee, Scotland: Characterization of protein tyrosine phosphatases.

Van Aelst, Linda, *Associate Professor.*[15] Ph.D., 1991, University of Leuven, Belgium: Role of ras in mammalian cell transformation.

Wigler, Michael, *Professor.*[15] Ph.D., 1978, Columbia University: Genomics and cancer.

Number of teaching, graduate, and research assistantships, fall 2003: 87

1) Department of Biochemistry and Cell Biology
2) Department of Microbiology
3) Department of Neurobiology and Behavior
4) Department of Pharmacological Sciences
5) Department of Pathology
6) Department of Physiology and Biophysics
7) Department of Psychiatry
8) Department of Medicine
9) Department of Chemistry
10) Department of Oral Biology and Pathology
11) Department of Obstetrics and Gynecology
12) Department of Anatomical Sciences
13) Brookhaven National Laboratory
14) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1975
15) Cold Spring Harbor Laboratory

Degree Requirements

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

A. Course Requirements

1. MCB 503 Molecular Genetics
2. MCB 517 Biomembranes
3. MCB 520 Graduate Biochemistry
4. MCB 656 Cell Biology
5. HBP 531 General Pathology
6. HBP 533 Immunology

Courses 1 through 6 are taken in the first and second years of the program. Students in the first year also rotate in four laboratories with the goal of selecting an environment for their post-first-year research.

B. Participation in HBP 691, Pathology Journal Club, HBP 590, Seminars in Immunology, and MCB 603/604, Student Seminars in Molecular Biology.

C. Satisfactory performance on a written qualifying exam following the third semester.

D. Submission and successful defense of a research proposal before a preliminary examination committee. This obligation must be addressed before the end of the sixth semester. The committee is selected by the graduate program director on the recommendation of the student and his or her advisor.

E. All students are required to gain faculty-guided experience in teaching. This requirement is generally completed in the first year. Most first-year students are supported by teaching assistantships.

F. When requirements A through E have been met, the student is advanced to candidacy and his or her research is monitored by a dissertation research committee that meets with the student at least once a year.

G. The dissertation committee recommends when the dissertation is suitable for presentation. A successful oral defense before the committee and a seminar before all faculty and graduate students are required before the Ph.D. degree is awarded.

Courses

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.
Prerequisites: Undergraduate degree; health care experience; biochemistry or cell biology; anatomy and microbiology; 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: Histology, gross anatomy, physiology, and biochemistry, prior or concurrent microbiology, or permission of instructor; admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HBP 532 Medical Immunology

Introduces the principles of immunology for professional students, including definition of antigens and antibodies, description of cellular events in the immune response, theories of antibody formation, mechanism of inflammation, hypersensitivity states, and diseases associated with responsiveness of the immune system.
Prerequisites: Advanced course in biology, biochemistry, genetics, and histology (or taken concurrently); permission of the instructor; admission to graduate Health Sciences Center program
Spring, 2 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; 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: Permission of instructor; admission to graduate Health Sciences Center program
Spring, 3 credits, ABCF grading

HBP 553 Pathology of Neoplasia
Studies the nature and behavior of neoplastic tissue, the etiologies of cancer, the effect of tumors upon the host. Includes laboratories to acquaint the student lacking a background in histology or physiology with the appearance and behavior of cancer on the tissue and organ level.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Spring, 2 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.
Prerequisites: HBP 531 or 533; permission of instructor; admission to graduate Health Sciences Center program
Spring, 2 credits, ABCF grading

HBP 556 Laboratory Medicine
A four-week, full-time 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.
Prerequisites: Permission of instructor; 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.
Prerequisites: Permission of instructor; 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.
Prerequisites: Permission of instructor; 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.
Prerequisites: MCB graduate students; admission to graduate HSC program
Fall and spring, 1 credit, S/U grading

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.
Prerequisites: Systems pathology and general pathology course; permission of instructor; admission to graduate Health Sciences Center program
Fall, 1-3 credits, ABCF grading
May be repeated for credit

HBP 691 Journal Club in Pathology
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 cellular and molecular pathology, and critical discussion of selected topics with presentation of papers from the literature.
Prerequisites: MCB graduate students; admission to graduate Health Sciences Center program
Fall and spring, 1 credit, ABCF grading

HBP 800 Summer Research
Full-time laboratory research projects supervised by staff members.
Prerequisites: Permission of instructor; full-time graduate student status; admission to graduate Health Sciences Center program
0 credits, S/U grading

HBP 966 Hematology Conference
Teaches a given aspect of hematology, oncology or immunology. Staff from medicine, pathology, and nuclear medicine participate, and usually presents a case to introduce the subject. Various teaching aids, such as review of pathological material, are used. Primarily for health sciences professionals.
Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
1 - 3 credits, ABCF grading
May be repeated for credit

HBP 967 Tumor Conference
Considers problems in the management of patients with a malignancy and recommendations for a course of therapy for each patient including a review of a particular aspect of cancer treatment or natural history in depth. Functions as the link between the hospital and the Eastern Oncology Cooperative Group. Primarily for health science professionals.
Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
1-3 credits, ABCF grading
May be repeated for credit

HBP 968 Advanced Clinical Pathologic Correlations: Gross Pathology
Postgraduate correlative exercises in human gross pathologic anatomy that emphasize the gross pathologic basis for altered function and clinical manifestations of disease. Open to physicians and others with advanced degrees in medical sciences.
Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
1-3 credits, ABCF grading
May be repeated for credit

HBP 969 Anatomical and Surgical Pathology for Residents in Pathology
To provide practical and clinical experience in tissue pathology. During the four week elective the student is given the opportunity to participate in all aspects of autopsies as well as gross and microscopic examination of surgical specimens. There is ongoing review of general and organ system pathology to reinforce structural-functional correlations. This elective is selected by students who plan a career in pathology as a "hands-on" introduction to the specialty. The elective is also chosen by others, particularly individuals who will enter radiology, and who seek to correlate radiographic and pathologic anatomy. Students who are sufficiently interested and motivated may become involved in relatively independent work-up of selected cases. Primarily for health sciences professionals.
Prerequisite: Permission of instructor; admission to graduate Health Sciences Center program
1-3 credits, ABCF grading
May be repeated for credit

HBP 970 Gross Neuropathology
This elective is intended to expose the student to what it means to be a neuropathologist and to allow the student to read and directly study major diseases of the brain, spinal cord, nerve and skeletal muscle. The focus of such study will be individualized. Available to the student will be (1) attendance at two weekly neuropathology autopsy brain clinical correlation conferences held at University Hospital and at the Suffolk County Medical Examiner's Office in Hauppauge; (2) individual autospy brain case assignment with attending student review and case sign-out; (3) Neurosurgical, neuropathological rotation to include: review of films and patient data, participation in frozen section diagnosis and final neurosurgical sign out (at University Hospital only); (4) focus on peripheral nerve and skeletal muscle to include independent review of: clinical findings, muscle histochemistry, routine microscopy, electron microscopy, teased fiber preparartions and immunofluorescence to be followed by participation at final case review and sign-out with neuropathology attending (at University Hospital only); (5) independent study of study sets, which include Kodachrome sets and microscope slide sets by topic (at University Hospital only).
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
1-3 credits, ABCF grading

HBP 971 Renal Clinicopathologic Correlations
A case-oriented, postgraduate course in renal biopsy interpretation and its relationship to patient management.
Prerequisites: M.D. or Ph.D. degree and clinical experience; admission to graduate Health Sciences Center program
1 credit, ABCF grading
May be repeated for credit

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-7, Room 189 (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.sunysb.edu*; Web site: *www.pharm.sunysb.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 Pharmacology. 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 pectrometry. 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 both 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 (2003-2004) is $22,000 and includes health insurance coverage.

Faculty

Distinguished Professors

Grollman, Arthur P.[1], M.D., 1959, Johns Hopkins University: Chemical carcinogenesis and mutagenesis.

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, Dafna[10], Ph.D., 1984, Stony Brook University: Transmembrane signaling and growth control of cell proliferation and oncogenic transformation.

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.

Hernandez, Nouria[5], Ph.D., 1983, Heidelberg, Germany: Transcription of the human small nuclear RNA genes and the HIV-1 virus.

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, Joel[11], Ph.D., 1980, Washington University: Glial cells; proteoglycans and the regulation of axonal growth.

Mandel, Gail[11], Ph.D., 1978, University of California, Los Angeles: Control of gene expression in cells of the nervous system.

Moll, Ute M.[12], M.D., 1970, Ulm, Germany: Tumor suppressor gene research; mechanism of p53 inactivation.

Pessin, Jeffrey, *Chairperson.* Ph.D., 1980, University of Illinois: Insulin regulation of vesicular trafficking and signal transduction.

Reich, Nancy C.[12], Ph.D., 1983, Stony Brook University: Signal transduction and gene expression induced by cytokines and viral infection.

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.

Schechter, Nisson[15], Ph.D., 1971, Western Michigan University: Structure, function, and regulation of intermediate filament proteins and homeobox proteins during zebrafish neurogenesis.

Schmidt, Jakob[7], 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.

Springer, Charles S. Jr.[8,16], Ph.D., 1967, Ohio State University: In vivo nuclear magnetic resonance studies of biological systems.

Steigbigel, Roy[1], M.D., 1966, University of Rochester: HIV treatment and immunoreconstitution.

Van Nostrand, William[9], 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.

Williams, David L., Ph.D., 1972, University of Illinois, Urbana-Champaign: Cell and molecular biology of apolipoproteins and lipoprotein receptors in atherosclerosis and Alzheimer's disease.

Associate Professors

Bliska, James[10], Ph.D., 1988, University of California, Berkeley: Molecular and cellular basis of bacterial-host cell interactions.

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.

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.

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.

Kisker, Caroline F., Ph.D., 1994, Freie Universitat, Berlin, Germany: Structure-function studies on DNA repair enzymes and molybdenum cofactor containing enzymes.

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.

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.

Prives, Joav M., Ph.D., 1968, McGill University, Canada: Regulation of surface receptors in muscle cells.

Sampson, Nicole[2], Ph.D., 1990, University of California, Berkeley: Integrin receptor interactions in mammalian fertilization/enzymology of cholesterol oxidase.

Schindelin, Hermann[7], Ph.D., 1994, Freie Universitat, Berlin: Structural studies of ubiquitin-dependent protein degradation and neuronal receptor anchoring.

Thomsen, Gerald H.[7], Ph.D.,1988, Rockefeller University: Vertebrate embryonic development

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.

Assistant Professors

Crawford, Howard, Ph.D., 1993, University of Texas Southwestern Medical Center at Dallas: Pancreatic cancer.

De los Santos, Carlos, Ph.D., 1987, University of Buenos Aires, Argentina: NMR solution structures of damaged nucleic acids and repair proteins.

Fu, Dax[6], 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., Ph.D., 1995, Johns Hopkins University: Biochemistry and structural biology of RNA-protein interactions; translational control of gene expression; drug discovery.

Simmerling, Carlos[2], Ph.D., 1994, University of Illinois, Chicago: Computational chemistry and structural biology; molecular dynamics of biological macromolecules.

Tsirka, Styliani-Anna 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.

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, *Associate Professor.* Ph.D., 1989, University of Wisconsin-Madison; Genetic analysis of mammalian oxidative DNA damage repair.

Shibutani, Shinya, *Associate Professor.* Ph.D., 1983, Toyama Medical and Pharmaceutical University, Japan: Mechanisms of translesional DNA synthesis.

Number of teaching, graduate, and research assistants, fall 2003: 28

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. Two electives

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

At the end of 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

Early in 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 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
Fall, 2 credits, ABCF grading

HBH 553 Signal Transduction
The course will emphasize fundamental concepts in signal transduction (e.g., membran-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.
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.
Prerequisite: Permission of instructor, full-time pharmacology graduate status
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

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 four 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.
Prerequisites: Permission of instructor, admission to a graduate Health Sciences Center program
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.
Prerequisites: Permission of instructor, admission to a graduate Health Sciences Center program
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 obesity, psychiatric disease and cardiac disease.
Prerequisites: Permission of instructor, admission to a graduate Health Sciences Center program
Fall or spring, 1 credit, ABCF grading

HBH 634 Chemical Manipulation of DNA Metabolism
This course will focus on two often interrelated aspects of human DNA metabolism, replication and repair. Current models of both processes will be discussed and chemical intervention strategies will be presented, theoretically as well as practically.
Prerequisites: Permission of instructor, admission to a graduate Health Sciences Center program
Spring or fall, 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.
Prerequisites: Permission of instructor, admission to a graduate Health Sciences Center program
Spring or 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.
Prerequisites: Permission of instructor, admission to a graduate Health Sciences Center program
Spring or 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.
Prerequisites: Permission of instructor, admission to a graduate Health Sciences Center program
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 800 Full-Time Summer Research
Full-time laboratory research projects supervised by staff members.
Prerequisites: Permission of instructor, full-time pharmacology graduate status
0 credits, S/U grading

Philosophy (PHI)

Chairperson: Lorenzo Simpson, Harriman Hall 209 (631) 632-7585
Graduate Program Director: Don Ihde, 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 abroad at the Universities of Wuppertal and Marburg. 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, Patrick[7], 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 Lee[6], 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.[2,4], 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., Ph.D., 1967, Harvard University: Social philosophy; philosophy of biological and social science; philosophy of mind; philosophy of law.

Simpson, Lorenzo[9], *Chairperson.* Ph.D., Yale University: Contemporary continental philosophy (hermeneutics and critical theory); philosophy of the social sciences; philosophy of science and technololgy; 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, Ph.D., 1973, Southern Illinois University: Phenomenology and epistemology; philosophical psychology.

Williams, Peter[3,5], Ph.D., 1973, Harvard University: Philosophy of law; ethics.

Associate Professors

Cormier, Harvey, Ph.D., Harvard University: American philosophy; William James and pragmatism; philosophy and culture.

Edwards, Jeffrey, Ph.D., 1987, Universitat Marburg, Germany: History of philosophy; Kant; modern philosophy.

Manchester, Peter[2], Ph.D., 1972, Graduate Theological Union: Greek philosophy; Heidegger.

Mar, Gary[8], Ph.D., 1985, University of California, Los Angeles: Logic; philosophy of mathematics; contemporary analytic philosophy; philosophy of religion.

Mendieta, Edwards, 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 2003: 20

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) Joint appointment, Women's Studies

Degree Requirements

Requirements for the Ph.D. Degree in Philosophy

The doctoral program is designed to be completed in four 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 three following 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. An overall average grade of B or better is required, with no more than six credits of C 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 composed 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, sample papers, 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 and 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

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 legimation 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, Ethinicity, 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 inderdisciplinary and comparative.
Fall, 3 credits, ABCF grading
May be repeated for credit

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 508 Contemporary Matters
May be repeated for credit

PHI 551-AHLS 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 intergenerational 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 the history of Asians in the Americas. This course is offered as both CEI 576 and PHI 551.
3 credits, ABCF grading

PHI 555-SBLS 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 572 Oriental Philosophy

PHI 576 Ethics and Values

PHI 582-AHLS 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

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 and Independent Studies

PHI 620 Advanced Problems in Philosophy
3 credits, ABCF grading
Variable and repetitive credit

PHI 621 Independent Study
May be repeated for credit

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.
Prereguisite: Completion of first year in doctoral program (Philosophy)
Fall, 1-4 credits, ABCF 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
A study of selected conceptions of the nature, structure and content of knowledge, as found in classical and contemporary theories of knowledge.
3 credits, ABCF grading

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: Paul Grannis, Physics Building P-110 (631) 632-8100
Graduate Program Director: Laszlo Mihaly, Physics Building P-107 (631) 632-8279
Assistant Graduate Program Director: Pat Peiliker, 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 thoery, neutrino physics, string theory, supersymmetry, and statistical mechanics. The Nuclear Theory Institute works on the theory of nonperturbative 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 and Alternating Gradient Synchrotron 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 os 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 and are involved in building the new KOPIO experiment that will provide definitive measurements of CP violation in neutral K decays. 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 chaology. 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. The work is done in collaboration with ongoing experimental explorations in many laboratories. Combination of the atoms into a BEC of molecules is also a topic of intense theoretical study, again in collaboration with several experimental groups.

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 protoneutron 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 inital 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 Telecope 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 Ning[1], *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., *Chairperson.* 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.

Van Nieuwenhuizen, Peter[1], Ph.D., 1971, University of Utrecht, Netherlands: Theoretical physics; quantum field theory.

Distinguished Service Professor

Paul, Peter, *Deputy Director for Science, Brookhaven National Laboratory.* Ph.D., 1959, University of Freiburg, Germany: Experimental nuclear physics.

Distinguished Teaching Professor

Metcalf, 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.

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.

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., Ph.D., 1974, Yale University: Experimental atomic physics; quantum chaos; nonlinear dynamics.

Korepin, Vladimir[1], 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, nutrino, 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.

Muether, Herbert R., *Emeritus.* Ph.D., 1951, Princeton University: Experimental nuclear physics.

Rijssenbeek, Michael, Ph.D., 1979, University of Amsterdam, Netherlands: Experimental high-energy physics.

Rocek, Martin[1], Ph.D., 1979, Harvard University: Theoretical physics: supersymmetry and supergravity.

Shrock, Robert[1], Ph.D., 1975, Princeton University: Theoretical physics; gauge theories; statistical mechanics.

Siegel, Warren[1], 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, John[1], 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.

Sterman, George[1], *Director of Yang Institute for Theoretical Physics.* Ph.D., 1974, University of Maryland: Theoretical 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, William[1], 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

Drees, Axel, Ph.D., 1989, University of Heidelberg, Germany: Relativistic heavy ion collisions.

Graf, Erlend H., Ph.D., 1967, Cornell University: Experimental low-temperature 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.

Schaefer, Thomas, Ph.D., 1992, Regensburg University, Germany: Theoretical nuclear physics.

Assistant 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-Garcia[1], Concha, Ph.D., 1991, Universidad de Valencia, Spain: Theoretical elementary particle physics.

Hobbs, John, Ph.D., 1991, University of Chicago: Experimental high-energy physics.

McGrew, Clark, Ph.D., 1994, UCI experimental high energy physics.

Pietralla, Norbert, Ph.D., 1996, University of Cologne, Germany: Experimental nuclear physics.

Weinacht, Thomas, Ph.D., 2000, University of Michigan: Quantum optics and atomic physics.

Research Faculty

Averbeck, Ralf, Ph.D., 1996, Justus-Liebig University, Germany: Experimental nuclear physics.

Bergeman, Thomas, Ph.D., 1971, Harvard University: Theoretical atomic physics, interaction of light and matter, laser cooling, Bose condensation.

Prakash, Madappa, Ph.D., 1979, University of Bombay, India: Theoretical 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.

Zitoun, Robert, Ph.D. 1979, University de Pierre et Marie Curie: 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.

Creutz, Michael[1], Ph.D., 1970, Stanford University: High energy theory.

Dawson, Sally[1], Ph.D., 1981, Harvard University: High energy theory.

DiMauro, Louis, Ph.D., Experimental atomic physics.

Dierker, Steven, Ph.D., 1983, University of Illinois: Experimental solid state physics.

Forman, Miriam, Ph.D., 1972, Stony Brook University: Cosmic rays.

Geller, Marvin, Ph.D., 1969, Massachusetts Institute of Technology: Atmospheric physics.

Kao, Chi-Chang, Ph.D., 1988, Cornell University: Condensed matter physics.

Lee-Franzini, Juliet, Ph.D., 1960, Columbia University: Experimental high-energy physics.

Litvinenko, Vladimir, Ph.D., 1989, Institute of Nuclear Physics, Novosibirsk, Russia: Accelerator physics and free electron lasers.

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.

Tolpygo, Sergei, Ph.D.: Mesoscopic physics.

Tsvelik, 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.

Number of teaching, graduate, and research assistants, fall 2003: 177

1) Member, 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.

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 qualifying 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. Two semesters of PHY 599 Graduate Seminars. This course is normally taken during the first year of graduate study, with each student registering in section 1 during one of the semesters and in section 2 during the other.

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 recommenda-

tion 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.

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 magneostatics 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.
Fall or 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, 3 credits, ABCF grading

PHY 516 Methods of Experimental Research II
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 experiments 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.
Spring, 3 credits, ABCF grading

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.
Spring, 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.
Spring, 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.
Prerequisite: PHY 523 or permission of instructor
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.
Fall or 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.
Fall or 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, 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 mesoscoptic 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 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, 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 properties 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, 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, 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, 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, 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, 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.
Fall or 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 once 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

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 classroon teaching, preperation and supervision of laboratory experiments, exams, homework assignments, and projects.
Fall and spring, 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 guage 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 guage 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, ABCF grading

PHY 623 String Theory II
This course is intended for graduate students who have familiarity with guage 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, ABCF 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 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, ABCF 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.

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

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 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.

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 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, 0-18 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, 1-9 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, 1-9 credits, S/U grading
May be repeated for credit

PHY 800 Summer Research
May be repeated for credit

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 function in mammalian systems.

Research Interests

There are five main research areas in the department:

1. Hormonal regulation of cell function and metabolism

2. Intercellular and intracellular signaling mechanisms

3. Biophysical studies of membranes

4. Cellular electrophysiology and neurobiology

5. 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 hormone action and enzyme regulation. 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 a strong biophysical component 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 Biophysics Program. 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, recognizing the importance of translational research, the Institute of Molecular Cardiology at Stony Brook was established in 1998. The aim of the Institute is to bring 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, and cardiac contractility.

Research Facilities

The Department of Physiology and Biophysics is well equipped with major research instrumentation for physiological, metabolic, and biochemical studies. Major items include scintillation counters, ultracentrifuges, amino acid analyzers, protein sequencers, DNA synthesizer, DNA sequencer, 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.

Molecular Biology Core

The molecular biology core was established to provide students and faculty ready access to DNA/RNA recombinant technology. Departmental facilities now 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 over 60 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, first- and second-year graduate students have exclusive use of two additional high-end PCs for word processing, data analysis, and network access. All computers are connected directly, 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 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. Consequently, our students pursue graduate studies that range from strictly biochemical to the strictly biophysical.

Overview of Curriculum

During the first year, all students take courses in cellular and organ systems physiology, graduate biochemistry, and biophysical chemistry. 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 two research concentrations available to graduate students: Cellular and Molecular Physiology, and Biophysics.

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 conssists 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 Studies

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.

Requirements and Procedures

Advisory Committee

After admission and until the student qualifies for candidacy, the student's education is directed by his or her Advisory Committee. The Advisory Committee consists of at least three members of the faculty whose backgrounds coincide with the scientific interests of the student. 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 Advisory 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, Biomembranes MCB 517, Graduate Biochemistry MCB 520, Human Physiology HBY 501 or Medical Physiology HBY 502, Teaching Practicum HBY 695, Research in Physiology and Biophysics HBY 591, Journal Club HBY 570, Seminars in Physiology and Biophysics HBY 690, Thesis Research in Physiology and Biophysics HBY 699, and Biophysical Chemistry HBY 511 or Physical Biochemistry MCB 512.

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. Experimental Design and Data

Analysis courses HBY 561, HBY 562, HBY 563, HBH 556, Molecular Genetics HBM 503, Molecular and Physiological Basis of Drug Action HBH 533, Immunology HBP 533, Experimental Techniques in Physiology HBY 564, 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. When the thesis advisor is selected, he 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 chairman 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, Carol[17], 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.

Edelman, Norman H.[2], *Dean, School of Medicine and Vice President, Health Sciences Center.* M.D., 1961, New York University: Role of the brain in hypoxia in the control of breathing.

Fajer, Jack[7], 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, Lorne[1], Ph.D., 1965, Massachusetts Institute of Technology: Physiology and modifiability of synapses in the spinal cord.

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, John[2], 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.

Smith, Steven O.[14], Ph.D., 1985, University of California, Berkeley: Molecular mechanisms of signal transduction.

Stephano, George[15], 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.

Dilger, James P.[5], Ph.D., 1980, Stony Brook University: Neuromuscular junction; ion channels in nerve membranes.

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, David[1], Ph.D., 1987, Australian National University: Control of ion channel expression.

Miller, W. Todd, Ph.D., 1988, Rockefeller University: Protein structure and function; molecular mechanisms of signal transduction.

Scarlata, Suzanne, *Graduate Program Director.* Ph.D., 1984, University of Illinois: Biophysics of signaling proteins.

Smaldone, Gerald C.[2], M.D., Ph.D., 1975, New York University: Respiratory physiology.

Solomon, Irene C., Ph.D., 1994, University of California, Davis: Reflex and central neural control of cardiovascular and respiratory function.

Spector, Ilan, Ph.D., 1967, University of Paris, France: Electrophysiology of nerve and muscle cell lines; ion channels; neurotoxins.

Assistant Professors

Entcheva, Emilia[18], Ph.D., 1998, Memphis: Cardiac cell function.

Frame, Mary[18], Ph.D., 1990, University of Missouri: Microcirculation; tissue engineering; nanofabrication.

Nassar, Nicolas, Ph.D., 1992, University Joseph Fourier and EMBL: Protein-protein interactions.

White, Thomas W., Ph.D., 1984, Harvard University: Biology of cell-to-cell communication and gap junction.

Research Faculty

Baldo, George J., *Assistant Professor.* Ph.D., 1982, Stony Brook University: Lens intercommunication; gap junctions.

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.

Ramanan, S.V., *Assistant Professor.* Ph.D., 1986, Stony Brook University: Biophysics of ion channels.

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.

Yokoyama, Noriko, *Assistant Professor.* Ph.D., 1981, Nihon University, Japan: Involvement of protein phosphatase 2A in tyrosine kinase signaling pathway.

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 HBY 501 or HBY 502, HBY 530, HBY 511 or MCB 512, MCB 517, MCB 520, HBY 570, HBY 591, HBY 690, HBY 699, HBY 695, and four 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

HBY 501 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

HBY 502 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, gastroiontestinal, endocrine, skeletal, reproductive, and integumenary systems.
Prerequisites: Permission of instructor; admission to graduate Health Sciences Center program
Spring, 4 credits, ABCF grading

HBY 511 Introduction to Biophysical Chemistry
Introduces the chemical principles and techniques needed for the study of biological macromolecules. Topics covered include solution chemistry, chemical thermodynamics, binding and dissociation equilibria, denaturation phenomena, spectroscopy, and hydrodynamics. This course is intended to prepare non-chemistry majors for more advanced work in biophysics.
Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HBY 530 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.
Prerequisites: Undergraduate physics, physical chemistry, biology, calculus, or permission of instructor; admission to graduate Health Sciences Center program
Fall, 4 credits, ABCF grading

HBY 531 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 integumenary systems.
Prerequisites: Admission to medical or dental school and permission of instructor
Spring, 8 credits, ABCF grading

HBY 552 Physiology of Excitable Membranes
Covers the resting potential, the basis of the action potential, linear cable properties and synaptic transmission. Studies squid axon, the neuromuscular junction and the cardiac Purkinje fiber model systems.
Prerequisite: Physics, physical chemistry, and calculus; admission to graduate Health Sciences Center program
Fall or spring, alternate years, 3 credits, ABCF grading

HBY 553 Signal Transduction
The course will emphasize fundamental concepts in signal transduction (e.g., membran-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.
3 credits, ABCF grading

HBY 556 Exp Design and Data Analysis in Physiological Research
This course is designed to introduce the principles of experimental design relevant to modern physiological research. Emphasis will be placed on data acquisition, signal processing and statistical analyses associated with basil experimental approaches currently used in physiological research.
Prerequisites: Introductory statistics; 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 processsing, metabolism and replication.
Prerequisites: Systems physiology and biochemistry; 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
Fall, 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, 1 credit, 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
Fall and spring, 1 credit, S/U 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
Fall and spring, 1 credit, S/U grading
May be repeated for credit

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

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

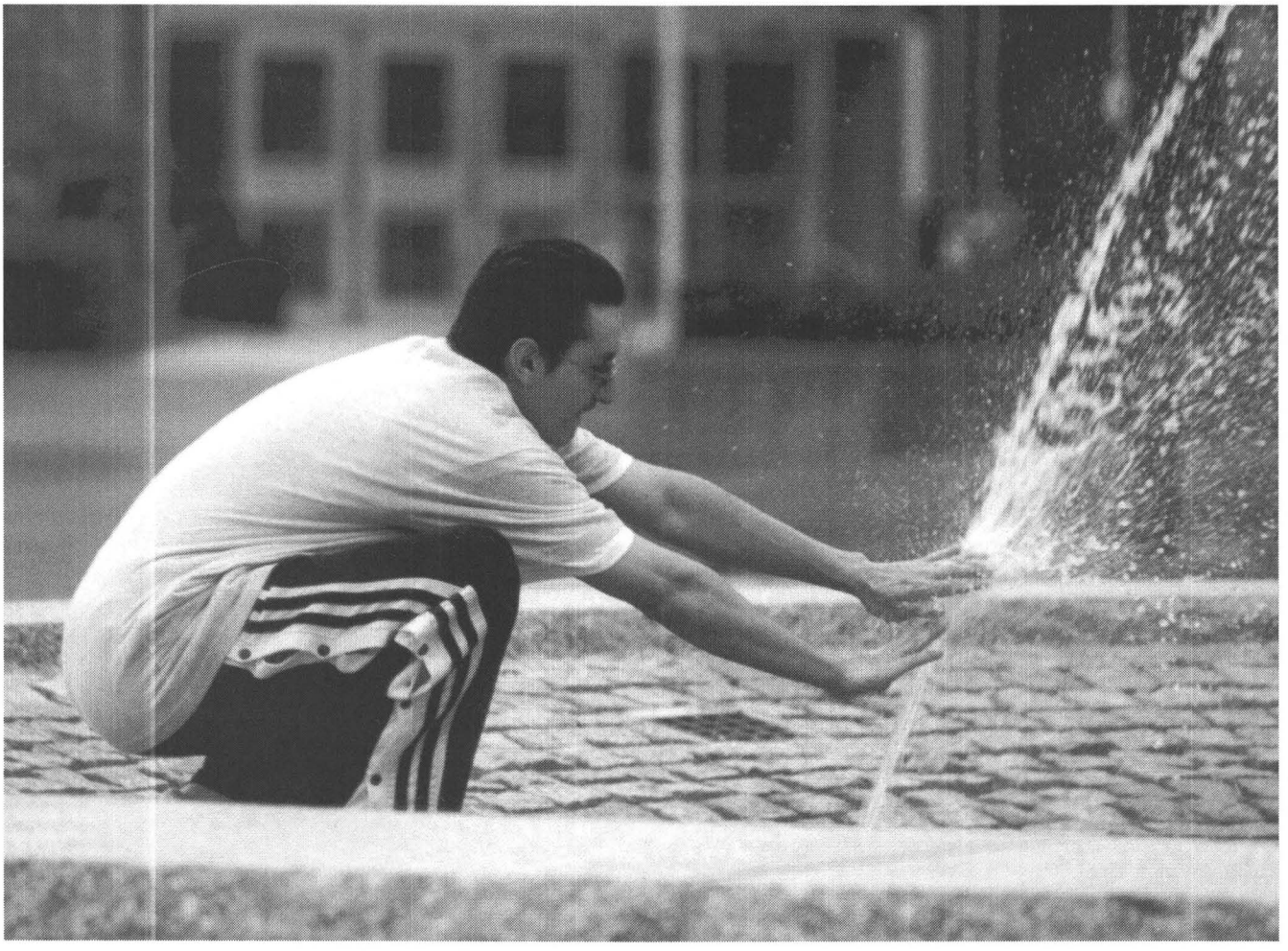
HBY 695 Practicum in Teaching in Physiology and Biophysics
Practical experience and instruction in the teaching of physiology and biophysics carried out under faculty orientation and supervision.
Prerequisite: Admission to graduate Health Sciences Center program
1 credit, ABCF grading
May be repeated 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); admission to graduate Health Sciences Center program
Fall, spring, and summer, 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; 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

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
0 credits, S/U grading



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: Suzanne Allsopp, 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., 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; education policy.

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.

Segal, Jeffrey A., *Chairperson.* Ph.D., 1983, Michigan State University: Judicial process and behavior; research methods; American politics.

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.

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.

Lavine, Howard, Ph.D., 1994, University of Minnesota: Political psychology; cognition.

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.

Number of teaching, graduate, and research assistants, fall 2003: 21

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

Most courses do not have a specific semester offering. Please refer to the Undergraduate and Graduate Class Schedules for specific semester offerings.

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: Some elementary mathematics/statistics background helpful; 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: POL 501 or equivalent; 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. Crosslisted with CER.
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.
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-SBLS 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-SBLS 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.
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.
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.
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
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
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.
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.
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
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.
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.
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
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.
3 credits, ABCF grading

POL 615 Legislative Process
A seminar on the legislative process, focusing on current research on the United States Congress.
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.
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.
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
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.
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.
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
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.
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.
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.
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
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
3 credits, ABCF grading
May be repeated for credit

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
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
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
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
1-9 credits, S/U grading

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

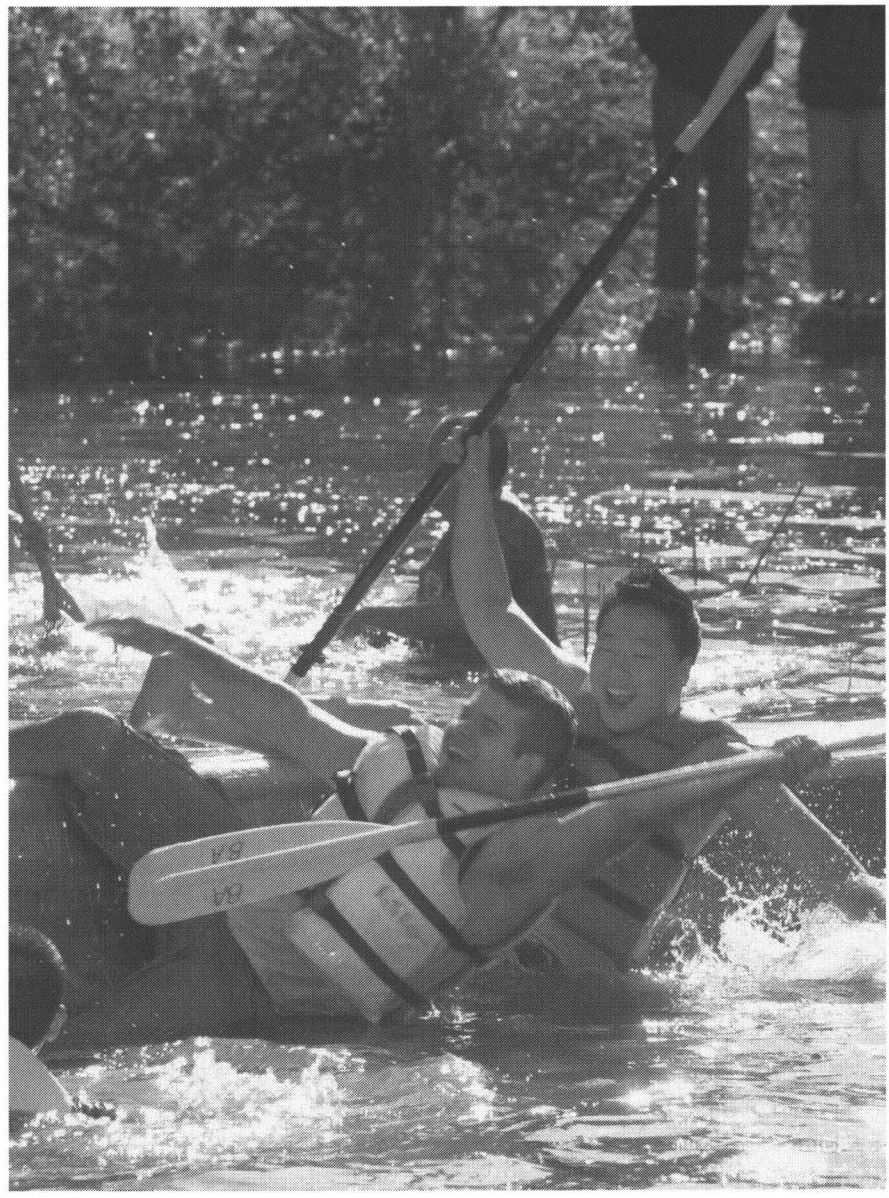
POL 693 Practicum in Teaching

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

Dean: Paul J. Edelson, Ward Melville Social and Behavioral Sciences Building N-203 (631) 632-7052
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) 632-7050
Director of Admission and Advisement: Judith Daly, Ward Melville Social and Behavioral Sciences Building N-201 (631) 632-7050, option 3

Advanced Graduate Certificates awarded: AGC in Coaching; AGC in Computer Integrated Engineering; AGC in Educational Computing; AGC in Environmental/Occupational Health and Safety; AGC in Human Resource Management; AGC in Information Systems Management; AGC in Operations Research; AGC in School Administrator and Supervisor; AGC in School District Administrator; AGC in Waste Management
Degrees awarded: Master of Arts in Liberal Studies; Master of Arts in Liberal Studies Online; MAT in English 7-12; MAT in Foreign Languages 7-12 (French, Italian, German, or Russian); MAT in Mathematics; MAT in Science 7-12 (Biology, Chemistry, Earth Science or Physics); MAT in Social Studies 7-12; Master of Professional Studies

The School of Professional Development (SPD) offers graduate degree and advanced certificate programs for part-time and full-time students. To meet the needs of working professionals, SPD schedules more than 200 evening, online, and off-campus courses 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 (MAT) programs covering 11 different content fields.

SPD offers the largest Educational Leadership program within New York State. Completion of this post-master's certificate program leads to a diploma with certification and licensure in one of two educational leadership areas: School District Administrator and School Administrator/Supervisor. SPD also offers advanced graduate certificate programs that focus on the needs of the region and emerging professions in coaching, educational computing, environmental/occupational health and safety, human resource management, industrial management, information systems management, operations research, and waste management.

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

Master of Arts in Liberal Studies (MA/LS)

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.*

MA/LS Online

The MA/LS is also available in a completely online 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. 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, but the 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 and 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 secondary grades 7-12 provisional teacher certification in MAT subject areas (i.e., English, French, German, Italian, Russian, 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.

MAT in 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*. 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.

MAT in Foreign Languages: French, Italian, German, or Russian

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, Italian, German, or Russian in the secondary schools (grades 7-12). The French, Italian, German, and Russian 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/matfl*. 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.

MAT in Teaching 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*. Prospective students can also address inquiries to Dr. Bernard Maskit, Director, MAT in Mathematics, Stony Brook University, Stony Brook, New York 11794-3651; or telephone (631) 632-8257 or 632-7055.

MAT in 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 the School of Professional Development, 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*, 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

MAT in 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 36 graduate credits of coursework.

For complete admission and program requirements, visit SPD on the Web at *www.stonybrook.edu/spd/graduate/matss*. 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 certificate program leads to a diploma with certification and licensure in one of two educational leadership areas: School District Administrator or School Administrator/Supervisor.

School District Administrator (SDA) Advanced Graduate Certificate

This advanced graduate certificate program prepares educators for advancement to positions at the central office level, including 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 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/sda*. 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 Administrator and Supervisor (SAS) Advanced Graduate Certificate

School teachers interested in pursuing a challenge beyond the classroom are invited to apply for this advanced graduate certificate program, which pro-

vides 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/sas*. 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

Advanced Graduate Certificate 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, Computer Integrated Engineering, Educational Computing, Environmental/Occupational Health and Safety, Human Resource Management, Industrial 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 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 in Coaching

The Division of Physical Education and Athletics, in collaboration with SPD, is authorized by the State Education Department to offer an advanced 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*. Prospective students can contact Theresa Tiso, Department of Physical Education, at (631) 632-7215.

Advanced Graduate Certificate in Computer Integrated Engineering

The primary goal of the Advanced Graduate Certificate in Computer Integrated Engineering program is to help engineers develop competency in not only the advanced theory, but also the computer-based tools essential for engineering design and analysis. Engineers are faced with increasing pressure to keep up with the latest technologies, such as computer and computer-based tools for engineering design, analysis, and manufacturing. Some find it impossible to take on the burdens of a full master's program and therefore are looking for alternatives to get the graduate education.

The 18-credit program is offered in collaboration with the Department of Mechanical Engineering in the College of Engineering and Applied Sciences and articulates with the MS in Engineering with concentrations in the areas of Design and Manufacturing, Solid Mechanics, Thermal Sciences, and Fluid Mechanics as well as the Master of Arts in Liberal Studies (MA/LS) offered through the School of Professional Development (SPD). Prospective students are required to have a bachelor's degree in Mechanical Engineering prior to applying to this program.

For complete admission and program requirements, visit SPD on the Web at *www.stonybrook.edu/spd/graduate/computer_integrated*. Prospective students can also contact Dr. Qiaode J. Ge, Program Director, Department of Mechanical Engineering, at (631) 632-1110.

Advanced Graduate Certificate 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 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*. Prospective students can also contact Joanne English Daly, Director of the Educational Computing Program, Department of Technology and Society, at (631) 632-9940.

Advanced Graduate Certificate in Environmental/Occupational Health and Safety

The 18-credit graduate certificate program in occupational health and safety is offered jointly by the Department of Preventive Medicine in the Health Sciences Center and SPD. It is designed to prepare students for professional positions in the detection and management of a wide range of environmental health hazards. Specifically, the program provides a forum for the discussion of local and national health concerns such as air and water pollution, hazardous waste disposal, accident prevention, fire protection, and job-related health hazards.

For complete admission and program requirements, visit SPD on the Web at *www.stonybrook.edu/spd/graduate/eohs*. Prospective students can also contact Wajdy Hailoo at the Center for Occupational and Environmental Medicine at (631) 444-2154.

Advanced Graduate Certificate 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*. Prospective students can also contact Jeff Casey, Director of Graduate Studies at the W. Averell Harriman School, at (631) 632-7171.

Advanced Graduate Certificate 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*. Prospective students can also contact T. Owen Carroll, W. Averell Harriman School, at (631) 632-7476.

Advanced Graduate Certificate in Operations Research

The AGC 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*. Prospective students can also contact Professor Alan Tucker, Coordinator of Operations Research in the Department of Applied Mathematics and Statistics, at (631) 632-8365.

Advanced Graduate Certificate 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 graduate certificate program 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*. 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: Amy Barry, Psychology B 150 (631) 632-7855
To request application materials: Call (631) 632-7814 or visit *www.psychology.sunysb.edu/psychology*

Degrees awarded: M.A. in Psychology; Ph.D. in Biopsychology; Ph.D. in Clinical Psychology; Ph.D. in Experimental Psychology; Ph.D. in Social/Health Psychology

The Department of Psychology, in the College of Arts and Sciences, is one of Stony Brook's largest graduate departments. More than 600 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: Clinical Psychology, Social/Health Psychology, Cognitive/Experimental Psychology, and Biopsychology. 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, the Department of Psychiatry, and Brookhaven National Laboratory's Medical Department, 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 Clinical Psychology, Social/Health Psychology, Experimental Psychology, or Biopsychology.

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/psychology*. Stony Brook's doctoral program in clinical psychology is registered for licensure in psychology with the New York State Education Department and is approved by the American Psychological Association.

In all areas, the primary emphasis is on research training through research, advisement, and apprenticeship. 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 Biopsychology area has its own facilities for human electrophysiology (64 electrode), 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 largely on the Psychology Department's large volunteer pool of human subjects. Some studies are conducted on patients with memory disorders.

The Social/Health area faculty have affiliations with a number of departments in Stony Brook University Medical School. Social/Health facilities include laboratories for cross-sectional and longitudinal studies of attachment, pregnancy, 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. Two official copies 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. Acceptance by the department and Graduate School.

Students who do not meet these requirements may also apply if they feel that special circumstances should be considered. The deadline for receipt of applications and all supporting materials for fall admission is January 15. Applications may be submitted online.

Faculty

Distinguished Professors

O'Leary, K. Daniel, *Director of Clinical Training.* Ph.D., 1967, University of Illinois: Etiology and treatment of marital discord and spouse abuse; the effects of marital discord on childhood problems.

Rachlin, Howard, *Distinguished Research Professor.* 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.

Goldfried, Marvin, Ph.D., 1961, University at Buffalo: Gay, lesbian, and bisexual issues; psychotherapy process research; cognitive behavior therapy.

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; disorders; assessment, classification, course, development, familial transmission, and treatment of depression.

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; inhibitory processes in memory; priming; 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, 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/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., 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, *Head, Biopsychology Area.* Ph.D., 1991, University of New Hampshire: Rodent models of learning and memory disorders; behavioral actions of neuropeptides and anandamidergics.

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.

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: Women's health; psychosocial oncology; 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.

Joint and Associated Faculty

Biegon, Anat, *Senior Scientist, Medical Department, Brookhaven National Laboratory.* Ph.D., 1980, Feinberg Graduate School, the Weizmann Institute of Science: Neuropharmacology; neuroimaging; age differences in vulnerability to neurological damage.

Crowell, Judith A., *Associate Professor, Psychiatry.* M.D., 1978, University of Vermont: Child and adolescent psychiatry; 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.

Gatley, (Samuel) John, *Scientist, Medical Department, Brookhaven National Laboratory.* Ph.D., 1975, University of Newcastle-upon-Tyne: Biochemical pharmacology; radiopharmaceutical chemistry; radiotracers; neuropharmacology.

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).

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.

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

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.* Ph.D., 2001, University of Rochester: Natural language generation and dialogue management in multimodal dialogue systems; theories of discourse and discourse structure; information extraction.

Stone, Arthur, *Professor, Psychiatry.* Ph.D., 1978, Stony Brook University: Stress, coping, and illness; immune system functioning and health.

Wang, Rex, *Professor, Psychiatry.* Ph.D., 1975, University of Delaware: Neuropsychopharmacology; the mode of action of antipsychotic drugs and hallucinogens; physiology and pharmacology of dopamine and serotonin systems.

Wolf, Gerrit, *Professor, Harriman School for Management and Policy.* Ph.D., 1967, Cornell University: Public policy and management; social policy; decision and organizational behavior.

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.

Research Faculty

Grackin, Janice A., *Research Assistant Professor.* Ph.D., 1999, Stony Brook University: Educational assessment; human learning behavior and environments; diversity and equity in education.

Heyman, Richard, *Associate 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.

Degree Requirements

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

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. 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 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 thesis 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.

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

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/Health Psychology

Complete the following course in the first or second year (required of all Social/Health students):

PSY 620 Current Research in Social/Health Psychology

Complete one of the following two courses in the first or second year:

PSY 554 Health Psychology
PSY 555 Social Psychology

Complete one of these courses during the first three years:

PSY 544 Emotions
PSY 549 Prejudice
PSY 558 Social Psychology: Health Applications
PSY 620 Attachment
PSY 620 Close Relationships

Complete one of these courses, or an additional methods or statistics course, during the first three years:

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

Complete an additional special topics course (PSY 610 or 620) during the first three years

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
BNB 560 Laboratory in Neuroanatomy

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

Clincal 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 601 Orientation to Clinical Psychology (Fall and Spring)
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

(Supervised Practice continues into the third year.)

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, 0 credits, S/U grading

PSY 505 Multivariate Methods Including Structural Equation Modeling
Brief coverage of specialized techniques used in data analysis in psychology, such as multiway frequency analysis, cluster analysis, multidimensional scaling, and meta-analysis, and more thorough coverage of structural equation modeling. The course emphasizes hands-on work with real data sets, using the SAS and EQS statistical software packages.
Fall or spring, alternate years, 3 credits, ABCF grading

PSY 506 Psychometric Methods
This course examines 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 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 0 credits, 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

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
The information in this course integrates and expands some of the research and new methods available in the study of the complex human processes such as language, memory, and growth of logical thinking.
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, 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
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 the social and psychological 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 548 Program Evaluation
This course focuses on the scientific study of human interventions to ameliorate social problems. It will examine a variety of programs such as affirmative action, Head Start, Medicaid, Medicare, the War on Drugs, and welfare to illustrate the major concepts in conducting an evaluation. These include: cost-benefit analysis, design, evaluation synthesis, goal setting, needs assessment, program monitoring, theory, and utilization.
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 553 Social Community Practicum
Fall or spring, alternate years, 1-3 credits, S/U grading

PSY 555 Social Psychology
A survey of the field of social psychology. We investigate theories and research in social psychology through coordinated readings, lectures, films, and group discussions. Particular emphasis is placed on the relevance of social psychology to national and international problems. The course is designed to introduce students to a variety of topics, rather than focusing closely on a limited number of issues. Prior familiarity with the topics is not assumed.
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 560 Neuropsychology
The functions of the normal and pathological primate brain in behavior. Consideration of anatomical, electrophysiological (EEG), 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 once 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 Women
Theoretical approaches to the psychology of women including Freud, Horney, Thompson, Horner, and Rossi. Women and the life cycle from adolescence to old age. Included are adolescent identity formation, female sexuality, marriage, childbirth, motherhood, and problems of middle and old age. Women in psychology textbooks-truth or fantasy? Women and psychopathology and psychotherapy. The psychology of the "new woman."
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, 0 credits, 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 of 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 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

PSY 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

PSY 800 Full-Time Summer Research
May be repeated for credit

PSY 810 Summer Research

PSY 820 Summer Teaching–CED

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, applications, 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

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. The program is designed to be completed in a minimum of four years for full-time students. In the first three years, students take three courses each semester. 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. Three samples 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 compleed 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 completing 24 credit hours of doctoral coursework at the School of Social Welfare at Stony Brook University.

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.

Professor of Clinical Social Work

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; use of complementary medicine.

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., *Associate Dean for Administration.* 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.

Vidal, Carlos M., *Associate Dean for 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.

Assistant Professors

Finch, Jean Bertrand, Director of 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.

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.

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.

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.

Francis, Linda E., *Director of the MSW Program.* Ph.D., University of Indiana: Mental health; health services research; qualitative methods; stress and emotion.

Murphy, Bertha, M.S.W., Stony Brook University: Substance abuse and ethnically sensitive practice.

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.

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 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
0 credits, S/F graded

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.
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.
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 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, Letter graded (A, A-, B+, etc.)

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. Co-scheduled with HWC 369.
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 practice 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 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.
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 558 Human Service Administration
An introduction to the practice of administration 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 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 Advanced Practice in Higher Education
Encourages students in the Student-Community Development Specialization to further develop skills and knowledge necessary for effective practice in higher education settings. Emphasizes research and organizational theory and practice as applied to campus communities.
Prerequisite: Admission to graduate Health Sciences Center program
1-3 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 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.
Prerequisite: Admission to graduate Health Sciences Center program
2 credits, ABCF grading

HWC 581 Public Health and Epidemiology
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).
Prerequisite: Admission to graduate Health Sciences Center program
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.
Prerequisite: Admission to graduate Health Sciences Center program
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 knoweldge, 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 require-

ment 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 once 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.
Prerequisite: Admission to graduate Health Sciences Center program
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 five 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
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, theroretical, 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 committtees 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 800 Full-Time Summer Research
Prerequisite: Admission to graduate Health Sciences Center program
0 credits, S/U grading

Sociology (SOC)

Chairperson: Diane Barthel, 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 specialities.

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, Judith[3], 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, Diane, *Chairperson.*[4] Ph.D., 1977, Harvard University: Culture; community; historical; gender.

Cole, Stephen[5], Ph.D., 1967, Columbia University: Science; gender; theory.

Feldman, Kenneth[6], 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, Michael[7], 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.

Smith, Jackie, Ph.D., 1995, University of Notre Dame: Global sociology; international institutions; collective behavior; social movements; environment and development.

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.

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 2003: 28

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 Three Papers: In this option, a student can meet M.A. requirements and proceed to the second half of doctoral work through the submission of three papers written under faculty supervision. These should normally be completed by the beginning of the fourth academic year; each of the three 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 substantive areas must be represented in the three papers. The three papers are designed to demonstrate three kinds of skills:

1. Theory paper: An attempt to say something original, focused on theoretical questions, i.e., how they should be addressed or refined. Evaluating alternative theoretical positions in light of available evidence or data is an acceptable possibility for such a paper.

2. Empirical paper: Should include some justification for why this particular manipulation of data is necessary or desirable. Of the three papers, this is the one that is intended to look most like a research report. A wide variety of methods is permitted.

3. One of the following two options:

a. Analytical review of the state of the art in some substantive area in sociology. This paper can take one of two forms: a review essay (see *Journal of Economic Literature, Psychological Review,* or *Annual Review of Sociology*), or an essay that outlines a field for use in teaching a graduate seminar.

b. Research proposal: This is to be a major research proposal. It should include a review of the relevant literature and statements concerning the theoretical framework used, 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 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, interaction 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 546 Sociological Perspectives on American Society
Analysis of American social structure. Political and economic institutions and their bearing on social problems. Students attend the lectures of CES 581 (consult the School of Professional Development section of this bulletin) and a supplementary seminar.
4 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.
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
0 credits, S/U grading

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 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 disciplines: 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 these 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 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, the Spatial Sciences Learning Laboratory, is used by faculty and students for experimental research on learning and special purpose projects. It consists of 14 Pentium Desktop computers integrated into the campus WAN.

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 provisional 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 lifecycle analysis; nuclear, chemical, and biological threats; technology assessment; homeland security and the war on terrorism.

Assistant Professor

Smith, Glenn G., Ph.D., 1998, Arizona State University: Computer games; spatial visualization; distance education; tactile output devices.

Lecturers

Daly, Joanne English, M.S., 1994, Stony Brook University: Technological systems management.

Schiller, Herb., M.S. Management, 1973, Polytechnic University; M.S.M.E., 1966, California Institute of Technology: Operations management; manufacturing systems.

Adjunct Lecturers

Boyle, John, M.S., 1980, Stony Brook University: Technological systems management.

Caris, Mieka, M.A., 1984, Jan Van Eijck Academy, Maastricht, Netherlands: Mixed media.

Clark, Robert, M.S., 1999, Stony Brook University: Technological systems management.

Cohen, Jerome, B.B.A., 1955, City College of New York: CPA.

Davis, Jack, M.S., 1951, University of North Carolina: Sanitary engineering.

Kornfeld, Edward, B.B.A., 1965, Pace University.

Kruger, Matthew I., M.S., 1996, Stony Brook University: Technological systems management.

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.

McHugh, Paul, M.A., 1998, Stony Brook University: Technological systems management.

Miller, Philip, J.D., 1973, New York Law School.

Mitra, Katherine, M.S., 2001, Stony Brook University: Technological systems management.

Moriarty, Kevin, M.B.A., Dowling College.

O'Connor Gerry, M.A.L.S., 1970, Stony Brook University: English.

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.

Siegel, Paul, M.S., 1997, Stony Brook University: Technological systems management.

Stenton, Kenneth, M.B.A., 1992, Wharton School of Business.

Number of teaching, graduate, and research assistants, fall 2003: 7

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, Mathmatics, 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 in the Educational Computing concentration, 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, EST 530 or any course approved by the program director.

Educational Computing Concentration

Required Courses (15 credits): EST 565, EST 570, EST 571, EST 572, EST 590, Master's Project

Suggested Electives (9 credits): EST 520, EST 530, EST 573, EST 576, CEI 511, CEN 580, EST 583, 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 or EST 599, Master's Project

Suggested Electives (9 credits): EST 574, EST 576, EST 584, EST 586, EST 588, EST 591, EST 592, EST 599, CEY 503, CEY 505, CEY 509

Advanced Graduate Certificate in Education 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 570, EST 571, EST 572

School Track

Choose one of three:

EST 573, EST 583, EST 585

Choose one of three:

EST 591, CEI 511, CEN 580

Business Track

Choose one of three:

EST 509, EST 520, EST 530

Choose one of three:

EST 573, EST 591, EST 596

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.
3 credits, ABCF grading

EMP 502 Management Accounting and Financial Decision Analysis
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

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
3 credits, ABCF grading

EMP 506 Production and 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 MGT 589 and EMP 506.
Prerequisite: MGT 515
Spring, 3 credits, ABCF grading

EMP 507 Research and Special Topics in Industrial Management
An individual study course for students investigating special topics relating to industrial management.
Prerequisite: Permission of instructor
Fall and spring, 1-3 credits, ABCF grading

EMP 509 Management Information Systems
This course covers the different types of management information systems, basic and advanced assets of MIS, re-engineering the business with information systems, and the relationship among technology, organization, and management. Knowledge-based and web-based features in modern MIS will be emphasized. Database Management, Security, Control, Ethical, and Social issues of information 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 your plan to the financial community. Specific case studies and guest speakers are utilized.
Spring, 3 credits, ABCF grading

EMP 512 Starting the High Technology Venture II
This course continues the development of a business plan for a new venture based on a high technology product or service. Students work in small groups to develop a complete business plan. The course concludes with presentations by each group to a panel of experts who evaluate and critique each project plan. Co-scheduled with EST 422.
Prerequisite: EMP 511 or permission of instructor
3 credits, ABCF grading

EMP 517 Quality 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.
3 credits, ABCF grading

EMP 518 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

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 565 Personal Computers in Learning Environments
This course examines issues in teaching and learning, especially the use of personal computers to investigate unique types of learning that are made possible, or may be more efficient, with this technology. Exposure to generic Windows-based applications, and an overview of commercial software titles and applications is provided. Students have the opportunity to work collaboratively with others in this field, and are able to develop a working application that could be used in a classroom.
Prerequisite: EST 583 or permission of instructor
Fall, spring, and summer, 3 credits, ABCF grading

EST 570 Design of Computer Courseware
The purpose of this course is to enhance the student's ability to develop computer-based courseware modules in the student's discipline. Existing courseware modules are described to illustrate the structure requirements of such modules. After each exposure, 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. Students design and implement the programs in state-of-the-art computer labs.
Prerequisite: EST 565 or permission of instructor
Fall and spring, 3 credits, ABCF grading

EST 571 Computer-Based 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 leadership skills as a professional educator and exploring micro-worlds and constructivism. The course includes hands-on computer experience and class discussions to assess the quality of research articles on educational technology.
Prerequisite: EST 565 or permission of instructor
Fall and spring, 3 credits, ABCF grading

EST 572 Educational Uses of the Information Highway
This practical hands-on course is designed for educators, multimedia specialists, and administrators who are interested in exploring the Information Highway, a rich resource of learning opportunities. Students will construct Web pages, sharpen navigational skills and search strategies, and design and evaluate ways to integrate this new technology into the classroom.
Prerequisite: Computer experience
Fall, spring, and summer, 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 565 or permission of instructor
Co-requisite: EST 570 or permission of instructor
Spring, 3 credits, ABCF grading

EST 574 Web-based Educational Environments
The uses of Web-based distance learning applications are quickly growing within higher education institutions, K-12 schools, and corporate environments. This course is designed for higher education faculty, K-12 administrators and teachers, educational computing coordinators, and corporate training personnel that would like to investigate ways to enhance their educational systems through the development and implementation of distance learning application. The focus of this course is on the design and implementation of effective modes of distance learning.
3 credits, ABCF grading

EST 576 Geographic Information Systems in Education and Research
Using 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
Fall and spring, 3 credits, ABCF grading

EST 581 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

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 583 Computer Literacy for Teachers
This course has two objectives: First, K-12 teachers will develop a basic understanding of digital computers, how they work, and their applications. Second, teachers will learn how these applications are used within the classroom and classroom management techniques, as well as the social implications of the use of computers in education, business, and artificial intelligence, virtual environments, robotics, medicine, and government.
Fall, 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 man's activities.
Prerequisites: College chemistry or permission of instructor
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 tommorow. Students are exposed to various educational technologies and 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. 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.
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 economics. 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. They 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.
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. This course is offered as both CEY 594 and EST 594.
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.
Prerequisites: MAT 132 and one year of quantitative science such as physics, chemistry, or geology; or permission of instructor
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.
Prerequisite: EST 595 or permission of instructor
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. The institutional and regulatory climate. Current and planned practices in the region. Hazardous waste. This course is offered as both CEY 597 and EST 597.
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).
Fall, 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. Effective communications systems, such as radio, television, and the Internet must be designed to match the capabilities of the human user. An example of good ergonomic design is how a stereo system is designed to match the hearing characteristics of humans. The underlying principles communications systems, such as electromagnetic spectrum, analog and digital signals, resonance, and redundancy are explored. Human and societal impacts of communications technology also are studied.
Fall, spring, and summer, 3 credits

CEN 580 Socio-Technological Problems
A series of case studies of current socio-technological problems encompassing such areas as health service delivery, water supply, population, emergency medical care, auto safety, noise pollution, and energy crisis. The problem in each case is studied historically and alternatives are developed in the areas of education, legislation, and technology with consideration of the corresponding technological, economic, and social consequences.
Fall and spring, 3 credits

CEN 582 The Science in Science Fiction
The course examines 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 are compared to assess how well science fiction predicts future technologies. Video and film versions are compared to written stories to see how (and if) the story and scientific emphasis are changed.
3 credits

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

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.

Sullivan, Amy, 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.

Assistant Professors

Baldwin, Philip, M.F.A., 1987, Yale University: Scene design; interactive media; cultural studies.

Kassel, Paul, M.F.A., 1983, Florida State University/Asolo Conservatory: Acting.

Mayo, Deborah, M.F.A., 1973, Yale School of Drama: Acting.

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: Playwrighting; theatre for children; dramatic criticism; Italian Renaissance drama.

Rosen, Carol[2], Ph.D., 1975, Columbia University: Dramatic theory and criticism; dramaturgy; comparative modern drama.

Number of teaching, graduate, and research assistants, fall 2003: 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.
Prerequisite: Admission to graduate program
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.
Prerequisite: Permission of instructor
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.
Prerequisite: Permission of instructor
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

THR 511 South and Southeast Asian Theatre and Drama

Theatre forms beyond the Western tradition, including ritual drama, Asian classical forms, and recent developments. Course is centered around a theme, and includes both survey materials and supplementary readings.
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 Far Eastern Theatre and Drama

Course surveys major forms of Asian theatre–Sanskrit drama, Noh, Kabuki, Beijing opera, and selected forms of folk and modern

theatre–focusing on themes of gender, political and social issues, death and dying, love, etc.
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.
Prerequisite: Permission of instructor
Fall or 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.
Prerequisite: Permission of instructor
Fall and spring, 1-3 credits, ABCF grading
May be repeated for credit

THR 535 Theories of Theatre
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 the final paper.
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.
Fall or 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.
Fall or 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.
Fall or 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 once for credit

THR 640 Theatre Design Workshop
Advanced assignments in theatre design. May include design work on departmental productions.
Prerequisite: Permission of instructor
Fall, 3 credits, ABCF grading
May be repeated once for credit

THR 650 Playwrighting 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.
Prerequisite: Permission of instructor
Fall or 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.
Prerequisite: Permission of Instructor
Fall or spring, alternate years, 3 credits, ABCF grading
May be repeated once 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.
Fall or 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.
Prerequisite: Permission of Graduate Studies Director
Fall or 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 Artsitic 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.
Fall and 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.
0 credits, S/U grading

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.
0 credits, S/U grading

Women's Studies (WST)

Interim Chair: Eduardo Mendieta, 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 a teaching practicum 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 member. 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.

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.

Charnon-Deutsch, Lou, *Hispanic Languages and Literature.* Ph.D., 1978, University of Chicago: 18th- and 19th-century Spanish literature; feminist theory.

Kaplan, E. Ann, *English and Humanities Institute.* Ph.D., 1970, Rutgers University: 19th- and 20th-century British and American literature; women's studies; film.

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.

Oliver, Kelly, *Women's Studies and Philosophy.* Ph.D., 1987, Northwestern University: Feminist theory; 20th-century French philosophy.

Rosen, Carol, *Theatre Arts.* Ph.D., 1975, Columbia University: Theory; criticism; modern drama.

Rosenthal, Joel, *History.* Ph.D., 1963, University of Chicago: Medieval Europe; England; social history.

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.

Wright, Patricia, C., *Anthropology.* Ph.D., 1985, City University of New York: Primate behavior and ecology; rainforest conservation; Madagascar.

Associate Professors

Anshen, Frank, *Linguistics.* Ph.D., 1968, New York University: Sociolinguistics; morphology.

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 Carribean literature; creative writing; women's studies.

Hong, Young-sun, *History.* Ph.D., 1989, University of Michigan, Ann Arbor: Modern Germany; social theory; culture and politics in Modern Europe; gender history.

Huddy, Leonie, *Political Science.* Ph.D., 1987, University of California, Los Angeles: Political psychology; public opinion; women in politics.

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.

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.

Trigo, Benigno, *Hispanic Languages.* Ph.D., 1992, Yale University: Turn-of-the-century Spanish American literatures; modernism; literary theory.

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.

Wilson, Kathleen, *History.* Ph.D., 1985, Yale University: Modern British history; 18th- and 19th-century social and cultural history.

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.

Diedrich, Lisa, *Women's Studies.* Ph.D., 2001, Emory University: Feminist bioethics; disability studies; feminist theory; psychoanalysis.

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.

Hutner, Heidi, *English.* Ph.D., 1993, University of Washington: 17th- and 18th-century British literature; women writers; colonial discourse; feminist theory.

Lagos, Cora, *Hispanic Languages.* Ph.D., 1997, University of Michigan, Ann Arbor: Colonial Latin American literatures; testimonial narratives; Caribbean literature.

Lim, Shirley, *History.* Ph.D., 1998, University of California, Los Angeles: U.S. social and cultural history; race, ethnicity, and gender history; popular culture.

Lecturers

Alfonso, Doris Rita, *Postdoctoral Fellow, Philosophy.* Ph.D., 2001, Stony Brook University: Ancient philosophy; contemporary French philosophy; feminist theory.

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, *Social Sciences Interdisciplinary.* 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 graduate 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.
Prerequisite: Permission of instructor
Fall or 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.
Fall or 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.
Fall or 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.
Prerequisite: Permission of instructor
Fall or 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 modem 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.
Prerequisite: Admission to the Graduate Certificate Program in Women's Studies
Fall or 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.
Prerequisite: Admission to the Graduate Certificate Program in Women's Studies
Fall or 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.
Fall or 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
Fall or 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
Co-requisite: Completion of the requirements for the Graduate Certificate in Women's Studies
Spring, 3 credits, ABCF grading

Writing and Rhetoric (WRT)

Director: Kay Losey, (631) 632-7390
Associate Director: Anne Beaufort, (631) 632-7726
Staff Assistant: Norma Porras, (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. Teachers with an M.A. degree or Ph.D. 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. 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.

Losey, Kay, *Program in Writing and Rhetoric.* Ph.D., 1992, University of California, Berkeley: Rhetoric and composition; literacy studies; bilingualism and writing; qualitative research methods.

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.

Losey, Kay, Director, Program in Writing and Rhetoric, Stony Brook University.

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

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

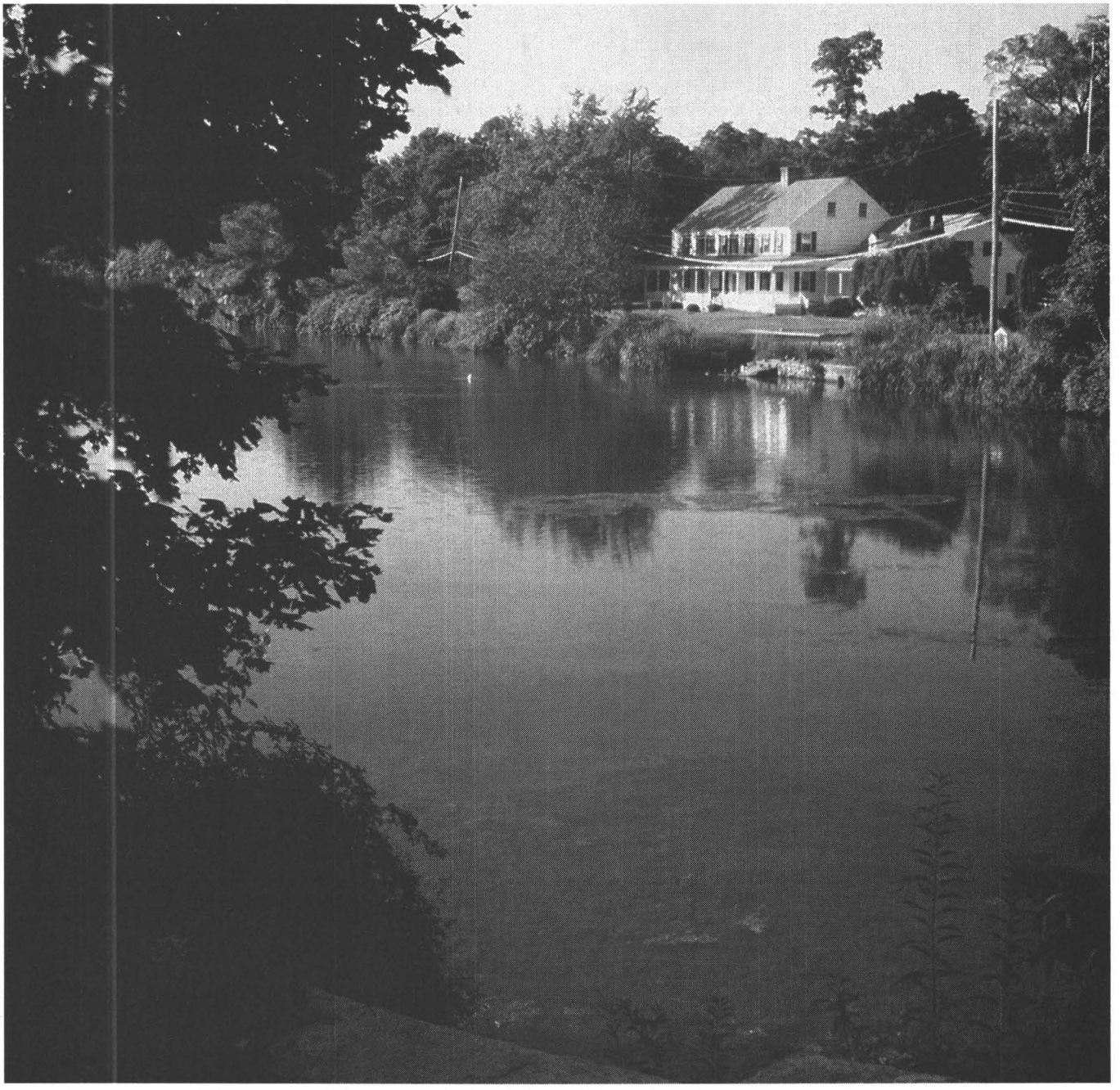
WRT 612 Theories in Composition
This course explores the relationship between reading and writing skills, the differences between speech production and writing production, and the relationship between literacy, culture, and language politics.
Prerequisite: Enrollment in the English M.A., Ph.D., M.A.T., or Composition Studies Certificate programs
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 M.A., Ph.D., M.A.T., or Composition Studies Certificate programs
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 M.A., Ph.D., M.A.T., or Composition Studies Certificate programs
3 credits, ABCF grading
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



The lush tranquility of Long Island's north shore lies well within walking or biking distance of campus.

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, 2004.

Richard T. Nasti, Chairperson

John J. Corrado

Robert H. Flynn

John C. Gallagher

Karan Kumar

Frank Petrone

Michael Russell

Angeliki Field-Pollatou

Officers of Administration

All positions listed as of June 1, 2004.

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Robert McGrath, Provost and Executive Vice President for Academic Affairs

Norman H. Edelman, M.D., Vice President of the Health Sciences Center and Dean of the School of Medicine

Gail Habicht, Vice President for Research

Frederick R. Preston, Vice President for Student Affairs

Bruce Schroffel, Executive Director and CEO of Stony Brook University Hospital

Yacov Shamash, Vice President for Economic Development and Dean, College of Engineering and Applied Sciences

Karol Kain Gray, Executive Director of the Stony Brook Foundation

Frances Brisbane, Dean, School of Social Welfare

David Conover, Dean and Director, Marine Sciences Research Center

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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

Olufemi Vaughan, Associate Dean for Underrepresented Student Affairs

Rita Nolan, Associate Dean for Academic Affairs

Kent Marks, Assistant Dean for Admissions and Records

Barbara Byrne, Assistant Dean for Finance and Budget

Phyllis Brenna, Assistant for Underrepresented Student Affairs

Monica Gentile, Assistant for Admissions and Records

Marilyn Miller, Assistant for Admissions and Records

Jennifer Showalter, Graduate Admissions Support

Meredith Ash, Receptionist

International Services

Elizabeth Barnum, Assistant Dean for International Services

Thomas Burns, Advisor to International Students and Scholars

Nancy Lannak, Advisor to International Faculty and Scholars

Kevin Sorrentino, Advisor to International Students and Scholars

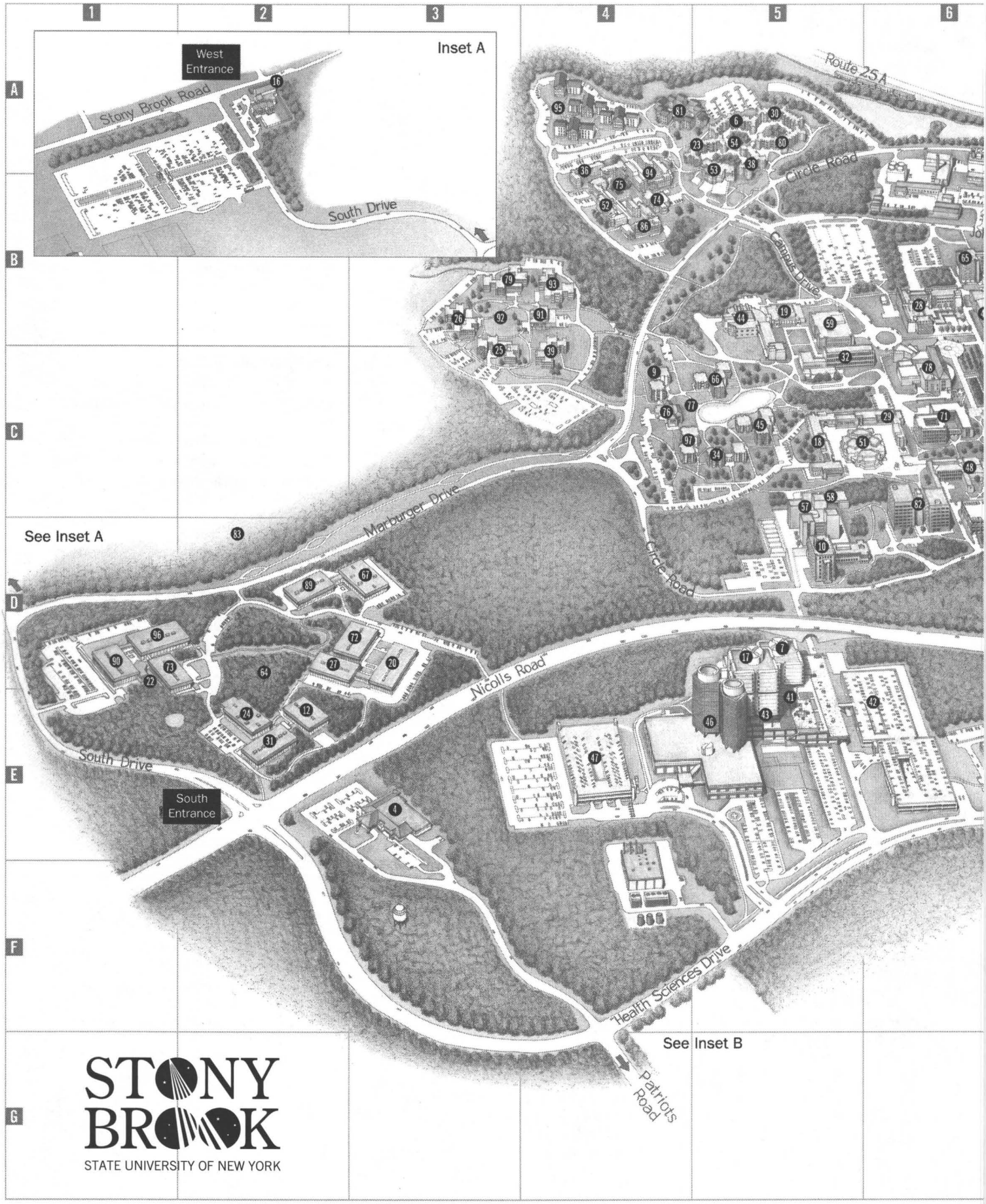
Lisa Schlotterhausen, Advisor to International Students and Scholars

Elsy Arieta-Padro, Advisor to International Students and Scholars

Joseph Carranza, International Services Staff Assistant

Luisa Escandon, International Services Staff Assistant

Emily Ntia, International Services Secretary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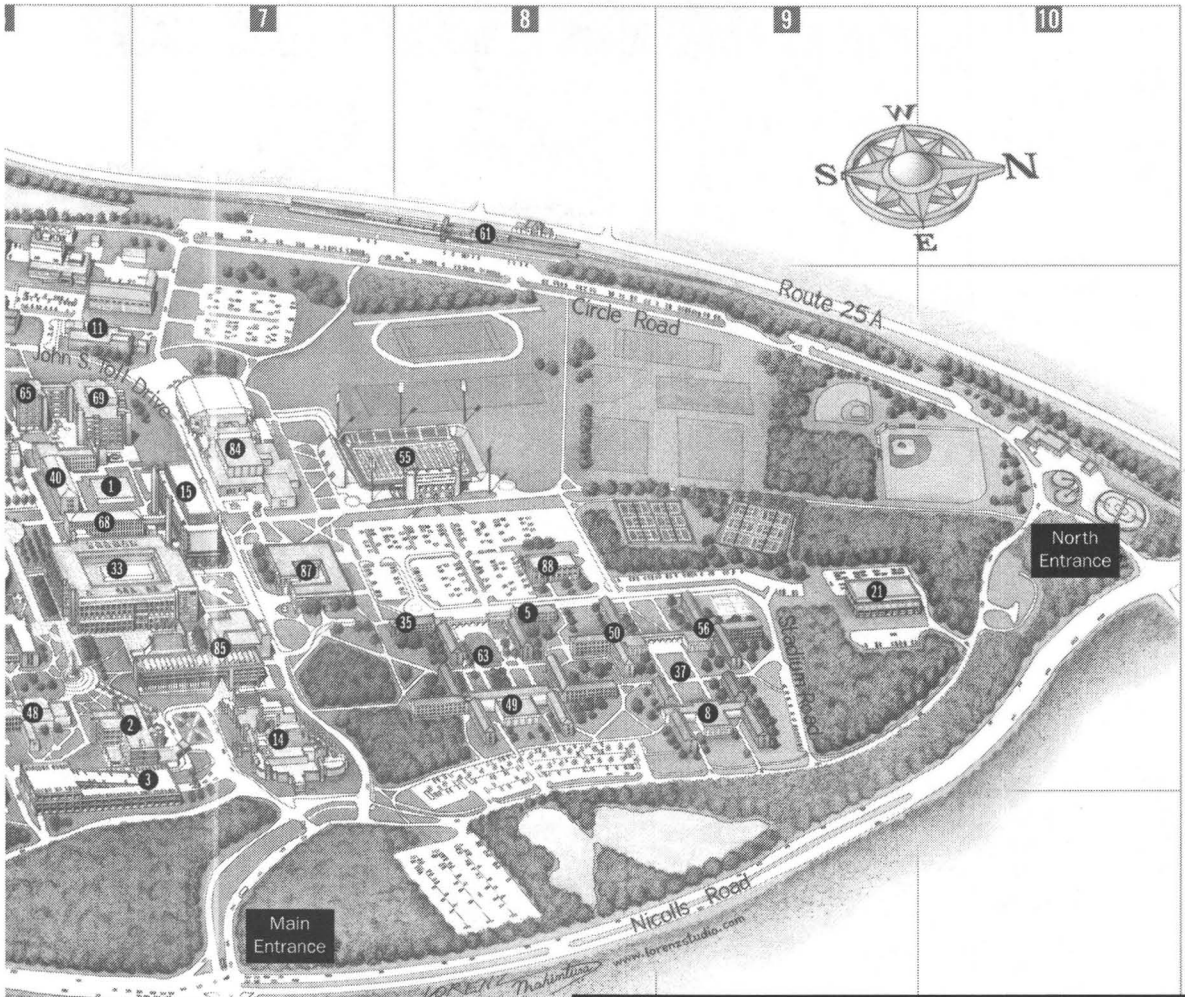
STONY BROOK
STATE UNIVERSITY OF NEW YORK

Campus Map



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***Residence Hall*
***Admissions Office, Admin.118*

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.

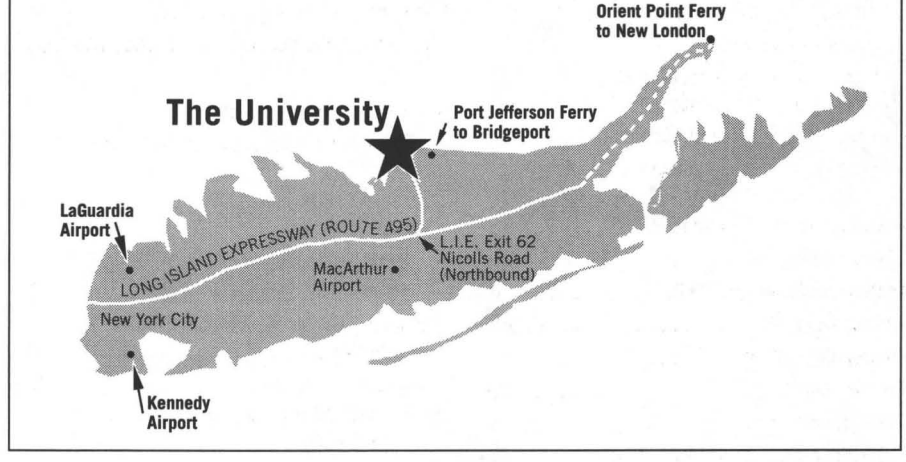
By Train
From Penn Station in Manhattan, take the Long Island Rail Road's Port Jefferson line to Stony Brook (631-231-LIRR). Cross tracks for campus bus.

By Bus
Call Suffolk County Transit (631-852-5200) for schedules, rates, and routes for buses to campus from many local towns.

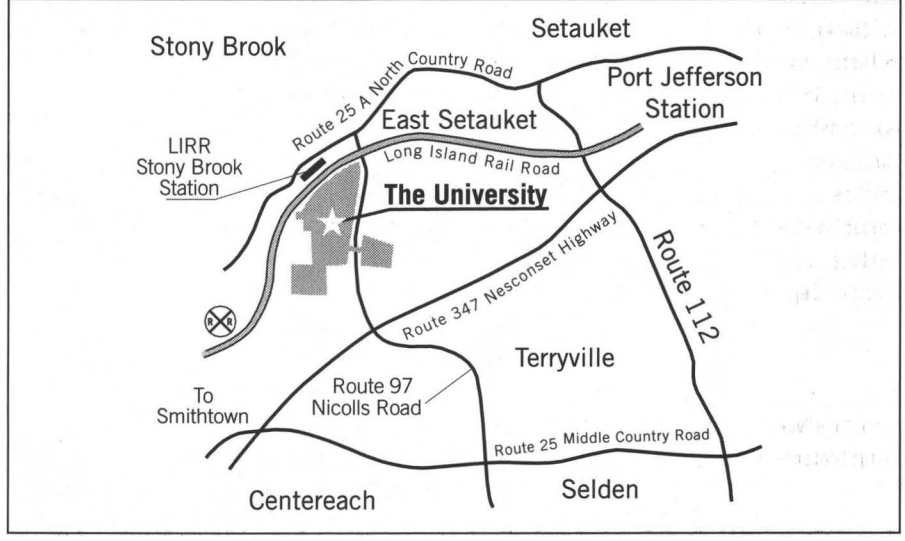
By Air
Land at Kennedy or LaGuardia airports, 50 miles west of campus, or at Long Island MacArthur Airport (631-467-3210), ten miles south of campus. All airports offer limousine and taxi service to campus. In addition, AirTrain JFK transports passengers between Kennedy Airport and Long Island Railroad trains (which go directly to campus), New York City Transit subways, and local buses. For more information, visit *www.panynj.gov/airtrain*.

The Region

Long Island



University Area



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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.)
BNB	Neuroscience	**HIS**	History
BSB	Biochemistry and Structural Biology	**HWC**	Social Welfare
CHE	Chemistry	**IDC**	Inter-University Doctoral Consortium
CLP	Clinical Psychology	**IEP**	International Exchange Program
CLT	Comparative Literature	**ISE**	Information Systems
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 (formerly MAR and OCN)
DLL	D.A. in Foreign Language–Language Learning	**MAT**	Mathematics
DLR	D.A. in Foreign Language–Russian	**MCB**	Molecular and Cellular Biology
DLS	D.A. in Foreign Language–Spanish	**MEC**	Mechanical Engineering
DLT	D.A. in Foreign Language–TESOL	**MGT**	Harriman School
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
GER	Germanic Languages and Literature	**WST**	Women's Studies

For a list of School of Professional Development codes, consult the SPD Graduate Bulletin.

THE UNIVERSITY WITH A MIND OF ITS OWN

STONY BROOK
STATE UNIVERSITY OF NEW YORK